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# **ART AND DESIGN**

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## Research on the design of traditional small wooden tools in the Central Plains of China

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**Abstract.** This research aimed to systematise traditional small wooden tools of the Central Plains of China in order to determine their cultural significance and to explore the interdependence between traditional creativity and modern design. The study was based on historical and cultural analysis and involved a systematic and interdisciplinary approach. The methods employed included literature review, art historical and cultural analysis, and archaeological classification techniques. From a design perspective, both qualitative and quantitative research methods were used to collect data and examine traditional small wooden tools in the Central Plains. Building on previous studies, the design principles and methods inherent in these tools were clarified, and the dialectical relationship between structure and function in form design was established. The study focused on the combination of materials used in traditional small wooden tools in light of advancements in science and technology. The factors influencing the development of the shape and size of these tools, as well as the ways in which they can be integrated into contemporary design, were identified. The design principles and methods refined from traditional small woodwork tools include: the dialectical relationship between structure and function; the prioritisation of functionality and the modular design concept; the emotional design approach; a design philosophy that highlights the expressive qualities of materials and the integration of new technologies; and a human-centred approach incorporating safety and customisation. Investigating the design heritage of small wooden tools not only contributes to the preservation of traditional culture but also facilitates the incorporation of its elements into modern practice by merging historical forms with contemporary technologies and materials

**Keywords:** Chinese traditional culture; creative concepts; design inspiration; innovative design; artefacts

### INTRODUCTION

By the early 21<sup>st</sup> century, woodworking had become heavily industrialised, leading to a loss of the traditional warmth and personal connection once associated with handcrafted wood products. Traditional Chinese woodworking tools combined practical functions with significant cultural values, embodying aesthetic standards and cultural norms. This study focuses on traditional small wooden tools from the Central Plains region of

China, examining their development and underlying design principles.

Recent research defines these small wooden tools as hand-powered woodworking implements used for crafting doors, windows, and furniture, distinct from larger structural carpentry tools (Hu *et al.*, 2024). Traditional Chinese carpentry historically categorised tools into “large woodwork” for structural projects and

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“small woodwork” for furniture and detailed crafts. As early as the Song dynasty (960-1279 CE), texts recorded distinctions between large-scale tools and small woodworking tools (Xidong, 2023). During the Qing dynasty (1636-1912 CE), these smaller tools were classified under decorative carpentry, explicitly covering furniture and interior woodworking. Scholars have extensively analysed traditional woodworking principles as resources for contemporary design innovation. For example, W. Hu *et al.* (2024) enhanced traditional Chinese furniture joints through experimental and numerical methods, improving mechanical strength and production efficiency. They also summarised ecological concepts in the design of traditional wooden furniture, providing new references and ideas for the sustainable development of modern wooden furniture.

Some scholars, such as H. Ni (2024), have approached the subject from the perspective of materials and processes, exploring the reasons why ancient artefacts continued to flourish and proposing a framework for realising traditional artefact culture in the production of modern goods. Y. Chen (2024) explored the integration of traditional woodworking techniques with digital restoration technologies, demonstrating potential avenues for preserving cultural heritage while advancing technological innovation. Additionally, G. Xue *et al.* (2024) emphasised sustainable cultural development strategies in traditional Ming-style furniture, highlighting the importance of incorporating historical forms, structures, and aesthetics into contemporary design. Contemporary researchers such as L. Xia *et al.* (2024), Y. Lou (2024), and M. Zhang & L. Jia (2024) have further explored how classical design philosophies inspire regenerative design concepts through the study of ancient texts related to artefacts, production, and craftsmanship. These efforts help translate traditional craftsmanship methods into modern practices. Studies by Y. Sun *et al.* (2022) have demonstrated how features of ancient ritual objects can inform contemporary product design. Y. Shen (2021) examined the patterns and evolution of woodworking tools from a process-oriented perspective. Q. Wang (2024), by contrast, focused on the Neolithic period to explore the concept of artefacts in the early stages of human civilisation – work that contributes significantly to understanding the broader Chinese artefactual cultural system. Likewise, Q. Li (2022) applied traditional woodworking principles to sustainable lighting designs, emphasising ecological and aesthetic considerations in product development. In addition to research on the connection between traditional artefact culture and modern design, recent studies have also investigated how digital technologies can enrich the dissemination of traditional woodworking culture (Shen, 2024). For traditional small woodworking tools, there exist both abstract bodies of knowledge and tangible artefactual studies, but most research stops at this point. It merely presents the design

concepts of traditional artefacts, while neglecting an understanding of the artefacts after their inheritance – a crucial aspect in preserving and extending their vitality and value. Therefore, exploring the modern value of traditional artefacts through their transformation into contemporary design holds essential significance.

This research aimed to bridge historical woodworking knowledge and contemporary design practice. Specific design principles and concepts inherent in traditional small wooden tools were identified and proposed as guidelines for modern design, ensuring the preservation and innovative adaptation of traditional craftsmanship.

## MATERIALS AND METHODS

This study employed a multidisciplinary approach that integrated design, statistics, anthropology, archaeology, sociology, and the history of technology. A combination of qualitative and quantitative methods was adopted to comprehensively investigate the design principles of traditional small wooden tools. These methods were selected to uncover both the cultural significance and technical characteristics of the tools. The sequence of the study was designed to correlate logically with the results obtained.

A systematic literature review was conducted to collect and synthesise relevant historical documents and recent academic publications. This review established the theoretical foundation and provided contextual data. Field investigations were carried out in traditional woodworking workshops and through interviews with craftsmen. Observations of physical objects and production processes were recorded, and supplementary data were obtained from reliable online sources. The collected data were classified, synthesised, and analysed to identify inherent design principles and cultural significance (Jiang, 2020). The procedures followed standard qualitative research methods as documented in earlier studies.

Quantitative methods were employed to measure and statistically analyse key indicators such as tool dimensions, material properties, and operational efficiency. Representative cases of traditional small wooden tools were purposefully selected for detailed study (Shen, 2024). Measurement indicators included size, weight, material density, and other parameters relevant to tool performance. Statistical analyses were performed to establish correlations between design features and functional outcomes. This analytical approach was grounded in established frameworks from the literature (Hu & Li, 2024).

## RESULTS AND DISCUSSION

### Dialectical relationship between structure and function

The analysis revealed that the dialectical relationship between structure and function played a pivotal role

in the design of traditional small wooden tools. Classic production tools were created with a balance between structure and function, and this study confirmed that the same structural configuration could serve multiple functions, while certain functions required a specific structure (Xidong, 2023). Field investigations and analytical methods applied in this research showed that the design of these tools was not arbitrary but followed principles that ensured both practical efficiency and cultural expression. In comparison with previous research, M. Jiang (2020) emphasised that traditional wooden tools not only performed utilitarian tasks but also conveyed deeper cultural meanings. In contrast, the current study demonstrated that the interplay between structure and function was clearly visible in how material choices and modular design concepts contributed directly to both tool performance and aesthetic appeal.

The study further revealed that the concept of modular design was integral to achieving an optimal balance between durability and adaptability. Y. Shen (2021) argued that the careful combination of materials in traditional tools was critical for ensuring stability while allowing for aesthetic variation. In the present analysis, it was found that modular design not only enabled tools to adapt to various tasks but also functioned as a mechanism for the transmission of cultural heritage. These results indicated that traditional artisans had developed a systematic method for integrating multiple functions within a single structural framework – a finding that supported and extended the conclusions drawn by M. Jiang (2020).

In addition to the Chinese context, international research has also explored the material culture of hand tools. Research conducted by Japanese scholars, as referenced in related studies, focused on the tangible attributes of tools to understand their cultural significance. However, those studies often lacked a systematic analysis of the underlying design principles. The present study addressed this gap by providing empirical evidence that the same design principles governing structural-functional relationships in Chinese tools could also be observed in foreign examples. This comparison underscored the universality of certain design concepts while also highlighting the unique cultural factors that influenced traditional Chinese woodworking.

### Classification of traditional small wooden tools

The study further classified traditional small wooden tools in the Central Plains into four functional categories. Cutting tools, including axes and saws, were identified by their robust designs suited to heavy-duty applications. Smoothing tools, such as various types of planes and shovels, exhibited refined craftsmanship, indicating their use in precision work. Carving and piercing tools, including chisels and drills, were noted for their versatility and delicate construction. Finally, measuring and alignment tools, encompassing instruments such as gauges, rulers, and related devices, were characterised by their accuracy and specialised design. B. Warholinski & A. Gilewicz (2022) had previously established a functional classification of woodworking tools, and the present study confirmed this categorisation through both qualitative observation and quantitative measurement. The empirical data supported the view that these categories were not arbitrary but reflected the inherent logic of traditional tool design, which prioritised both functionality and cultural expression.

In summary, the discussion integrated the results of structural analysis, cultural evaluation, and functional classification. The findings corroborated earlier research while offering new insights into the dynamic evolution of traditional small wooden tools. By comparing the present results with those reported by M. Jiang (2020) and Y. Shen (2024), the study demonstrated that traditional design principles were robust and had significant implications for modern design practices. This comparative analysis provided a clear framework for understanding how cultural heritage and technical functionality could be reconciled, thereby laying the groundwork for future research on the contemporary transformation of traditional artefacts. The findings align with broader international research trends, such as those by V. Strilets *et al.* (2021), who identified key patterns in furniture design development at the turn of the 21<sup>st</sup> century. They emphasised the importance of form-making and the reinterpretation of traditional elements in contemporary material culture. Similarly, the concept of ecological design in traditional Chinese furniture proposed by J. Hu & B. Li (2024) highlights a combination of philosophy, craft heritage, and functionality as the foundation of a sustainable design approach.

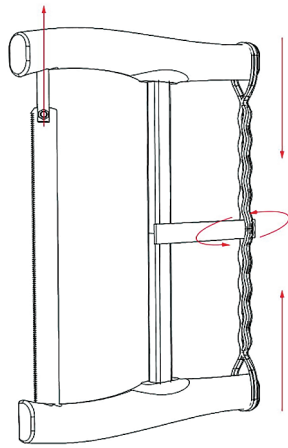


**Figure 1.** Functional classification of small woodworking tools

**Note:** a – tools for woodworking, b – flat wood tools, c – carving and piercing tools, d – measuring and orienting tools

**Source:** authors' photos based on Z. Li (2015)

With regard to the relationship between the structure and function of tools, W. Houkes & A. Meijers (2006) proposed two criteria for the ontology of technological artefacts: underdeterminism (UD) and realisation constraints (RC) (Meron, 2024). These encompass two key phenomena. One is structure-to-function, where the same structure can realise multiple functions. For example, the leverage principle is widely applied in traditional small wooden tools. The frame saw, for instance, uses its beam as a fulcrum to maintain the saw blade and the *biu tsi* rope in a state of balanced tension, ensuring the effectiveness of the sawing operation. Each component is detachable and contributes to the functionality of the tool, as illustrated in Figure 2.



**Figure 2.** Force analysis diagram of rope and saw blade

**Source:** drawn by the authors

The fact that the “soft” twine at one end is tightened to keep the “hard” saw blade at the other end taut reflects the ingenuity and empirical understanding of mechanical balance and material properties possessed by ancient designers. The second phenomenon is function-to-structure, whereby a single function can be realised through various structural forms. An analysis of traditional small wooden tools reveals that the fulfilment of a function does not rely on a single structural solution. For example, tools such as *jin*, *ji*, *zhen*, *chi*, and various planers differ significantly in structure and mode of operation, yet all serve the purpose of levelling wood. In contrast to UD, the RC phenomenon represents the relative rigidity of the relationship between structure and function – that is, a structure cannot perform all possible functions. This constraint underlies the classification of processes and tools in woodworking. Both UD and RC have distinct advantages. UD enables the optimisation of resources through multifunctional design, reflecting an environmentally conscious design philosophy. Conversely, RC enhances the specialisation and hierarchical organisation of tools, improving their functional efficiency and clarity of use.

### The essential embodiment of morphological design

First, the function determines form. In the traditional handicraft industry, woodworking itself is categorised into large-scale carpentry, small wooden tools, fine woodworking, round woodworking, and water woodworking, among others. These fields are wide-ranging, and the division of labour is a key characteristic. However, the tools used are largely similar, differing primarily in their dimensions and scale. In modern times, woodworking tools are numerous and diverse, with common types including saws, axes, planes, chisels, gauges, rulers, and inkwells. This rich and enduring system of tools has been passed down for thousands of years, owing to the craftsman’s close interaction with the tools. Priority is given to usability and efficiency – tools are refined and optimised primarily with functionality in mind. For instance, although planers may vary in shape and operational style depending on specific tasks, functionality remains the central and consistent design focus. According to a study by L. Xia *et al.* (2024), the evolution of tools reflects a growing understanding of the natural world. This “use-oriented” approach is the essence and core of traditional Chinese artefacts.

Second, the concept of nested design is central. Different structural optimisation strategies influence aspects such as material consumption, assembly forms, and recycling methods throughout a product’s life cycle. Historically, the Chinese were pioneers in employing modular systems on a large scale. A defining characteristic of small wooden tools used by carpenters is their combinatory structure – that is, they consist of multiple components related by material, function, or structural design. Regardless of these interrelations, such tools are always presented as part of a coherent and systematic whole. This modular logic is also evident in other traditional implements, including utensils, medical instruments, and farming tools. Traces of these production methods continue to influence modern product design, even in everyday objects found in 2025.

Finally, emotional design must be acknowledged. Ancient artisans created with the aspiration of a better life and this aspiration has been continuously expressed and developed through heritage. Y. Sun *et al.* (2022) observed that the form of artefacts not only embodies practical value but also reflects human consciousness and cultural values. Objects often serve as tangible expressions of the maker’s or owner’s identity and aesthetic preferences. Numerous sources document the enduring use of traditional woodworking tools. H. Ni’s (2024) study found that although tools such as the *Lu Ban* ruler, ink pot, planer, and frame saw are small in scale, they have remained in use for centuries. Their continued relevance is due not only to their functionality but also to their cultural symbolism, which resonates with the values of Chinese society. This human-centred and emotionally responsive approach to design has always existed in Chinese architecture and

craftsmanship and aligns with the principles of emotional design advocated in contemporary psychology.

### **Material and technical rationality**

The first principle is to emphasise the expression of the material itself. The role of materials in design can be summarised as practical function, aesthetic function, and emotional expression. Material selection is based on functional requirements, meaning that the materials used are chosen according to the specific purpose of the tool. Traditional small wooden tools are primarily made of wood, with working parts reinforced by metal. This approach effectively leverages the functional properties of each material, combining the “softness” of wood with the “rigidity” of metal to achieve a balance of flexibility and strength in the design, thus maintaining the tools’ inherent stability and equilibrium.

The second principle is to explore the possibilities afforded by new technologies. According to T.J. Rivers (2022), the essence of technology lies in pushing the “limits of method”, and it begins to explain the evolution of human culture through the development of tools as representations of technological advancement. In other words, the history of human civilisation mirrors the development of tools. Traditional small wooden tools are typical production implements that span the Palaeolithic, Neolithic, Bronze, and Iron Ages – each period introducing new technologies and materials that significantly influenced the performance and efficiency of such tools. During the Palaeolithic era, natural objects such as stones, wood, animal bones, shells, and mussels were intentionally shaped to produce sharp ends suitable for gripping (Kim & Seo, 2024). In the Neolithic period, tools remained predominantly stone-based (Shen, 2021), though materials such as wood, bone, mussels, pottery, shells, and metals were also introduced. Composite tools emerged, constructed from multiple materials and connected through bindings or mortise-and-tenon joints. The use of handles facilitated striking, grinding, and drilling, marking a major leap in technological and cultural development. By the late Western Han dynasty, society had entered the iron age – a clear watershed moment. As iron smelting advanced, tool components such as saw blades, planer blades, and drill bits became sharper and more refined. This transition brought about qualitative changes in the performance of small wooden tools, enhancing their function and enabling more precise categorisation and application. These innovations reduced material waste and refined the processing of objects. Technology and society, both centred on tools, together form an intricate and interdependent network – mutually reinforcing and co-evolving to support the creation of a stable and harmonious world.

### **A human-centred view of creation**

The principle of people-oriented design was articulated as early as ancient China (Guanzi, 2015). Objects should serve people, not the other way around – that is, one

should use things without being burdened by them. This concept has long stood as the core of the human relationship with material culture. Similarly, while all tools are hand-operated, the variation in grip styles and the direction of applied force significantly influence the curvature and design of tool handles. The user-friendliness of traditional small wooden tools is evident not only in their compatibility with human body proportions but also in their functional convenience. A single tool may be adapted for multiple purposes, with the most notable example being the modular design method previously discussed. In line with human tendencies to rely on familiar tools, such a model undoubtedly reduces the need for re-adaptation. Fewer tools also make transportation more efficient and less labour-intensive.

Within the concept of customised design, traditional small wooden tools – as artefacts shaped by human intent – are significantly influenced by human agency (Lou, 2024). These tools were almost always handcrafted by carpenters for their own use, which, in contemporary terms, aligns with the idea of customised or bespoke design. Addressing the relationship between personalised craftsmanship and large-scale industrial production, and determining how to preserve human-centred values in an era defined by speed and efficiency, remains a pressing challenge in both society and industry.

### **Continuation of structural functions**

The types and functions of traditional small wooden tools continue to influence modern woodworking, which can broadly be divided into integrated and handmade processes. Many modern small tools retain traditional structural or functional characteristics, while also adapting to contemporary needs through improvements in power and technology. The snail tape measure – whose form resembles that of the traditional inkwell – uses a coiled spring mechanism around a central axle. The ruler still extends and retracts via a pulling motion, but now includes updated ruler surfaces incorporating various measurement systems such as the centimetre scale, Dinglan ruler, Luban ruler, and table ruler. This tool effectively integrates the features of the inkwell and Luban ruler into a single compact, lightweight, and portable device (Kroes, 1998; Jiang, 2020). It not only preserves the wisdom embedded in traditional tools but also accommodates multicultural measurement systems, thereby meeting the needs of a wider range of users. The continuation of traditional tools’ functions and working principles is a vital path for future development (Zhang & Jia, 2024). For example, the modern reciprocating saw consists of a main body, handle, battery, switch, chuck and saw blade. Its working principle is essentially the same as that of the traditional frame saw: the object is cut via a reciprocating blade movement. In traditional designs, this motion was powered manually; modern versions use mechanical components driven by gears to operate a telescopic rod. With a stroke distance of 15 mm and powered by

electricity, the saw's cutting capacity is greatly enhanced, and the frequency of blade movement is significantly increased. Reciprocating saws are used not only by carpenters but also as versatile tools across various fields. By changing the saw blade via the collet mechanism, it is possible to cut through metal, wood, plastic, stone, and other materials, thereby significantly broadening their range of applications.

**Power evolution and innovations in tool materials**

From the perspective of technological development within society, the dominant power sources have evolved over time. In the primitive and agricultural periods, manpower and animal power were the primary means of operation. During the industrial era, steam power became prevalent. In information society – characterised by rapid scientific and technological advancement – numerous new technologies have emerged. These advancements primarily involve the widespread use of electric power, internal combustion engines, and

innovations in transportation and communication technologies. Currently, electric and petroleum-powered tools dominate, with renewable energy sources serving as complementary options. As part of the transition towards ecological civilisation, the future focus will be on the development of environmentally friendly energy sources, in response to low-carbon and sustainable development goals. This evolution in power technologies underscores how science and technology are powerful drivers of social progress. Modern small wooden tools have evolved from manual operation to electric-powered devices, such as electric saws, power planers, electric drills, laser levels, and electronic precision measuring instruments.

Traditional small woodworking tools were made from a range of materials, including wood, stone (including jade), metals (such as bronze, copper, and iron), and composite materials. The material classification system is illustrated in Figure 3.



**Figure 3.** Material classification system for small wooden tools

**Note:** a – wood type, b – stone type, c – metal type, d – mixed material class

**Source:** authors' photos based on Z. Li (2015)

The technical level of tool design has improved continuously over time. Material use represents the optimal expression of technology. In selecting materials for tools, two core principles are generally followed: choosing the most appropriate material based on function, and keeping pace with the times through the adoption of innovative materials. This requires designers not only to be familiar with various materials but also to possess a forward-looking understanding of technological trends. The dual nature of the tools – being both functional and symbolic – increases the complexity and specificity of material selection. Fully understanding and utilising material properties is a challenging task, but it is a critical factor in a tool's ability to remain competitive in the market.

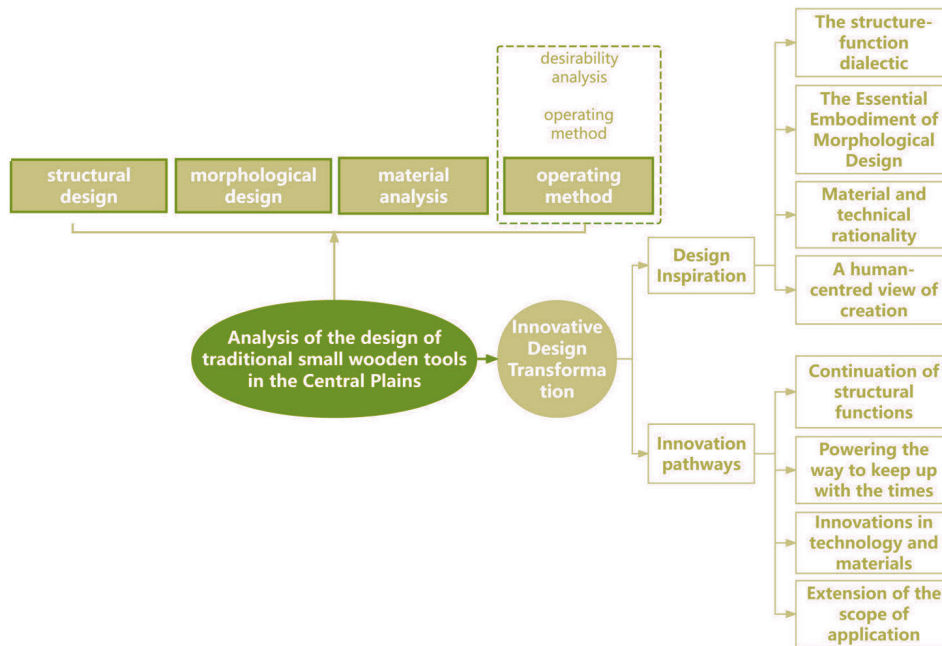
**Extension of application scope**

With the popularisation of technology, the application scope of traditional small wooden tools has continued to expand, particularly in terms of user demographics and contexts of use. Traditional small wooden tools were once exclusively used by carpenters, who were

typically the only group to possess a full set. However, as of 2025, the revival of traditional culture has led to a gradual increase in individuals engaging in woodworking as a hobby or profession. Compared to earlier generations, the demographic profile of modern woodworking enthusiasts is increasingly youthful. Many founders of contemporary woodworking studios are young people. Some are university teachers guiding students in the creation of handcrafted wooden items; others are descendants of traditional carpenters, engaging in woodworking to preserve family craftsmanship. Additionally, there are experiential workshops aimed at nurturing children's creative thinking and practical skills. Preserving tradition requires adapting it to the pace of contemporary life. Traditional skills and tools must be transformed into a dynamic and youthful force. The continued vitality of tradition depends on the innovations brought by younger generations. As small wooden tools undergo changes in technology and materials, their use has expanded from exclusively processing wood to also accommodating metal, plastic,

stone, and other materials. For example, electric drills, thanks to their durable drill bits and sufficient power have become essential not only for woodworking but also for everyday tasks such as drilling and screw

driving. In this way, tools have undergone a transformation from specialist to general-purpose use, shedding their exclusive identity and achieving greater functional versatility. The innovation path is illustrated in Figure 4.



**Figure 4.** Analysis of the design of traditional small wooden tools

**Source:** compiled by the authors

Innovation in design involves modernising traditional forms by integrating them with contemporary needs and aesthetics while retaining culturally significant elements. This process requires selecting and adapting traditional features that continue to hold relevance today. In particular, features that embody the spirit of the current era deserve closer examination and careful preservation. Through an analysis of traditional small wooden tools from Central China, focusing on both their historical evolution and their relevance to modern design, this study demonstrates that many underlying principles remain valuable. By merging traditional concepts with modern design strategies, new possibilities emerge for the evolution of these tools. This research proposes practical methods and strategies for transforming traditional designs into innovative products that align with the demands of contemporary society.

## CONCLUSIONS

This study found that traditional small wooden tools in the Central Plains exemplify a distinct balance between structure and function, developed through centuries of practice. The analysis demonstrated that the integration of modular design, material properties, and cultural symbolism enhanced both the tools' practical efficiency and their aesthetic value. Qualitative field investigations and quantitative measurements revealed

that traditional artisans employed resource-sharing strategies to optimise functionality while preserving cultural heritage. Specifically, the research analysed how the dialectical relationship between structure and function was achieved through design elements that enabled a single structure to serve multiple functions, as well as how different structures could realise the same function. These findings support the view that key traditional design principles – such as modular configuration and the interrelation between material expression and mechanical performance – can serve as effective guides for contemporary design practice. Furthermore, the study demonstrated that experiential design strategies, which emphasise user interaction and cultural context, can be effectively applied to modern design challenges. By establishing a bridge-building approach between traditional methods and modern technology, the research provided a clear framework for integrating historical craftsmanship into current design processes. Future research should focus on developing and testing new design prototypes based on these traditional principles, as well as conducting comparative studies in different cultural contexts to further explore their applicability to modern innovation. This research thus not only enriches the understanding of traditional woodworking tools but also lays the groundwork for their revitalisation in contemporary society.

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## CONFLICT OF INTEREST

There is no conflict of interest in this study. All authors have read and approved this version of the article, and due care has been taken to ensure the integrity of the work. Neither the entire paper nor any part of its content has been published or has been accepted elsewhere. It is not being submitted to any other journal.

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## Дослідження дизайну традиційних малих дерев'яних інструментів на Центральних рівнинах Китаю

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**Анотація.** Це дослідження мало на меті систематизувати традиційні малі дерев'яні інструменти Центральної рівнини Китаю, щоб визначити їхнє культурне значення та дослідити взаємозалежність між традиційною творчістю та сучасним дизайном. Дослідження ґрунтувалося на історико-культурному аналізі та включало системний і міждисциплінарний підхід. Використані методи включали огляд літератури, мистецтвознавчий та культурний аналіз, а також методи археологічної класифікації. З точки зору дизайну, для збору даних і вивчення традиційних малих дерев'яних інструментів на Центральних рівнинах були використані як якісні, так і кількісні методи дослідження. Спираючись на попередні дослідження, було з'ясовано принципи та методи дизайну, притаманні цим інструментам, а також встановлено діалектичний взаємозв'язок між структурою та функцією в дизайні форми. Основну увагу приділено поєднанню матеріалів, що використовувалися в традиційних малих дерев'яних знаряддях праці, у світлі досягнень науки і техніки. Визначено фактори, що впливають на розвиток форми та розмірів цих інструментів, а також шляхи їх інтеграції в сучасний дизайн. Принципи та методи дизайну, запозичені з традиційних малих дерев'яних інструментів, включають: діалектичний зв'язок між структурою та функцією; пріоритет функціональності та модульну концепцію дизайну; емоційний підхід до дизайну; філософію дизайну, яка підкреслює виразні якості матеріалів та інтеграцію нових технологій; а також підхід, орієнтований на людину, що включає безпеку та індивідуалізацію. Дослідження дизайнерської спадщини малих дерев'яних інструментів не лише сприяє збереженню традиційної культури, але й полегшує включення її елементів у сучасну практику шляхом поєднання історичних форм із сучасними технологіями та матеріалами

**Ключові слова:** китайська традиційна культура; творчі концепції; дизайнерське натхнення; інноваційний дизайн; артефакти



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## Research on casual shoe pattern design based on shape grammar

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**Abstract.** This research investigated the integration of cultural elements from the Zhujiajiao bridges in Shanghai into casual shoe pattern design, employing shape grammar and the fuzzy evaluation method. The study focused on four iconic bridges – Release, Huimin, Chenghuangmiao, and Yong'an – extracting and redesigning their distinctive patterns to create a collection of decorative elements. These patterns were enhanced by a colour scheme inspired by the Jiangnan water town landscape. The research process comprised three steps: extracting bridge elements using design software, redesigning these elements based on shape grammar rules to generate pattern collections, and evaluating the patterns and colours using a fuzzy evaluation method with input from teachers and students. Shape grammar, defined as  $SG = (S, L, R, I)$ , was utilised to evolve initial bridge elements through various rules, resulting in three pattern sets ( $SG_1$ ,  $SG_2$ , and  $SG_3$ ). The colour scheme, characterised by neutral tones and contrasting hues, was developed by extracting colours from significant buildings in Zhujiajiao. Two colour schemes ( $C_1$  and  $C_2$ ) were created and matched with the pattern sets. Using the fuzzy evaluation method, these combinations were evaluated according to criteria such as usability, design characteristics and template attractiveness. The results revealed that the combination of patterns  $SG_1$  and  $SG_3$  with colour scheme  $C_2$  was the most preferred. These redesigned patterns and colours were successfully applied to casual shoe designs, resulting in visually appealing and culturally significant footwear. The study demonstrated the practicality of shape grammar in automating design processes for culturally creative products, enriching casual shoe designs with traditional bridge patterns while fostering appreciation of cultural heritage in contemporary fashion

**Keywords:** Zhujiajiao bridge cultural elements; traditional pattern integration; cultural inheritance; Chinese culture; modern footwear; fashion; graphic design

### INTRODUCTION

As of 2025, there has been a heightened focus on integrating traditional cultural elements into contemporary designs, particularly in the field of fashion. This study is especially timely and relevant as it explores the incorporation of cultural motifs from the iconic Zhujiajiao bridges in Shanghai into casual shoe pattern designs, utilising shape grammar and fuzzy evaluation methods

to enrich modern footwear with traditional aesthetics and to foster an appreciation of cultural heritage. Previous research on pattern design and shape grammar has primarily focused on four key areas. According to L. Bu *et al.* (2023), reflecting the local characteristics of ancient towns in order to achieve differentiated competitiveness has become a significant issue in the

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development of culturally and creatively themed ancient towns. Earlier studies related to pattern design and shape grammar fall into the following categories: The first concerns the application of shape grammar in pattern reuse and optimisation. Shape grammar, as a powerful design tool, has demonstrated considerable potential in this area. A. Caetano *et al.* (2020) discussed computational design (CD) and proposed an improved and robust classification method based on traditional shape grammars for key CD concepts, including parametric design. D. Chen & P. Cheng (2024) used first-order quantitative theory to establish a correlation model between shape grammar transformation rules in clothing pattern design and young people's image perceptions. Their research illustrated the mapping relationship and degree of influence on consumer preference through graphical methods. The second area was the exploration of computational design within architectural design. With the rapid advancement of digital technology, computational design has seen increasingly widespread application in this field. N. Ding *et al.* (2020) defined and applied concepts of parameterisation, generation, and algorithmic design in architecture, offering a theoretical foundation for the digital and intelligent transformation of pattern design. This trend was driving architectural practice towards greater efficiency, flexibility, and personalisation.

The third category involved the innovative application of traditional patterns in modern design. As an essential component of cultural heritage, traditional patterns have received increasing attention regarding their adaptation and innovation within contemporary design contexts. A series of studies have focused on the use of traditional patterns in modern design across different cultural contexts. N. Ding *et al.* (2020) extracted and analysed traditional furniture patterns, applying the shape grammar theory to derive core elements for new decorative patterns through evolutionary reconstruction, thereby enabling the morphological transformation and cultural continuity of traditional furniture designs. M. Kulińska *et al.* (2022) explore how body measurements are widely used and implemented in the digital design of traditional garments. Y. Xu & F. Xia (2024) employed shape grammar to extract and deduce the basic elements of Miao embroidery patterns in Wenshan, resulting in the creation of innovative designs. W. Huang (2023) selected typical Ruyuan Yao embroidery patterns for compositional analysis, deconstructs them into fundamental elements, and reconstructs these to form innovative base patterns. By applying shape grammar, these base patterns are developed into a series of unit innovations that are subsequently integrated into product design.

The fourth area concerns the application of shape grammar in automated and intelligent design. L. Zhang & Y.R. Xiao (2024) analysed the perceptual differences between residents and tourists regarding the

characteristics of ancient towns, examining the emotional responses these evoke and identifying influencing factors. E. Yilmaz *et al.* (2023), following the arrangement of intelligent microcapsules, utilise shape grammar to determine the pattern structure and design of a new sports bra, enhancing its aesthetic appeal. L. Gao & X. Li (2025) introduced topological geometry into product shape design, conducting hierarchical feature analysis of a target product prototype and identifying its form-defining characteristics based on topological weights. Primary features are constrained by topological properties, while secondary features are derived through shape grammar rules, ultimately generating an innovative product design scheme.

Ultimately, this study aimed to contribute to the revitalisation of traditional cultures through modern design practices, while also offering valuable insights into the application of shape grammar in pattern redesign.

## **MATERIALS AND METHODS**

The research process involved several key steps. First, four representative bridges in Zhujiajiao were selected as the subjects for pattern extraction. These bridges – namely, the Release Bridge, Huimin Bridge, Chenghuangmiao Bridge, and Yong'an Bridge – were chosen for their distinctive styles and historical significance. Through meticulous abstraction and line drawing, the basic elements of each bridge were extracted and subsequently reorganised into a cohesive pattern design. Next, the extracted patterns were further refined and transformed using shape grammar rules. It is worth noting that Adobe Photoshop was used in the study. This process involved applying various generative and modifying rules to the initial patterns, producing a range of variations that preserved the core characteristics of the original bridges while incorporating modern design elements. The refined patterns were then evaluated through a fuzzy evaluation method, which assessed their aesthetic appeal, cultural authenticity, and adaptability for footwear design. In order to illustrate the redesign of bridge culture, design software was employed to optimise the derived patterns through adjustments such as mask transparency, pattern layer overlays, and transparency locking. While retaining the original patterns and colours, this process enabled a more harmonious integration of bridge elements characteristic of the Jiangnan water town. In addition, a combination of product design techniques was applied to create patterns embodying the features of the water village. These culturally rich patterns were then incorporated into the design of casual footwear.

The pattern extraction and redesign process for Zhujiajiao was divided into three main stages. Firstly, four ancient bridges with distinctive stylistic features were selected as the basis for element extraction. Their line drawings were abstracted to obtain the defining features of water town bridge architecture. Based on

shape grammar, the extracted elements were arranged and integrated according to design principles to generate more complex, orderly, and decorative monolithic design elements. Subsequently, constraints and transformation rules were applied using graphic design software. The primary features of the original bridges were analysed in terms of points, lines, and surfaces. At the same time, unnecessary design elements were

harmonised or removed to form a comprehensive pattern set. Colour schemes were also developed based on real-life scenes. Finally, the fuzzy evaluation method was employed to refine the basic elements of the water town bridges, compare data, evaluate the pattern and colour collections, and determine the optimal combination for application in casual shoe design. The process is illustrated in Figure 1.

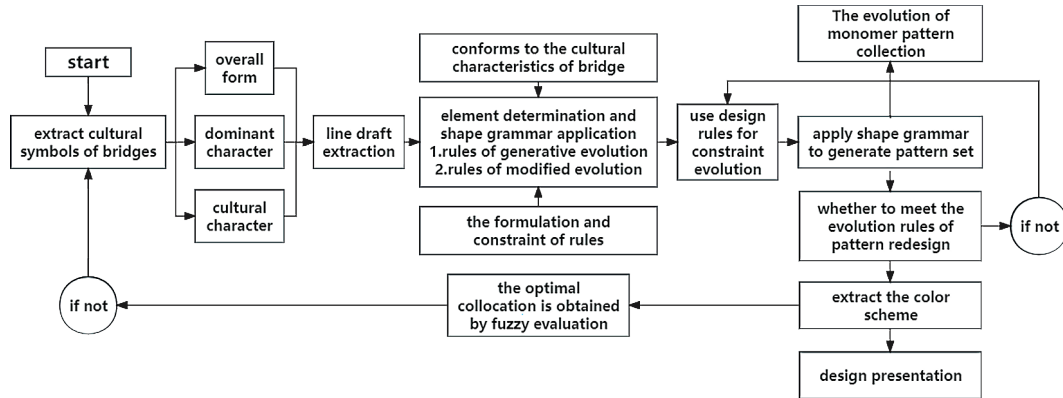


Figure 1. Flow chart of the study

Source: developed by the authors

The pattern system functioned as a design language integrating generative and modifying rules. Shape grammars served as modern computational tools that, once transformation rules were established, enabled the combination of basic forms, evolutionary commands, and novel, style-specific design outputs. The evolutionary rules of generative design allowed for creative development through the sequential application of multiple rule sets, resulting in a coherent and innovative design language.

According to the definition of shape grammar by G. Stiny & J. Gips (1971), it can be expressed as  $SG = (S, L, R, I)$ , where SG denoted the finite set of shapes resulting from the application of evolution rules; S represented the set of shapes derived through operations such as proportional transformation, rotation, mirroring, etc.; L referred to the finite set of markers; R was the finite set of inference rules for evolution; and I was the initial shape from which the inference process begins. In practical product shape inference, the initial shape corresponded to the target morphological curve. Evolutionary inference can be applied to part or all of these curves, with the optional use of shape markers. Affine transformations allow for arbitrary angular tilting and longitudinal scaling while maintaining co-linearity, co-pointing, and mutual parallelism. The corresponding operations include translation, scaling, rotation, and miscutting. Bézier curve transformation refers to stretching a curve through four control points while preserving affine and geometric properties. This study primarily applied evolutionary rule constraints, with modifying rules serving as the primary

mechanism and generative rules as a supplement. The aim was to ensure that the elements extracted from the target scenery retained the defining cultural characteristics of the bridges after undergoing transformation through the evolutionary reasoning process, as illustrated in Figure 2.

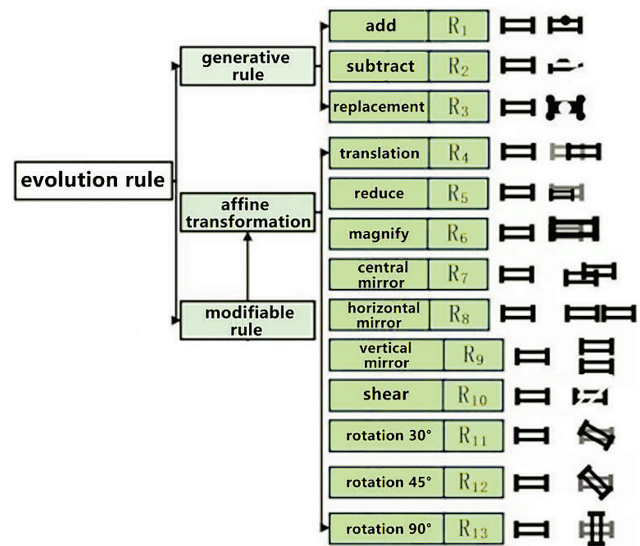


Figure 2. Evolution rule description

Source: developed by the authors

Evolutionary rules encompass design operations such as addition, subtraction, division, modification, replacement, deletion, scaling, mirroring, copying, rotation, and miscutting. As shown in Figure 3, a

design language can be derived from these fundamental operations and then applied to design objects. These rules demonstrated that shape grammar functions as a design methodology governed by the principles of arithmetic logic.

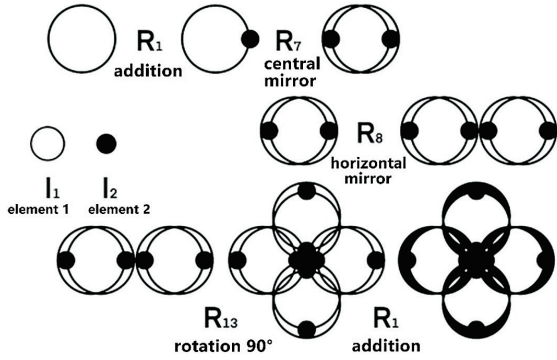


Figure 3. Scheme of rule instructions

Source: developed by the authors

To begin with, based on the principles of modelling and composition of basic elements, the initial shape of the pattern was extracted with careful attention to the monolithic modelling structure and the continuity of the subsequent design. The distinct elements required for the design were extracted using Photoshop 2024

and Procreate 5.3.4. These four basic elements were imported into Procreate, where, using a single-line brush, they were manipulated according to shape grammar: the first step involved retaining the original form of each initial element while incorporating new design features; the second step filtered and removed overly complex components to highlight each element’s distinctive characteristics; the third step applied modification instructions while preserving the structural skeleton of the original form, thereby generating alternative stylistic variations. The architectural outlines of the four historic bridges in Zhujiatiao were abstracted and simplified into line drawings, yielding four groups of basic elements:  $I_1$ ,  $I_2$ ,  $I_3$ , and  $I_4$ . While maintaining the distinctive features of the bridges, a degree of deformation was introduced using affine transformations and generative rules. These served as secondary evolutionary tools. The generative evolution rules enabled the preservation and enhancement of the bridges’ most distinctive design features.

RESULTS AND DISCUSSION

Characterisation of Zhujiatiao bridge elements

The extraction process of the bridge elements is presented in Table 1. Firstly, real-life images of the bridges were processed to extract features, and line drawings were generated using Adobe Photoshop.

Table 1. Characterisation and extraction of Zhujiatiao bridge elements

Feature refinement	Fangsheng Bridge - $I_1$	Yong’an Bridge - $I_2$	Chenghuangmiao Bridge - $I_3$	Huimin Bridge - $I_4$
Picture				
Line draft extraction				
Line abstraction				
Evolution of element 1	$R_2$	$R_2$	$R_2$	$R_2$
Evolution of element 2	$R_2 R_6$	$R_2 R_{10}$	$R_9$	$R_{10} R_1$
Evolution of element 3	$R_2 R_7$	$R_1$	$R_2 R_{13}$	$R_9$
Extraction result	New element - $T_1$	New element - $T_2$	New element - $T_3$	New element - $T_4$

Source: developed by the authors

As observed across the four groups of elements, the abstracted forms exhibit not only structural stability but also distinct stylistic features characteristic of Jiangnan water town architecture. The compositions primarily consist of quadrilateral and smooth, circular surface elements. Subsequently, generative evolutionary rule  $R_2$  was applied to amplify key features by selectively deleting components from the four structural groups ( $I_1$ ,  $I_2$ ,  $I_3$ , and  $I_4$ ), without compromising their skeletal morphology. These elements were then further refined and amplified, retaining their defining characteristics and adhering to rule-based constraints. During the feature refinement process, it was essential to apply modifiability rules to deepen shape derivation and produce more nuanced characteristic elements. To ensure alignment between the derived forms and the target design intentions, a combination of evolution rules – add ( $R_1$ ), enlarge ( $R_6$ ), vertical mirror ( $R_9$ ), and miscut ( $R_{10}$ ) – were applied alongside  $R_2$ . These helped optimise feature modelling under positional constraints. Finally,

additional rules, such as central mirror ( $R_7$ ), vertical mirror ( $R_9$ ), and 90-degree rotation ( $R_{13}$ ), were employed to further evolve the forms, resulting in the final new elements: ( $T_1 = R_2 + R_2 + R_6 + R_2 + R_7$ ), ( $T_2 = R_2 + R_2 + R_{10} + R_1$ ), ( $T_3 = R_2 + R_9 + R_2 + R_{13}$ ), and ( $T_4 = R_2 + R_{10} + R_1 + R_9$ ). These four evolved groups of elements successfully retain the modelling characteristics of the original bridges while also expressing a more structured and coherent formal style, contributing to the understanding of morphological principles and the preservation of visual rhythm.

**Evolution and redesign of foundation elements**

Building upon the refined elements described above, four sets of foundational forms were derived. These forms employed affine transformations under the modifiability rules, enabling arbitrary angular tilting, telescopic scaling, and rotational transformations while preserving co-linearity, common points, and parallelism. This approach facilitated the directional control and precision required in the subsequent redesign phase, as shown in Table 2.

**Table 2.** Transformation rules applied to foundational element evolution




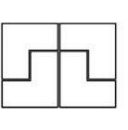



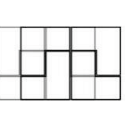

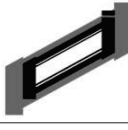

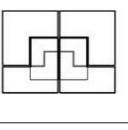

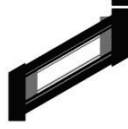
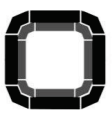
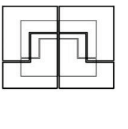



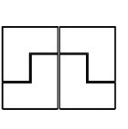

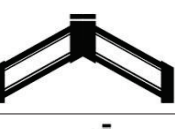

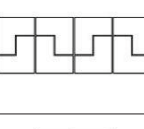



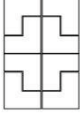
Element rule / Transformation rule	$T_1$	$T_2$	$T_3$	$T_4$
				
$R_1/R_2/R_3$	Unused	Unused	Unused	Unused
$R_4$				
$R_5$				
$R_6$				
$R_7$				
$R_8$				
$R_9$				

Table 2. Continued

Element rule / Transformation rule	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
R <sub>10</sub>				
R <sub>11</sub>				
R <sub>12</sub>				
R <sub>13</sub>				

Source: developed by the authors

According to the formal characteristics of the Ji-anngnan water town bridges, and following the refinement and evolution of the geometric elements, select forms from the base set in Table 2 were used to generate reconfigured designs under defined constraints, as illustrated in Figure 4. Subsequently, the final pattern design was executed, and three sets of pattern results – SG<sub>1</sub>, SG<sub>2</sub>, and SG<sub>3</sub> – were generated, as shown in Table 3.

The refined base elements provided a structured foundation for precise and directionally consistent pattern redesign, inspired by the architectural characteristics of bridges in the Ji-anngnan water town region.

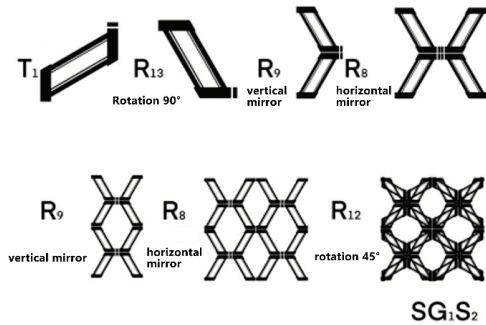


Figure 4. Schematic diagram of element evolution  
Source: developed by the authors

Table 3. Matrix of final cultural and creative pattern designs

Element rule	SG <sub>1</sub> T <sub>1</sub> R <sub>9</sub> R <sub>8</sub> R <sub>13</sub> R <sub>2</sub> R <sub>13</sub> T <sub>2</sub> R <sub>13</sub> R <sub>9</sub> R <sub>8</sub> R <sub>13</sub> T <sub>4</sub> R <sub>9</sub> R <sub>8</sub> R <sub>1</sub>	SG <sub>2</sub> T <sub>1</sub> R <sub>13</sub> R <sub>13</sub> R <sub>8</sub> R <sub>9</sub> T <sub>2</sub> R <sub>7</sub> R <sub>4</sub> R <sub>13</sub> R <sub>4</sub> R <sub>8</sub> R <sub>9</sub> T <sub>3</sub> R <sub>13</sub> R <sub>5</sub> R <sub>6</sub> R <sub>6</sub>	SG <sub>3</sub> T <sub>1</sub> R <sub>9</sub> R <sub>8</sub> R <sub>4</sub> T <sub>1</sub> R <sub>9</sub> R <sub>4</sub> T <sub>4</sub> R <sub>9</sub> R <sub>8</sub> R <sub>9</sub> R <sub>10</sub> T <sub>3</sub> R <sub>6</sub> R <sub>10</sub>
S <sub>1</sub>			
S <sub>2</sub>			
S <sub>3</sub>			

Table 3. Continued

Element rule	$  \begin{matrix}  SG_1 \\  T_1 R_9 R_8 R_{13} R_3 R_{13} \\  T_2 R_{13} R_9 R_8 R_6 R_{13} \\  T_4 R_9 R_8 R_9 R_1  \end{matrix}  $	$  \begin{matrix}  SG_2 \\  T_1 R_{13} R_{13} R_8 R_9 \\  T_2 R_7 R_4 R_{13} R_4 R_8 R_9 \\  T_3 R_{13} R_5 R_6 R_6  \end{matrix}  $	$  \begin{matrix}  SG_3 \\  T_1 R_9 R_8 R_4 T_1 R_9 R_4 \\  T_4 R_9 R_8 R_9 R_{10} \\  T_3 R_6 R_{10}  \end{matrix}  $
SG set			
Extraction result	Pattern design - SG <sub>1</sub>	Pattern design - SG <sub>2</sub>	Pattern design - SG <sub>3</sub>

Source: developed by the authors

**Colour extraction, pattern evaluation and screening**

The predominant colour palette of Zhujiatao Ancient Town comprises neutral tones such as green, white, and grey, with a balanced contrast between warm and cool hues. The buildings display a marked contrast in brightness, with harmonised transitions between walls and roofs, creating an overall natural and refined visual impression. The low-saturation colour system defines the core chromatic perception of the town. Representative buildings emblematic of Jiangnan culture were selected for their significant architectural and cultural value. The primary colours include black, white, grey, ochre, lake blue, indigo, universal blue, dark grey, and deep red, complemented by secondary tones such as light green, vermilion, emerald green, dark green, light yellow, and gold. Two sets of colour schemes - C<sub>1</sub> and C<sub>2</sub> - were designed by extracting hues from photographs using Adobe Photoshop, and these colour groupings were applied in the subsequent redesign process. The schemes are illustrated in Figure 5. To effectively evaluate and optimise the visual characteristics of the redesigned patterns and to preserve their cultural associations with bridge architecture, this study employed a fuzzy comprehensive evaluation method. This addressed the limitations of shape grammar-based evolution, pattern redesign, and colour matching. Three pattern sets and

two-colour schemes were assessed using this method. Evaluation criteria and weighted indicators were established to quantify the performance of each design scheme. These indicators enabled a preference-based synthesis of design attributes under environmental constraints, laying a strong foundation for the application and innovation of the design elements, as presented in Table 4.

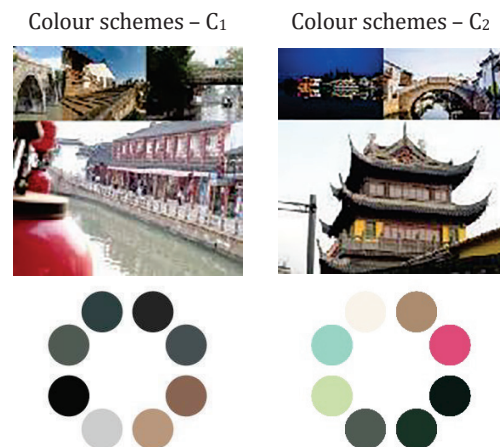


Figure 5. Colour scheme collection table  
Source: developed by the authors

Table 4. SG<sub>1</sub> advantage indicator table

K <sub>A</sub>	Description of indicators	Weighting/%
K <sub>1</sub> - utilisation capability	Excellent formal sensibility and broad applicability in creative contexts	0.51
K <sub>2</sub> - design features	Clear representation of Jiangnan water town architectural elements	0.36
K <sub>3</sub> - pattern advantage	High continuity, replicability, and strong potential for reinterpretation	0.13

Source: compiled by the authors

After the morphological evolution process, three groups of pattern collections were generated, producing a wide range of pattern elements suitable for design combinations. Based on the aforementioned deductions, three pattern collections - SG<sub>1</sub>, SG<sub>2</sub>, and SG<sub>3</sub> - were established. In order to identify the optimal combination of pattern and colour scheme, the fuzzy evaluation method was employed to determine the

preferred evaluation outcomes for the pattern and colour schemes used in this design. The dominant indices were defined as follows: K<sub>A</sub>, the pattern ensemble index, and K<sub>B</sub>, the colour scheme index, as illustrated in Figure 6. In conjunction with the reference to corridor bridge structures and their historical origins, the five sets of dominant indices for the design - K<sub>A</sub> and K<sub>B</sub> - are presented in Tables 4 and 5.

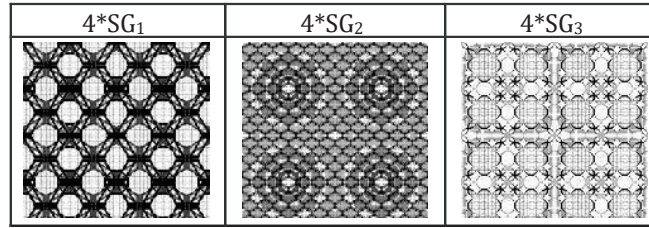


Figure 6. Example of  $K_3$  pattern advantages

Source: developed by the authors

Table 5. $C_1$ advantage indicator table		
$K_B$	Description of indicators	Weighting/%
$K_1$ – utilisation capability	Design value after integrating pattern elements	0.64
$K_2$ – colour attributes	Reflects the Jiangnan water town cultural style	0.36

Source: compiled by the authors

To enhance clarity in both demonstration and evaluation, a schematic table illustrating the advantages of the  $K_A K_3$  pattern was produced (Fig. 6), along with a schematic table demonstrating the  $K_B K_1$  utilisation capability, as shown in Figure 7.

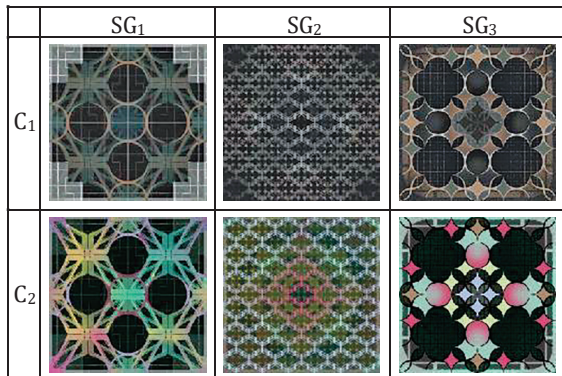


Figure 7. Example of  $K_B K_1$  pattern advantages

Source: developed by the authors

Ten lecturers and 35 visual communication design students from the teaching and research department participated in evaluating the dominant indices of the pattern and colour collections. They contributed to determining the weighting percentages of each dominant index in the bridge design, thereby constructing a comprehensive weighting system for pattern design evaluation.

**Evaluation and optimisation of culturally-inspired design solutions**

Taking into account the requirements of both pattern design and colour schemes, a five-point rating scale was used: very good, excellent, fair, not very suitable, and unsuitable. The scoring vector was assigned as  $\alpha = (90 \ 80 \ 70 \ 60 \ 50) \times$ . The 45 aforementioned participants evaluated each aspect of the styling and decorative design independently. This is summarised in Table 4. A fuzzy comprehensive evaluation matrix was then constructed, and the calculation method along with the results are presented in Tables 6 and 7, using pattern  $SG_1$  and colour scheme  $C_1$  as examples.

Table 6. $SG_1$ final assessment score calculator													
Evaluation matrix						Weighting			Scores				
$P_{SG1}$	0.56	0.24	0.13	0.07	0.00	$K_A$	0.51	$P^*k$	0.286	0.122	0.066	0.036	0
	0.32	0.27	0.37	0.04	0.00		0.36		0.115	0.097	0.133	0.014	0
	0.24	0.37	0.23	0.16	0.00		0.13		0.031	0.048	0.023	0.021	0
/								Total	0.432	0.220	0.222	0.071	0
								$\alpha$	90	80	70	60	50
								Total* $\alpha$	38.88	17.57	15.57	4.25	0
								Score	76.27				

Source: compiled by the authors

Table 7. $C_1$ final rating score calculator													
Evaluation matrix						Weighting			Scores				
$P_{C1}$	0.37	0.39	0.13	0.04	0.00	$K_B$	0.64	$P^*k$	0.237	0.250	0.083	0.026	0
	0.40	0.13	0.28	0.19	0.00		0.36		0.144	0.047	0.1008	0.068	0

Table 7. Continued

Evaluation matrix	Weighting	Scores					
		Total	0.381	0.296	0.184	0.094	0
/		α	90	80	70	60	50
		Total*α	34.27	23.71	12.88	5.64	0
		Score	76.50				

Source: compiled by the authors

From the above, the evaluation weight vectors  $H_{SG1} = P_{SG1} * K_A$ ,  $H_{C1} = P_{C1} * K_B$  for pattern  $SG_1$  and Colour  $C_1$ , together  $H_{SG1} = (0.4320, 0.2169, 0.2224, 0.0709, 0)$ ,  $H_{C1} = (0.3808, 0.2964, 0.1840, 0.094, 0)$ . Finally, multiplying by the scoring vector  $\alpha = (90 \ 80 \ 70 \ 60 \ 50)X$ , the final scores for pattern  $H_{SG1}$  and colour  $H_{C1}$  were 76.27 and 76.50, respectively. The evaluation also produced the following scores for pattern  $SG_2 - 74.33$ , pattern  $SG_3 - 76.27$ , and colour  $C_2 - 79.34$ . As pattern  $SG_1$  and  $SG_3$  achieved equal scores, and colour scheme  $C_2$  outperformed  $C_1$ , the final design presentation incorporates pattern  $SG_1$ , pattern  $SG_3$ , and colour scheme  $C_2$ .

In order to more effectively present the redesigned bridge culture concept, design software was employed to refine and optimise the output. Building upon patterns  $SG_1$  and  $SG_2$ , mask transparency adjustments in Procreate 5.3.4, along with the stacking and interweaving of pattern layers and alpha-locked overlays, were utilised to enhance the texture of the colour scheme without altering the original patterns or palette. This process helped to ensure that the pattern design, based on the architectural features of bridges in the Jiangnan water town, appeared more cohesive and harmonious. Additionally, modifications and enhancements were made to the design according to the characteristics of the patterns, integrating elements consistent with Jiangnan bridge culture. These refinements were intended to align with the aesthetic preferences of tourists, thereby facilitating the seamless integration of the designs into both footwear and broader cultural and creative applications.

**Innovative design of Zhujiajiao bridge pattern casual shoes**

Following the redesign of the bridge patterns, a cross-disciplinary approach combining product design principles was applied to create pattern motifs that convey both a strong design language and the unique character of water towns. This initiative not only presents a novel pathway for the preservation and innovation of Zhujiajiao’s bridge culture but also provides inspiration for the development of cultural and creative products – particularly the design of Zhujiajiao-themed casual footwear, as illustrated in Figure 8.

Using graphic design software, these culturally rich motifs were skilfully embedded into casual shoe designs, creating a bridge between tradition and modernity, and between cultural heritage and contemporary fashion (Fig. 9).



Figure 8. Casual shoe pattern – design presentation 1  
Source: authors’ material



Figure 9. Casual shoe pattern – design presentation 2  
Source: authors’ material

Locally representative casual footwear products were selected and combined with refined pattern designs. A minimalist approach was adopted, with the patterns arranged in a continuous and layered composition. Design elements primarily included patterns  $SG_3$  and  $SG_1$ , while the colour palette was dominated by the cool tones of scheme  $C_2$ . The final visual outcomes are shown in Figures 8, 9, and 10.



Figure 10. Casual shoe pattern – design presentation 3  
Source: authors’ material

The impact of technology on modern society is both profound and multifaceted, influencing nearly every aspect of daily life. This transformation is especially visible in the field of design. Through parametric modelling, generative techniques, and algorithm-driven design, researchers have advanced the automation and optimisation of design processes, enhancing both efficiency and creative capability. In the area of ethnic pattern design, for instance, shape grammar enables the creation of intricate, culturally significant motifs with a level of precision and repeatability that is challenging to achieve manually. Similarly, in architecture, computational design tools have enabled the exploration of complex geometries and structures, pushing the boundaries of design and construction possibilities. Furniture design has also benefited greatly from these advancements, enabling designers to create bespoke pieces that fit seamlessly within a given space and meet specific functional requirements. Three-dimensional shape generation, cultural heritage conservation, and textile and fashion design are further fields in which shape grammar and computational design have made notable contributions. In each of these disciplines, the ability to define and manipulate forms using algorithmic rules has led to more efficient and innovative design processes.

C. Cui & N. Shaari (2023) enhanced shape grammar to enable the efficient reuse and innovative development of national patterns, offering a new approach to intelligent and automated pattern design. A. Chantamool *et al.* (2024) improved shape grammar by incorporating a national narrative research method, focusing on a hand-woven silk group selected through purposeful sampling. Data were gathered via in-depth, face-to-face interviews, and analysed using interpretive thematic analysis. F. Zhang *et al.* (2023) applied shape grammar to interpret the characteristics of box-type furniture in detail, highlighting its importance within Korean traditional furniture. The study proposed ideas for the organic integration of traditional and contemporary Korean furniture design. Y. Li *et al.* (2024) used innovative derivative patterns in the design of modern leather goods, ensuring that the products aligned with contemporary aesthetic sensibilities while retaining national characteristics and cultural depth. Y.L. Wang *et al.* (2024) combined grounded theory principles, shape grammar, and sustainable design methodologies to reinterpret and innovate the aesthetic design of Ming-style furniture. A. Wutte & J.P. Duarte (2021) proposed a parametric shape grammar for ancient Egyptian funerary monuments, which could be used to reconstruct incomplete tombs, extend existing ones, or generate new designs. Y.G. Ying & F.T. Jin (2024) inferred that shape grammar facilitates the effective transformation of designers' knowledge, providing technical support for the intelligent application of shape grammar in design and manufacturing processes. Research into the automatic generation of rule-based logo designs

further illustrates the significant potential of shape grammar in automated design systems. This line of inquiry not only enhances design efficiency but also establishes a solid foundation for the future of intelligent design development.

B.L. Qi *et al.* (2023) analysed and extracted shape feature lines at various levels of train head forms, creating abstract design elements by applying shape grammar. An interactive genetic algorithm was then used to encode these design features. F. Zhang *et al.* (2024) conducted research on gene extraction and intelligent assisted design in the context of Nanjing Republic architecture, highlighting the characteristics of inheritance, selection, replication, and variation in architectural gene expression. This work achieved a creative transformation and innovative development of architectural heritage, demonstrated the potential for intelligent, assisted cultural and creative design, and enhanced the cultural depth of such products. However, in the field of footwear creative design, there remains a lack of research on the application of shape grammar. Footwear design is a complex discipline that integrates both art and technology. Its cultural and creative aspects require not only aesthetic appeal and uniqueness but also account for comfort and functionality. Shape grammar, with its strong capabilities in shape transformation and rule-based reasoning, offers a distinct opportunity for innovation in footwear design. By defining shape rules and transformation logic, a wide variety of shoe designs can be automatically generated while maintaining coherence and design unity. This approach would not only streamline the design process but also create new possibilities for creativity and innovation. Designers could more easily experiment with diverse shapes, patterns, and materials, thereby expanding their range of design options. In addition, shape grammar can support designers in capturing and transforming traditional footwear elements, enabling the modern expression of cultural heritage and its innovative transmission. This is particularly valuable in the context of cultural heritage conservation, where the preservation of traditional footwear design holds significant importance. P. Gerchanivska (2021) conceptualised cultural identity as a resource for social development, revealing its structural integrity through correlations with cultural codes and transformation models.

This study explores casual shoe pattern design using shape grammar, through the extraction and redesign of elements from the ancient town bridges of Zhujiajiao. Other related studies – such as N. Ding *et al.* (2022), on the reuse and optimisation of patterns in furniture design using shape grammar; Y. Li *et al.* (2024), on the automatic generation of logo designs; and Y. Xu & F. Xia (2024), on the integration of shape grammar and the analytic hierarchy process in redesigning Miao embroidery patterns – all demonstrate the broad applicability of shape grammar across design field. These

studies share a common approach with the present article in their application of shape grammar rules for innovative and optimised design. However, this study differs in its design subject, objectives, and evaluation methodology. Moreover, the fuzzy evaluation method employed here offers a novel perspective on design assessment, which is less frequently seen in related research.

## CONCLUSIONS

This study provides a detailed account of the process of redesigning cultural design elements from bridges in Jiangnan water towns, through the extraction and reinterpretation of features from the Zhujiajiao bridge. The coherence of this redesign is closely aligned with the conceptual framework of footwear design. In the final design outcome, a colour scheme was applied that not only integrated the distinctive colours of the water town but also effectively combined regional hues with modern commercial appeal. At the same time, the authors curated a series of patterns that reflect the elements of the Zhujiajiao bridge, which not only enrich the visual layering of the design but also express the harmonious integration of tradition and modernity. The design outcomes not only demonstrate the unique charm of Shanghai Zhujiajiao's traditional culture but

also thoroughly explore its generative logic and visual expression in a modern design context. Using the fuzzy evaluation method, the combination of SG<sub>1</sub> and SG<sub>3</sub> patterns, along with the C<sub>2</sub> colour scheme, was identified as the most popular.

Through this practical exploration, methodological guidance has been provided for the modern reinterpretation and innovative design of traditional Chinese culture. It is also hoped that this design practice will inspire greater interest in, and respect for, traditional culture among designers, thereby supporting the ongoing inheritance and creative evolution of Chinese cultural heritage. It is anticipated that the application of this design concept will continue to broaden, with more elements of traditional Chinese culture being successfully integrated into modern design.

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## CONFLICT OF INTEREST

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## Дослідження проектування моделей повсякденного взуття на основі граматики форми

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**Анотація.** Дослідження було спрямоване на інтеграцію культурних елементів мостів Чжуцзяцзяо в Шанхаї у дизайн моделей повсякденного взуття з використанням граматики форми та методу нечіткого оцінювання. Дослідження було зосереджено на чотирьох знакових мостах – Release, Huimin, Chenghuangmiao та Yong'an – з яких було виокремлено та перероблено характерні візерунки для створення колекції декоративних елементів. Ці візерунки були доповнені кольоровою гамою, натхненною ландшафтом водного міста Цзяньнань. Процес дослідження складався з трьох етапів: вилучення елементів мостів за допомогою дизайнерського програмного забезпечення, редизайн цих елементів на основі правил граматики форми для створення колекції візерунків, а також оцінка візерунків і кольорів за допомогою методу нечіткого оцінювання із залученням викладачів і студентів. Граматика форми, визначена як  $SG = (S, L, R, I)$ , була використана для еволюції початкових елементів мостів за різними правилами, в результаті чого було створено три набори візерунків ( $SG_1, SG_2$  і  $SG_3$ ). Кольорова гама, що характеризувалася нейтральними тонами та контрастними відтінками, була розроблена шляхом вилучення кольорів з визначених будівель у Чжуцзяцзяо. Було створено дві колірні схеми ( $C_1$  і  $C_2$ ), які були зіставлені з наборами зразків. За допомогою методу нечіткого оцінювання ці комбінації було оцінено за такими критеріями, як зручність використання, дизайнерські характеристики та привабливість патернів. Результати показали, що комбінація візерунків  $SG_1$  і  $SG_3$  з колірною гамою  $C_2$  була найкращою. Ці оновлені візерунки та кольори були успішно застосовані в дизайні повсякденного взуття, що призвело до створення візуально привабливого та культурно значущого взуття. Дослідження продемонструвало практичність граматики форми в автоматизації процесів проектування культурно-креативних продуктів, збагачуючи дизайн повсякденного взуття традиційними візерунками мостів і водночас сприяючи поціновуванню культурної спадщини в сучасній моді

**Ключові слова:** культурні елементи моста Чжуцзяцзяо; інтеграція традиційних візерунків; культурна спадщина; китайська культура; сучасне взуття; мода; графічний дизайн



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## Design aspects of post-war reconstruction and renovation of public urban spaces

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**Abstract.** This study aimed to systematise existing approaches, principles, and trends related to the restoration and renovation of public spaces, while also identifying the actual needs of residents through surveys. Based on the findings, recommendations are proposed for the post-war development of public urban spaces. The primary methods used for data collection included visual analysis, individual surveys, and interviews with residents to determine their genuine needs. The results were structured using general scientific research methods. The survey revealed that 63% of respondents expressed a willingness to participate in the renovation and revival of damaged public urban spaces. 43% believed the restoration process should retain historical elements that existed prior to destruction, supplemented with new components. Among those surveyed, 31% preferred complete restoration to the pre-war state without alterations, while 36% wished to see elements of military memorial themes incorporated into the renewed public spaces. The study outlined key aspects highlighting the significance of public space in the functioning of a modern city and identifies major challenges associated with their post-war formation. Methodological recommendations have been provided to guide the formation, restoration, and renovation of public spaces, taking into account both residents' interests and current trends. Existing approaches, ideas, and proposals for the renewal and renovation of public urban spaces have been systematised and supplemented with new concepts. Evaluation criteria for public urban spaces have been refined based on indicators such as functional and spatial organisation, principles of public space formation, development prospects, and public participation. Mechanisms for civic engagement in the restoration and renovation of public spaces have been proposed for all stages – discussion, design, planning, and practical implementation. The findings of this study may be applied by designers and architects in developing projects for the reconstruction of war-damaged public spaces, as well as by local authorities during their implementation

**Keywords:** spatial planning; post-war transformation; public participation; residents' needs; architectural environment; urban identity; design solutions

### INTRODUCTION

Russia's full-scale military aggression against Ukraine has resulted in the destruction not only of buildings, structures, and infrastructure but also of public spaces and recreational zones within the urban environment. The most extensive damage occurred in frontline cities, although virtually all cities across Ukraine have been

affected by the war to varying degrees. The scale of destruction clearly indicates that the entire urban infrastructure – including public spaces – requires both restoration and renovation. In the long term, the post-war recovery and renovation of Ukraine's urban public spaces is one of the key factors influencing planning

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processes at various levels: national, sectoral, regional, and local. Moreover, the need to develop a comprehensive national recovery plan, particularly for public spaces and urban recreational areas, remains pressing even before the full onset of the post-conflict period.

The issue of forming and restoring urban public spaces has been examined from various perspectives in numerous studies. In their exploration of urban design as a project-based and artistic activity, I.V. Ladygina & A.O. Rudenko (2024) focused on the functional and spatial organisation of urban environments and their material and spatial components. The authors noted that certain public spaces – such as squares, boulevards, embankments, gardens, and parks – constitute key elements of the structural framework of the urban landscape. In the article by M. Husiev (2024), it is argued that the spatial and planning structure of public urban spaces serves as a key reflection of the history and culture of the residents. Therefore, various aspects of the functioning and transformation of public spaces should align with the lifestyle and traditions of their users. Yu.V. Idak (2020) emphasised that the transformation of public spaces should be based on a combination of traditional and contemporary approaches. Similarly, S.K. Al-Mosawy *et al.* (2021) noted in their study that the restoration and renovation of public spaces in cities affected by armed conflict can draw upon practical experience and real-world examples from other countries. Drawing on the post-World War II experience of restoring public spaces in German cities, S. Neugebauer (2021) focused on the importance of adhering to fundamental criteria for assessing the attractiveness of public spaces – namely, identity and individuality. The author argued that observing the principles of identity and individuality in the renovation of public spaces contributes to a city's uniqueness.

In her research, V. Praslova (2021) stated that the renovation of open public spaces should be grounded in the principles of multifunctionality and inclusivity, which are key directions in the development of contemporary public environments. Inclusivity is an essential component of modern public spaces and must be integrated into any project focused on the restoration and renovation of a damaged urban environment. According to A. Alkazei & K. Matsubara (2021), incorporating innovative architectural and design solutions – based on the experience of countries that have undergone post-war recovery – is a vital tool in creating inclusive, multifunctional, and future-oriented public spaces in post-war settings.

During the post-war restoration and reconstruction of historical urban areas, the principles of accessibility and social inclusion serve as important benchmarks for renovation, as noted by N.A. Leshchenko (2024). In her article, N. Sosnova (2021) argued that the development of public spaces must take into account collective preferences and the right of all users to contribute to their

formation. This approach increases public engagement and usage of such spaces. Public spaces should be designed to encourage civic activity, providing venues for community gatherings, cultural events, and leisure, as highlighted by researchers V.V. Vorobyov & O.S. Shylo (2022). They also emphasised that the stylistic integration of old and new architecture is a crucial aspect in the formation of public spaces during the post-war reconstruction of Ukrainian cities.

A review of academic studies revealed that researchers have primarily focused on the challenges of organising public spaces, the principles of their development, and the criteria for assessing their quality. Scholars have noted that within Ukraine, there are currently very few examples of restored public spaces damaged by the war, and there is a lack of clear guidance regarding their functional and spatial renovation structure. This highlighted the need for further research on the topic, taking into account regulatory requirements, cultural and traditional specificities of the residents, and current trends in public space design. Therefore, this study aimed to summarise approaches and trends in the renovation of public spaces and to provide recommendations for their post-war development, based on a conducted survey.

## **MATERIALS AND METHODS**

The research employed general scientific methods, including analysis, synthesis, generalisation, systematisation, and surveying. A review of academic literature helped to identify existing approaches to the reconstruction and renovation of public urban spaces. The method of synthesis allowed for the integration of different ideas, concepts, and proposals to form a comprehensive understanding of the issues surrounding public space restoration. Generalisation enabled the identification of key trends and existing solutions that may be applied to post-war recovery and renovation efforts. The systematisation of fragmented data provided a structured scientific framework within the context of design-related aspects. The survey method offered deeper insight into user preferences and gathered suggestions for the restoration and improvement of public spaces.

The survey was conducted by the authors together with students of Cherkasy State Technological University, who volunteered to assist throughout 2024 under the slogan “Civic Engagement in the Renovation and Development of a Comfortable Urban Environment”. The aim was to assess the condition of existing public spaces in cities across Ukraine. In addition to observing the state of public areas, a survey was carried out among residents and visitors in the cities of Cherkasy and Kyiv (Ukraine).

The survey involved 597 respondents, divided into two categories: city residents (377) and visitors (220). The participants included 79 educators, 194 students,

69 civil servants, 137 business employees, and 118 individuals from other professions (Table 1). Respondents were both men and women aged between 16 and 75, who voluntarily disclosed their age and occupation. The geographical background of respondents covered Cherkasy, Kyiv, Kharkiv, and Donetsk regions (Ukraine),

as the survey included students, internally displaced persons, and visitors to Cherkasy from those areas. Most participants were students from Cherkasy State Technological University. The survey was conducted both among working individuals within organisations and on the streets of the city.

**Table 1.** Distribution of respondents by profession

Respondents	Educators	Students	Civil servants	Business employees	Others	Total
Residents	62	115	51	88	61	377
City visitors	17	79	18	49	57	220
<b>Total</b>	79	194	69	137	118	<b>597</b>

**Source:** compiled by the authors based on original survey data

In line with the research objectives, respondents were invited to answer seven open-ended questions with suggested response options, along with one free-form question allowing them to share their personal opinions (Table 2). Respondents were informed about the aims of

the survey and the research in general. Ethical aspects of the study were aligned with the principles of the Declaration of Helsinki (2013). Following the initial analysis of the survey results, statistical processing and synthesis of the collected data were carried out by the author.

**Table 2.** List of survey questions

No.	Question	Response options
1	How often do you visit public spaces?	a) Every day b) Several times a week c) Several times a month d) Several times a year e) I do not visit them
2	How would you rate the quality of public spaces before the war?	a) Excellent b) Good c) Satisfactory d) Poor
3	How has the war affected the condition of public spaces?	a) It has worsened b) No change c) Difficult to answer
4	Are you willing to participate in discussions on the reconstruction and renovation of public spaces?	a) Yes b) No c) It is the responsibility of the authorities d) Difficult to answer
5	How do you view the extent of renovation of public spaces?	a) Complete preservation of all original elements b) Preservation of historical elements with the addition of new features c) Full transformation with the introduction of modern urban design elements d) Difficult to answer
6	Which elements would you recommend including in the design of public spaces?	a) Historical and cultural themes b) Military and memorial themes c) Creative small architectural forms d) Elements showcasing scientific achievements
7	In your opinion, are city residents sufficiently involved in decision-making related to the development of public spaces in the urban environment?	a) Yes b) No c) Difficult to answer
8	What would you suggest to improve the overall quality of public spaces?	Please provide your own suggestions

**Source:** compiled by the authors

The research methodology was designed to ensure a comprehensive and multidisciplinary approach to the study of public space transformation. By combining theoretical insights with empirical observations, the study aimed to capture both structural patterns and human-centred dimensions of urban renewal. This approach allowed for the integration of diverse perspectives relevant to the socio-cultural, spatial, and participatory aspects of post-war reconstruction.

## RESULTS AND DISCUSSION

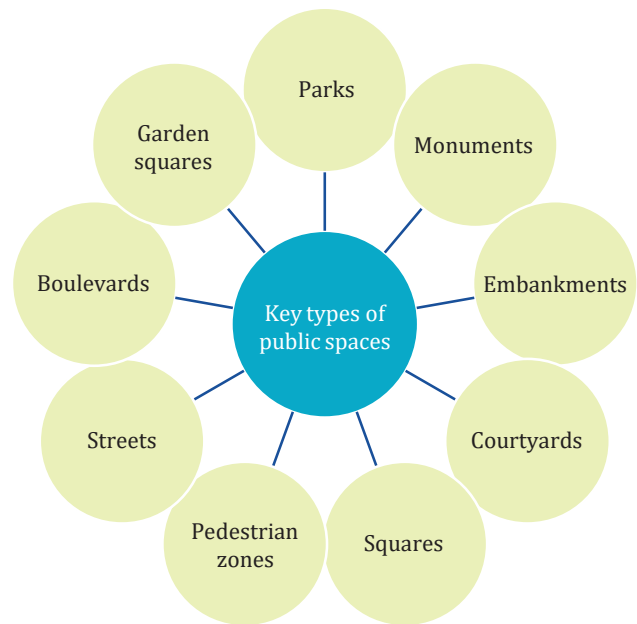
Renovation and revitalisation of public spaces and recreational areas in urban environments destroyed as a result of military aggression represent one of the primary objectives of Ukraine's post-war recovery. The renovation and revitalisation process must follow a multi-step approach, incorporating plans for the short-, medium-, and long-term future. This process requires not only technical and engineering solutions but also the integration of current trends in urban planning.

The definition and components of public space vary among researchers. For instance, according to I.I. Ustinova & A.S. Matsokha (2024), a public urban space is described as municipal property open for unrestricted public access, facilitating communication and social interaction. However, in modern cities, municipal and private open spaces are often closely interwoven. C. Nelischer & A. Loukaitou-Sideris (2023) define public space as part of the urban territory accessible to everyone and designed for non-commercial use, reflecting the city's social and cultural character. It is also considered a place for communication, leisure, recreation, public events, and social interaction. This interpretation fully aligns with the present study. Although researchers differ in their definitions of public space and its elements, all approaches converge on a shared understanding: public space is an open, universally accessible urban area that fosters social interaction, recreation, and communication while reflecting the city's socio-cultural context.

Public space should be regarded as a multifunctional platform for social interaction, economic exchange, and cultural expression among a wide range of social groups. It should be designed to promote human development, foster peaceful and democratic societies, and encourage cultural diversity. To ensure multifunctionality, the Declaration of UN HABITAT III Issue Papers (2015) proposed allocating 45% of urban land to streets and public space. Specifically, it is recommended that 30% of the urban area be designated for streets and pavements, and 15% for open public spaces and green zones.

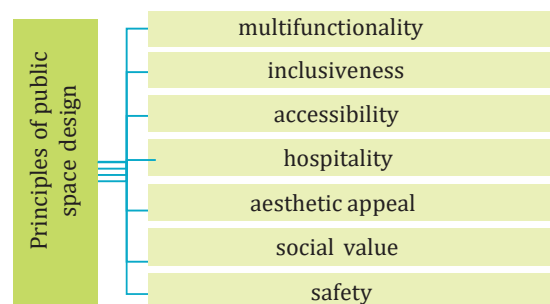
Types of public spaces in the urban planning context include pedestrian streets, squares, boulevards, embankments, parks, garden squares, and residential courtyards, all shaped by historical, cultural, social, and economic factors (Kudumovic, 2020). In a social dimension, such spaces are public domains that respond to

socio-economic changes and serve as hubs of civic life. A sufficient quantity of high-quality, inclusive public space that reflects the cultural and social needs of the population is essential for increasing social activity and visitor engagement. Modern public spaces have become an important element of the urban environment, integrated into residential developments and commercial complexes. They function not only as practical areas but also as spaces that enhance comfort, support social activity, and improve the overall quality of life. Based on their spatial structure, the main types of publicly accessible spaces can be identified (Fig. 1).



**Figure 1.** Key types of public spaces  
**Source:** systematised by the authors

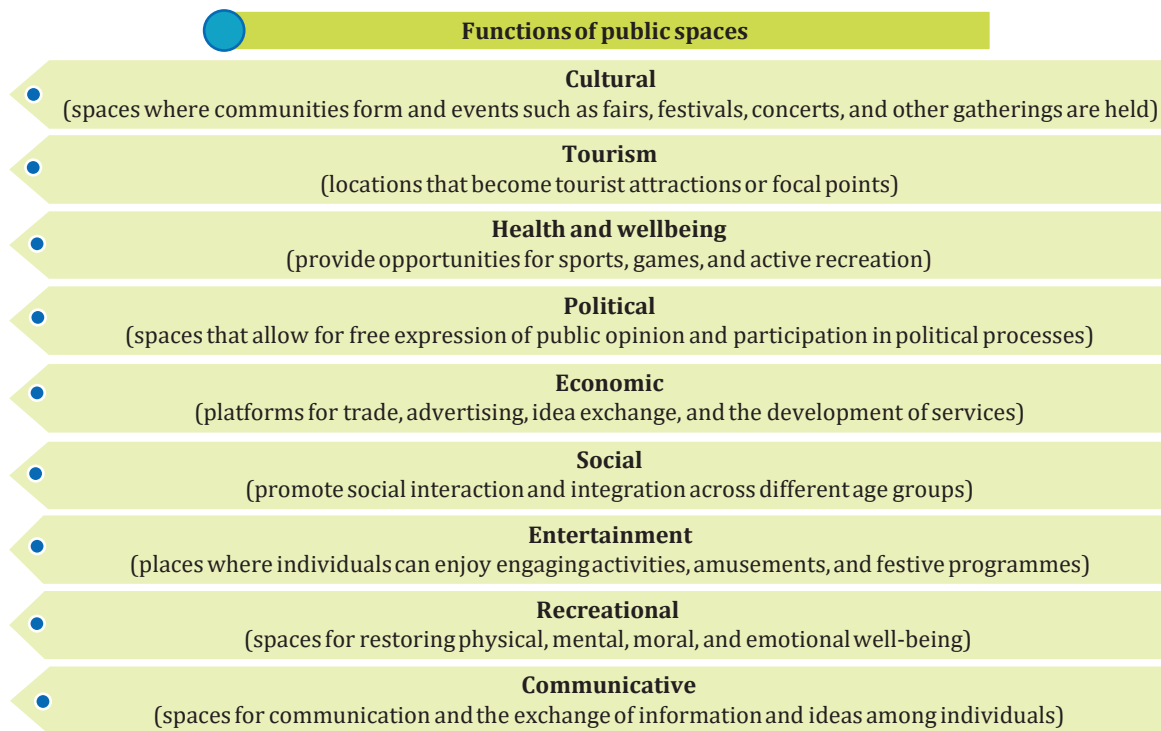
In the restoration and renovation of all types of public spaces, an effective approach involves implementing the core principles of inclusive environment design and enhancing quality in line with contemporary trends, as emphasised by H. Kamalipour (2023). The authors of this study have systematised and expanded the principles of public space design, building upon and enriching the researcher's ideas (Fig. 2).



**Figure 2.** Core principles of public space design  
**Source:** systematised by the authors

Public spaces in modern cities serve multiple important functions, acting as centres of social activity (Fig. 3). The creation of clearly defined and purpose-driven spaces often becomes a key factor in the

development of the urban environment. Once a public space is established, it is essential to ensure the fulfilment of its functions as an integral component of a comfortable and effective urban setting.



**Figure 3.** Key functions of public spaces

**Source:** systematised by the authors

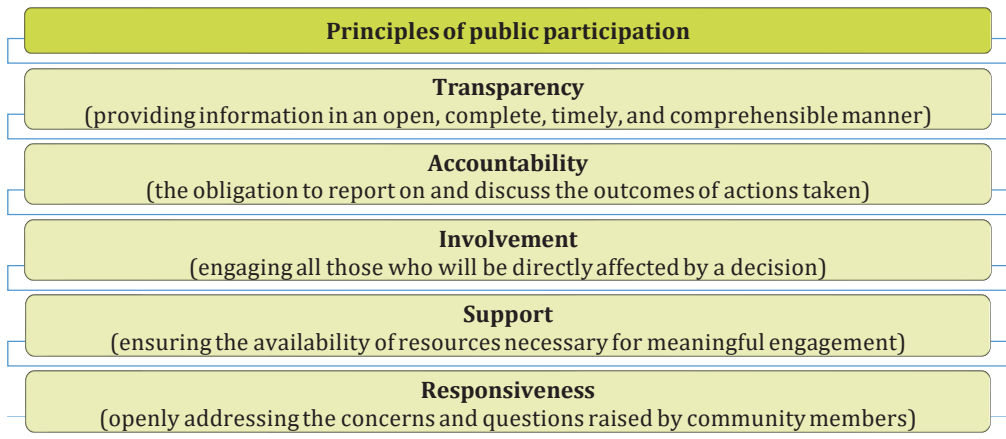
A. Uhl *et al.* (2021) noted that, under contemporary conditions, public spaces must fulfil essential functions and respond to the social, environmental, and cultural needs of the population. When these requirements are met, public spaces become more attractive and frequented by residents. This necessitates the development of new concepts in which comfort is combined with innovative approaches and modern trends. In the process of designing urban renovation projects, it is essential to incorporate current trends that serve as tools for shaping high-quality public spaces. Among the leading trends in the development of contemporary public spaces, several key characteristics can be distinguished, reflecting the evolution of approaches to their design and function. Multifunctionality refers to the ability of a space to serve multiple purposes simultaneously, addressing the needs of various user groups. Transformability involves the flexibility of spatial elements to adapt to dynamic environmental changes or evolving social demands. Interactivity is evident in the implementation of interactive features such as touch panels and the use of smart technologies that enhance the functionality and user experience of the space. Cultural and historical thematisation is achieved through the integration of artefacts that represent the cultural, artistic, and

historical identity of a city or community. Greening, as a key environmental component, involves the inclusion of vegetation and compositions of herbaceous and flowering plants, contributing to the creation of a comfortable and aesthetically appealing environment. Spatial identity is established by creating a unique image, character, and atmosphere that distinguishes one urban space from another. Lastly, inclusivity refers to the level of accessibility and usability of public space for all segments of the population, including people with disabilities, the elderly, and children – an essential factor in ensuring social equity and justice. In this context, the findings of S. Bollano (2024), which examined the planning of “Cities of the Future” in Albania, are particularly relevant. The study confirmed the importance of a balanced integration of innovative technologies, energy efficiency, cultural heritage preservation, and economic resilience as key factors in the successful development of urban environments. The approaches identified in Albanian cities – such as the creation of eco-parks, restoration of historical sites, and digital integration – may be adapted to local contexts in the development of public spaces in various countries.

The success of renovation and reconstruction depends on the application of progressive, innovative

solutions – not only during the planning and restoration of damaged public spaces but also in the ongoing development of the urban environment as a whole. This requires the formulation of a comprehensive approach, beginning with a project design that incorporates modern technologies and extending to the active

involvement of residents in decision-making processes. Public participation in discussions and decisions concerning socially significant issues plays a crucial role in improving the quality and attractiveness of public spaces. The engagement of citizens should be based on the following socially innovative principles (Fig. 4).



**Figure 4.** Key principles of public participation

**Source:** systematised by the authors

Public participation in the discussion of social projects can play a significant role in strengthening the relationship between society and municipal authorities, while also increasing public trust in decision-making. In the context of public space regeneration, citizen engagement becomes especially relevant, as it enables effective consideration of the real needs, preferences, and interests of residents. Involving the community ensures that the use of public spaces aligns with specific local demands. Therefore, the foundation for creating a comfortable and functional public space lies in engaging all stakeholders from the early stages of design through to implementation. This inclusive approach helps to develop shared solutions that meet the needs of a broad cross-section of the population.

There are numerous tools and mechanisms available for gathering public opinion. However, the typical sequence of interaction with the public during the planning of public spaces may follow these steps:

1. General information dissemination.
2. Gathering data on population needs, analysing existing issues, and collecting suggestions from residents.
3. Development of a general project concept.
4. Public discussion of the project sketch.
5. Publication and coordination of the project with residents.
6. Implementation of the proposed design.

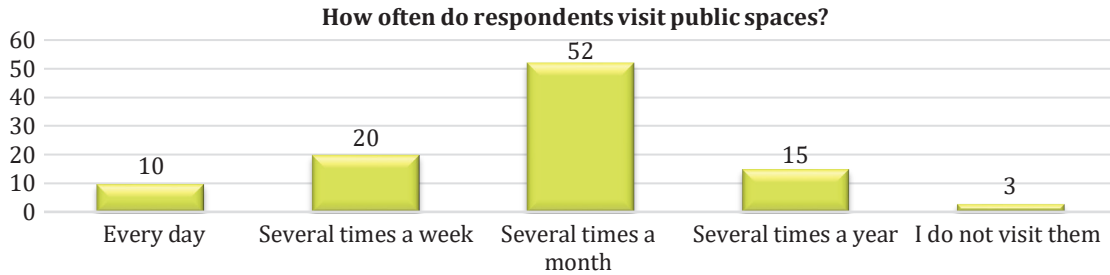
O. Zavalnyi *et al.* (2023) emphasised that conducting a preliminary study and comprehensive analysis of the damaged area of a region is advisable before proposing a project concept. The authors stressed that the creation of a high-quality urban environment is

impossible without addressing existing problems. In their research, I. Dreval & A. Zhabina (2021) noted that the quality of the urban environment is assessed based on its capacity to meet users' needs. This aligns with the core principle of user-oriented design. For a space to function effectively and remain popular among residents, it must respond to their needs and interests, which should be identified through communication and active participation in the renovation and regeneration of public spaces. Considering public opinion is a key driver of successful implementation and the creation of a comfortable public environment. Communities can express their vision, articulate their needs, draw attention to existing issues related to the functioning of public spaces – such as parks, squares and courtyards – and propose potential solutions and ideas. Based on this, and in line with the theme and aim of the present study, the authors carried out an assessment of public opinion on the subject.

Researchers X. Zhang & Y. He (2020) identified one of the most important concepts in the development of public spaces as their ability to foster social cohesion through communication and the exchange of information among people. This concept is supported by the results of the survey presented in this article, which show that the population regards public spaces as key places for meeting and social interaction. Survey results revealed that the majority of urban residents (52%) visit public spaces several times a month. Overall, 97% of respondents frequent urban public spaces to varying degrees, indicating a strong interest in improving their quality (Fig. 5). Thus, public space serves not only

as a physical environment but also as a social institution that facilitates communication, the generation of ideas, and the formation of collective actions. The high rate of attendance underscores the role of such spaces

as meeting points, platforms for social interaction, and arenas for the exchange of ideas. Public spaces may therefore be considered key communicative locations for a broad spectrum of the population.

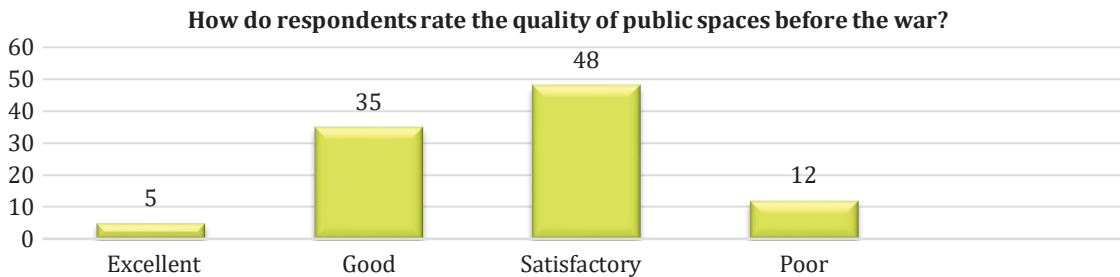


**Figure 5.** Frequency of visits to public spaces

**Source:** compiled by the authors based on original survey data

Researchers H.M. Azhar *et al.* (2021) argued that the quality of public spaces has a direct impact on individuals' psychological and physical well-being. Based on the authors' own research, it can be further asserted that high-quality and universally accessible public spaces are capable of meeting residents' needs and improving urban quality of life. The quality of public spaces is one of the key factors in shaping an attractive, comfortable,

and inclusive urban environment. Well-designed public spaces should meet the criteria of safety, convenience, and accessibility for people of different social and age groups. According to the survey, prior to the outbreak of full-scale war in 2022, the general quality of public spaces in most settlements was assessed as relatively satisfactory: 35% were reported to be in good condition, and 48% were in satisfactory condition (Fig. 6).

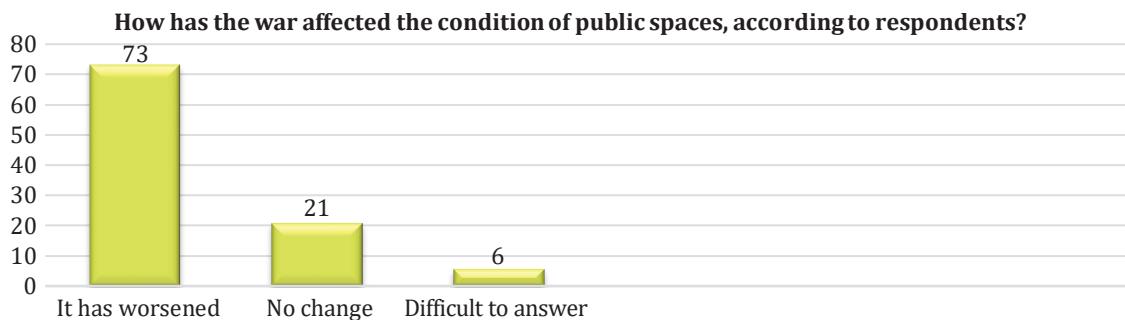


**Figure 6.** Assessment of public space quality before the war

**Source:** compiled by the authors based on original survey data

The conducted study showed that, as a result of military actions, the quality of public spaces has significantly deteriorated. In some locations, public spaces were completely destroyed or rendered unfit for use. More than 70% of respondents confirmed

damage to public spaces alongside residential and infrastructure facilities (Fig. 7). This highlighted the need to assess the extent of destruction and begin drafting recovery and renovation plans for urban spaces even before the war ends.

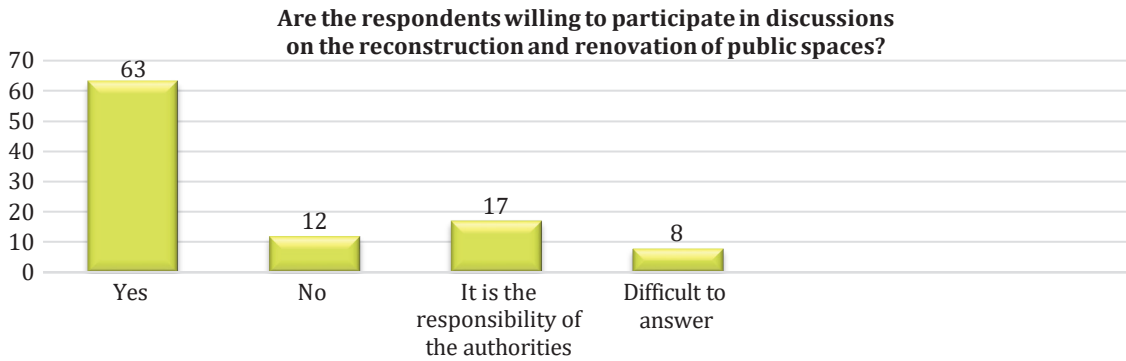


**Figure 7.** Impact of war on the condition of public spaces

**Source:** compiled by the authors based on original survey data

The analysis of the survey results revealed that city residents expressed openness and willingness to participate in the renovation and revitalisation of a comfortable urban environment – from the discussion stage through to the implementation of improvement projects. Sixty-three per cent of respondents indicated readiness to engage in various forms and at all stages of

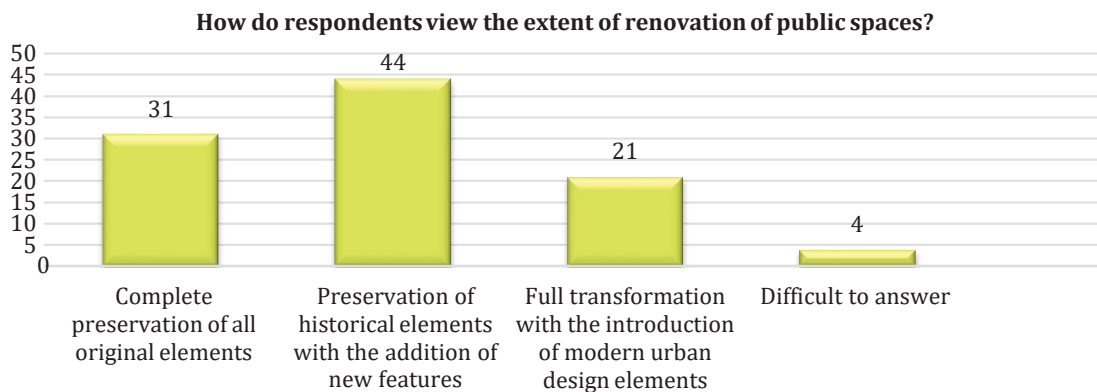
the project life cycle, and many proposed specific mechanisms for shaping public space (Fig. 8). This reflects the population’s active civic stance and patriotism, which positively influences the development of public spaces. Harnessing this potential through active involvement in the design and restoration of public spaces will accelerate progress and increase the popularity of urban sites.



**Figure 8.** Citizens’ willingness to engage in discussions on the restoration and renovation of public spaces  
**Source:** compiled by the authors based on original survey data

According to the survey, 44% of respondents believed that public space restoration should combine historical elements with new components, while 31% favoured a full reconstruction of the pre-war appearance (Fig. 9). This indicates a strong desire among residents to preserve local identity and traditions while remaining open to renewal and modernisation. The study by N.Y. Merzhiievska & V.H. Sukhanov (2023), using the example of Odesa, examined public spaces within historic urban developments as active

elements of city infrastructure. These spaces can be transformed into modern facilities (such as heritage hotels), due to their high architectural and aesthetic value, which contributes to the cultural and economic development of the city. Therefore, an optimal restoration strategy should be based on a dialogue between the past and the present, allowing both the preservation of the urban environment’s identity and the fulfilment of current residents’ needs for functional, safe and inclusive spaces.



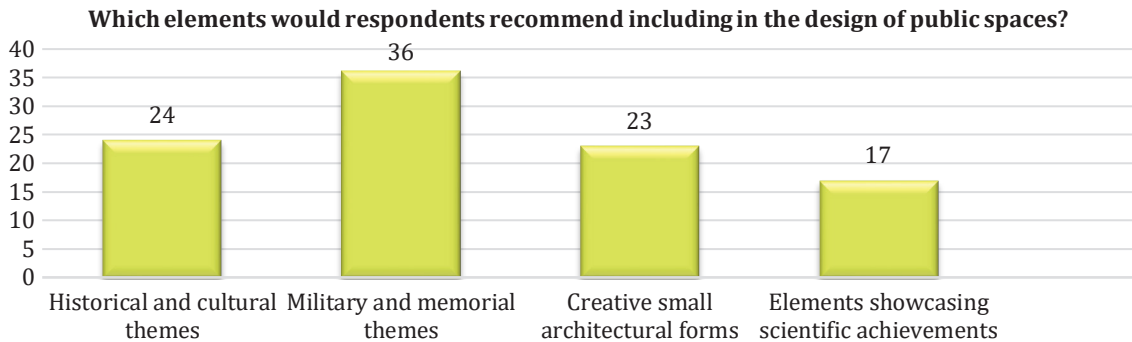
**Figure 9.** Degree of public space renovation  
**Source:** compiled by the authors based on original survey data

The challenges of preserving and revitalising national identity amid rapid globalisation are addressed in the study by T. Kashchenko *et al.* (2021). The authors provided classical examples of the harmonious integration of architecture and landscape design in urban spaces that reflect national identity – specifically through public spaces in China and Japan, where

certain traditions and cultural values were incorporated into the creation of modern parks. Respect for the national characteristics of the population is one of the key principles in the restoration and development of public spaces. The importance of considering the national identity of city residents – alongside other factors – is supported by the results of this study, which

were obtained through a public survey. Over a quarter of respondents emphasised the necessity of incorporating historical and cultural themes into the design of public space restoration projects. When asked which components they would like to see in renewed public

spaces, 36% of city residents identified commemorative elements with a military/memorial theme (Fig. 10). This indicates a desire among citizens to honour the memory of national heroes and preserve history for future generations.



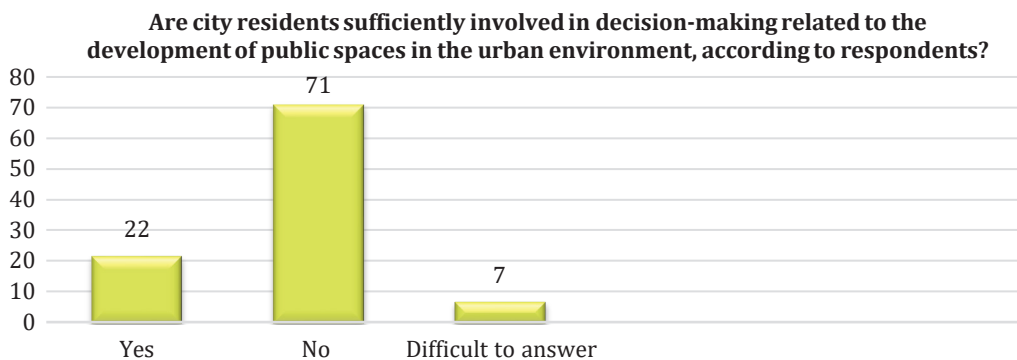
**Figure 10.** Recommended components for public spaces

**Source:** compiled by the authors based on original survey data

The study’s findings reveal a positive attitude among residents towards including military/memorial elements in the composition of public spaces. This emphasis reflects the relevance and significance of integrating military themes into urban recovery projects. Considering the role of public spaces in people’s lives and leisure, W. Holy-Hasted & B. Burchell (2022) highlighted the importance of involving the public in shaping the urban environment to create spaces that residents enjoy and identify with. However, the findings of this study indicate that local authorities often disregard public participation when discussing urban development concepts for public spaces. By involving residents in discussions about the future of public spaces, city authorities can reach decisions that better reflect the needs and interests of the wider community.

& A. Lane (2021), in which the authors emphasised that engaging in dialogue with residents encourages their active involvement in addressing various social issues. Based on the findings of the present research, it was confirmed that such dialogue fosters tolerance and mutual understanding promotes discussion of real challenges related to post-crisis recovery, and helps to accommodate diverse perspectives. In response to the question, “In your opinion, are city residents sufficiently involved in decision-making related to the development of public spaces in the urban environment?”, the majority of respondents (71%) stated that local authorities do not put such projects up for public debate, and therefore they had not taken part in discussions on any particular initiative (Fig. 11). This indicates that public participation in shaping the urban environment is often viewed by city officials as unimportant.

The creation of a platform for communication with the population was examined in the study by M.L. Kent



**Figure 11.** Level of public involvement in decision-making on the development of public spaces within the urban environment

**Source:** compiled by the authors based on original survey data

City residents, as direct users of public spaces, play a crucial role in their restoration and improvement.

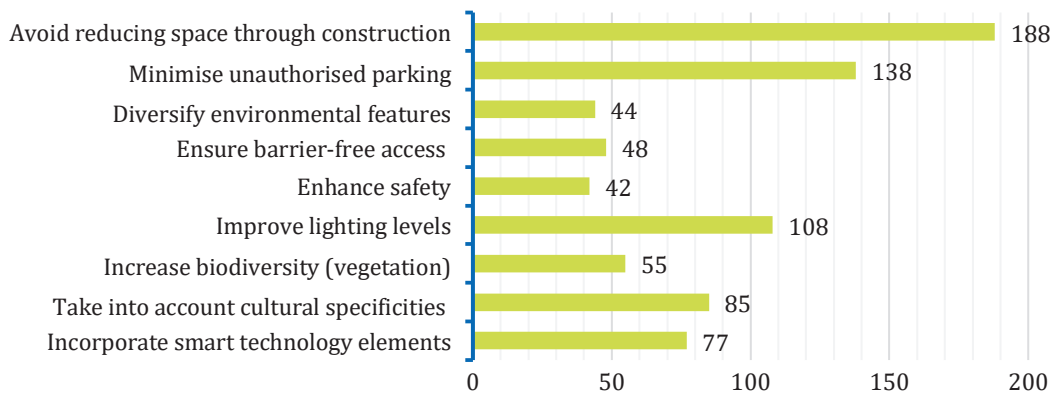
Harnessing the creative potential of the community can serve as a foundation for shaping a high-quality,

modern, and functional urban environment. Collaboration between local authorities and the public enables the development of shared solutions that take into account the interests of all parties, reducing the risk of social tensions and urban disputes. Active public participation in the planning and implementation of spatial development projects contributes not only to the effective transformation of urban space but also to increasing trust in municipal initiatives. In this context, it is essential that city authorities take the lead in initiating and supporting citizen involvement at every stage of urban renewal processes.

G. Valatkaityte & B. Svagzdiene (2024) emphasised that the effective organisation of leisure in public spaces requires an integrated approach that considers the needs of diverse user groups, the characteristics of the

surrounding area, and the collective goals of local communities. This study addressed the importance of such a comprehensive approach in restoring damaged public spaces. Among the elements of this approach is the inclusion of the population in resolving urban issues. The significance of public involvement in both the restoration of damaged and the creation of new public spaces is also confirmed by the findings of this research.

Public participation in discussions on urban environment planning at the local level is one of the most important factors in improving the quality of recreational areas. In this context, the survey also aimed to identify the main issues residents face when visiting public spaces. To this end, an open-ended question was included, allowing respondents to list their suggestions for enhancing the quality of public spaces (Fig. 12).



**Figure 12.** Residents' suggestions for improving the quality of public spaces

**Source:** compiled by the authors based on original survey data

An analysis of the survey results revealed that the main concerns expressed by residents regarding the development of public spaces include: the reduction of public-use areas in favour of residential or commercial construction, the presence of unauthorised parking, and insufficient lighting. Respondents also emphasised the importance of reflecting the cultural specificity of the area when designing such spaces, alongside the integration of modern technological solutions (such as smart devices) and other innovative elements (Fig. 12). Residents' subjective perceptions often correlate with the actual condition of the environment and can serve as a valuable source of information for local authorities in spatial planning processes.

Based on interviews with community activists and field observations, several key barriers to effective interaction between local authorities and the public were identified:

- a low level of public awareness regarding urban development plans;
- a lack of transparency in decision-making processes for project implementation;
- the absence of mechanisms for public oversight during the execution of initiatives;

- a lack of effective feedback channels, public hearings, and opportunities for resident involvement;
- an unclear distribution of responsibilities among the institutions accountable for the urban environment.

The survey also showed that over half of the respondents expressed interest in actively participating in urban planning and the reconstruction of damaged facilities. Establishing meaningful dialogue between communities and governing bodies is essential for identifying current challenges, developing relevant solutions, and enhancing the effectiveness of public space transformations. Therefore, the successful transformation of public spaces requires transparent communication between authorities and residents.

## CONCLUSIONS

The study found that the effective resolution of issues related to the functioning of public spaces lies in the creation of a multifunctional, inclusive urban environment that addresses the needs of all social groups and takes into account the historical and cultural characteristics of the area. The importance of public engagement in the planning, implementation, and monitoring of urban recovery and renovation projects has been demonstrated,

as it enhances both the effectiveness and social legitimacy of these initiatives. A comprehensive approach to public space renewal has been proposed, aimed at creating comfortable living conditions, fostering a favourable sociocultural environment, supporting civic interaction, and enabling the realisation of collective initiatives.

The survey results confirmed the relevance of the issue: 188 respondents noted a trend towards the reduction of public space due to new construction, particularly in central urban areas. At the same time, 63% of respondents expressed a willingness to take part in initiatives aimed at restoring such spaces, indicating the presence of considerable civic potential that should be taken into account in administrative decision-making. Approximately 70% of respondents also confirmed that public spaces had been damaged as a result of armed aggression, particularly in the south-eastern region of Ukraine. This highlights the urgent need for

damage assessment and the development of appropriate renovation projects. Future research should focus on an in-depth analysis of the extent of destruction across specific public spaces and the development of tailored recommendations for their restoration, with due regard to the specific characteristics of the local environment and community needs.

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#### CONFLICT OF INTEREST

None.

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## Аспекти дизайну повоєнної відбудови і реновації публічних просторів міського середовища

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**Анотація.** Метою роботи була систематизація існуючих підходів, принципів та тенденцій щодо відновлення та реновації публічних просторів, а також виявлення реальних потреб мешканців шляхом проведення опитувань, та пропонування рекомендації щодо повоєнного формування публічних просторів міського середовища. Під час дослідження основними методами отримання первинної інформації були візуальний аналіз, індивідуальні опитування і бесіди з мешканцями для виявлення їх реальних потреб, результати яких було систематизовано загальнонауковими дослідницькими методами. Опитування показало, що 63 % респондентів демонстрували готовність брати участь у реновації та відродженні руйнованих публічних просторів міського середовища, 43 % вважали, що процес відновлення має містити ті історичні елементи, які були до руйнування з додаванням нових компонентів. Серед опитованих 31 % хотіли б побачити повне відновлення без змін, як було до війни, а 36 % – бачити в оновлених публічних просторах елементи військово-меморіальної тематики. Сформульовано аспекти, які характеризують важливість публічного простору у функціонуванні сучасного міста та подано проблемні питання при їх формуванні. Надано методичні рекомендації необхідні для формування, відновлення та реновації публічних просторів з урахуванням інтересів мешканців та сучасних тенденцій. Систематизовано та викладено існуючі підходи, ідеї та пропозиції щодо відновлення та реновації публічних просторів міського середовища та доповнено новими концепціями. Вдосконалено критерії оцінки публічних просторів міського середовища за показниками функціонально-просторової організації, принципу формування громадських просторів, перспективи розвитку і принципу громадської участі. Запропоновано механізми громадської участі у відновленні і реновації публічних просторів на етапах обговорювання, проектування, планування та у практичній реалізації проєктів. Результати даного дослідження можуть бути використані дизайнерами і архітекторами при розробці проєктів відбудови зруйнованих публічних просторів внаслідок війни, а також органами місцевого самоврядування під час їх реалізації

**Ключові слова:** просторове планування; післявоєнна трансформація; громадська участь; потреби мешканців; архітектурне середовище; міська ідентичність; дизайн-рішення



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## Problems of restoration of easel graphics of the late 18<sup>th</sup> to early 20<sup>th</sup> centuries depicting castles of Galicia

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**Abstract.** The blossoming of typography in Galicia during the late 18<sup>th</sup> and early 20<sup>th</sup> centuries helped popularise engravings depicting castle architecture. A significant portion of these structures are now either lost or ruined, highlighting the urgent need for their professional restoration as a vital component of preserving Ukraine's cultural heritage. The aim of this article was to investigate the challenges and specific characteristics of restoring and conserving late 18<sup>th</sup> to early 20<sup>th</sup>-century engravings featuring Galician castles, as well as to analyse methods for reconstructing lost parts of these architectural objects. The methodology included analysing historical engravings of Galician castles, researching the techniques and materials used in their creation, and reviewing modern restoration and conservation methods. The article provided an in-depth analysis of the engraving restoration process, particularly the reconstruction of lost sections of architectural images. It identified the primary issues restorers face, such as paper degradation, ink fading, and mechanical damage. Considering the article's objective – focusing on the peculiarities of restoring castle engravings from the late 18<sup>th</sup> to early 20<sup>th</sup> century – the conducted research revealed the main problems in preserving and restoring these artworks. The article explored approaches to reconstructing lost fragments of images, with a particular emphasis on working with the architectural details of castles. Special attention was paid to the specific nature of restoring and conserving engravings from the period under investigation, taking into account their creation techniques and the materials used. The importance of this research lies in its ability to offer practical recommendations for restorers, art historians, and historians working with similar graphic materials. The findings will contribute to the development of scientifically sound methodologies for preserving valuable historical images of Galician castle architecture for future generations. Furthermore, the article's content will be beneficial in museum work, archival practice, and in preparing scholarly publications on art and architectural history

**Keywords:** engravings; architectural objects; conservation; cultural heritage; reconstruction; historical significance

### INTRODUCTION

Despite the significant contributions of academics to the study of Galician fortification architecture, paper and engraving restoration, and methods for reconstructing lost image sections, the comprehensive topic of restoring easel graphics depicting 18<sup>th</sup>-19<sup>th</sup> century castles has not yet received adequate attention. This necessitates a deep analysis of the peculiarities of preserving this specific art form, considering its historical, artistic, and architectural value, as well as the considerable number of Galician castle structures, many of

which are in ruins or a state of disrepair. The relevance of this research is defined by several key aspects that underscore its scientific and practical significance in the context of preserving Ukraine's cultural heritage. Primarily, the substantial number of surviving late 18<sup>th</sup> to early 20<sup>th</sup>-century engravings documenting Galician castle architecture serve as invaluable primary sources for historical, architectural, and art-historical research. These graphic works not only capture the aesthetic characteristics of the structures but also reflect their

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condition during a specific historical period, which is especially crucial given the numerous destructions and reconstructions these objects have undergone over time.

In this regard, engravings act as a unique visual record of the evolution of architectural forms and urban planning trends in the region. Therefore, as M. Bevz & T. Pinyazhko (2022) highlighted, studying the peculiarities of their restoration and conservation has become particularly relevant, as it ensures the preservation of information about objects that have undergone irreversible changes. Furthermore, the growing interest of the academic community and the public in local history and cultural heritage necessitates in-depth research and popularisation of visual sources, which include engravings. Their proper preservation and restoration will not only enrich academic knowledge but also raise the level of cultural awareness in society, and can also positively influence the development of cultural tourism in the region, as confirmed by studies in the field of historical and cultural heritage preservation. A comprehensive study of the problems of restoring and conserving engravings depicting Galician castles is a timely and necessary step to preserve an important part of Ukraine's cultural heritage.

The challenges of preserving graphic works and architectural heritage in general have attracted the attention of many researchers. Specific aspects of restoration, such as the peculiarities of working with tracing paper, which can be applied during the preparatory stages of engraving restoration, and the problems of acidity in the process of preventive conservation of architectural graphics, were explored by M.O. Borysenko (2021a; 2021b). The work of Galician engravers, although without a direct focus on restoration, was analysed by L. Kupchynska (2022) and M. Bihun *et al.* (2018), which is important for understanding the artistic context of the investigated engravings. The architectural heritage of Galicia, particularly 19<sup>th</sup>-century fortification architecture, in a pan-European context and from the perspective of preservation, was researched by M. Bevz & T. Pinyazhko (2022) and K.-T. Havryliv (2021). Engravings, as visual records of the past, are undoubtedly valuable iconographic sources that can significantly aid in the process of restoring castles and other defensive structures. This is especially relevant in cases where original buildings have suffered significant destruction or have not survived to the present day. In turn, J. Tai (2021) explored the possibility of creating 3D objects based on historical engravings, which opens up new perspectives for virtual reconstructions and provides restorers with a clear understanding of the original appearance of structures, thus serving as an invaluable source for future restoration work. The article by V. Karpov (2023) analysed the formation of the Ukrainian school of monumental painting restoration in the 1950s-1960s, outlining the main approaches,

achievements, and problems of restoring wall paintings, which became defining for the development of national restoration.

These studies, although not always directly dedicated to the restoration of engravings depicting Galician castles, shed light on important aspects related to the preservation of graphics, the study of the region's artistic heritage, and the research of architectural images, which provides important context for investigation. However, as the review of scientific literature indicates, a comprehensive work focusing specifically on the peculiarities of restoring engravings depicting Galician castles from the period under study (late 18<sup>th</sup> – early 20<sup>th</sup> century) is absent. Individual aspects of this topic have been touched upon in research. For example, M.O. Borysenko (2021a) examined the specifics of restoring graphic works based on tracing paper. In turn, L. Kupchynska (2022) analysed the work of Galician engravers, but the issues of restoring their works were not the central aspect of her scientific interest.

A comprehensive study of the problems, challenges, and specific peculiarities arising in the process of restoring and conserving late 18<sup>th</sup> to early 20<sup>th</sup>-century engravings depicting Galician castles includes not only the identification of typical damage caused by time, materials, and storage conditions, but also a deep analysis of the physico-chemical properties of the paper and dyes used during this period, as well as the study of engraving techniques characteristic of the time frame and their influence on modern restoration approaches. Thus, the aim of the study was to form a holistic understanding of the problems of restoring and conserving the investigated engravings, and a comprehensive analysis of existing theoretical and practical methods for restoring graphic works, with the subsequent development of practical recommendations for their effective preservation.

## ■ MATERIALS AND METHODS

The subject of this research is the complex set of problems and specific characteristics associated with the restoration and conservation of late 18<sup>th</sup> to early 20<sup>th</sup>-century engravings depicting Galician castles. The chronological scope of the study is defined by the historical period when this region was part of the Habsburg Monarchy, the Austrian Empire, and Austria-Hungary. This era was characterised by the active development of printing and the creation of a significant number of graphic images that now require preservation.

To achieve the stated goal, a range of scientific research methods were applied. The historical method allowed for an analysis of the historical context in which the engravings were created, and an investigation into the development of printing techniques and materials used in Galicia during the specified period. This helped in understanding potential preservation issues stemming from the specific manufacturing

processes of engravings from that time. The analytical method was used to study existing academic literature, methodological guidelines, and practical experience in the field of graphic art restoration, particularly engravings. It also involved an analysis of the causes of various types of damage typical for paper documents of the period under study. The comparative method was employed to contrast different approaches and methodologies for engraving restoration, assessing their effectiveness and applicability to the specifics of engravings depicting Galician castles, as well as to compare preservation challenges for engravings from this region with similar problems in other European countries. The systemic method enabled the restoration process to be viewed as a holistic system, encompassing the study of the material base, the image, the historical context, and the ethical aspects of cultural heritage preservation. Based on the analysis of literary sources and existing practices, information regarding typical damage to engravings, their conservation and restoration methods, and problems specific to the investigated material was generalised and systematised. During the research, reliance on information websites was limited and primarily used for a general overview of the region's history, the development of printing, and specific aspects of restoration work. Priority was given to the analysis of academic literature, professional publications, materials from scientific conferences, and methodological guides on graphic restoration.

The research was conducted in the following stages: firstly, defining and outlining the scope of problems based on literature analysis and general knowledge of graphic preservation to identify the main challenges in restoring 18<sup>th</sup> to early 20<sup>th</sup>-century engravings. The next step involved analysing the influencing factors that lead to engraving damage (physical, chemical, biological, climatic), with particular attention to the specific materials and engraving techniques of the period under study. Subsequently, an overview of existing restoration methods was carried out, including contemporary and historical approaches to the conservation and restoration of graphic works, assessing their feasibility and potential risks when applied to engravings depicting Galician castles. Special attention was paid to identifying specific problems by analysing the characteristics of engravings depicting Galician castles (execution techniques, materials, historical value) to pinpoint unique issues requiring individual consideration during restoration. The final stage was generalisation and formulation of conclusions, which included systematising the identified problems and peculiarities of restoring the investigated type of engravings, as well as formulating conclusions regarding optimal approaches and the need to adapt existing methodologies.

The analysis was conducted according to the criteria set by L.S. Dziedzeliuk & L. Loda (2010): identifying

typical damage characteristic of engravings from the period under study (mechanical, chemical, biological, etc.); considering the specifics of materials and engraving techniques of the 18<sup>th</sup> to early 20<sup>th</sup> century when assessing preservation problems and selecting restoration methods; evaluating the effectiveness of existing methods and the potential consequences of applying traditional and modern restoration techniques to the material under study; considering ethical aspects, particularly the principles of non-intervention, reversibility, and respect for authenticity when addressing the restoration of lost fragments of castle images; and accounting for the specifics of the depicted objects, i.e., the architectural and historical value of the depicted castles when developing approaches to loss reconstruction. The described methodology ensured the possibility of conducting a comprehensive study of the problems of restoring engravings depicting Galician castles based on the analysis of available sources and practical experience in this field.

## RESULTS AND DISCUSSION

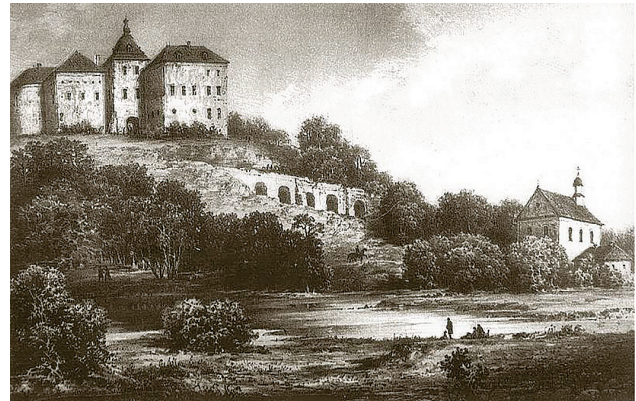
In Lviv, several printing houses operated during this period, including the Lviv Dormition Brotherhood Printing House, the Polish-Latin printing house of the Holy Trinity Brotherhood, and private presses such as those of Jozef Halczewski (1735-1751), Ivan Filipovych (1753-1767, the most influential), and Jan Schlichtyk (1755-1787). Many other printing houses were also established across the region in towns like Rohatyn, Krylos, Uhniv, Uhornyky, and Przemysl. One of the most influential typographies of the time was the Piller family's typography, founded in 1772. The establishment of this typography in Lviv coincided with the emergence of the Viennese School of Graphics, whose representatives often depicted the architectural landscapes of the city and its surroundings (Korol, 2007; Kupchynska, 2022). This growth in printing significantly boosted the creation of easel graphics. Common subjects included architectural landscapes, nature, palaces, and castles. A large number of engravings depicting Galician castles are held in Ukraine's national collections (primarily within Galicia), and they are in need of restoration and proper storage conditions. These works are unique repositories of information, as many of them show lost architectural elements of castles and changes in the surrounding landscape. The research conducted into the problems and specific characteristics of restoring and conserving late 18<sup>th</sup> to early 20<sup>th</sup>-century engravings featuring Galician castles has revealed key aspects that define the strategies for preserving this valuable historical and cultural material. An analysis of academic literature confirms the existence of various methods for restoring graphic works on paper, each with its own specific applications.

Among the main methods for restoring the paper substrate, relevant to the engravings studied, are

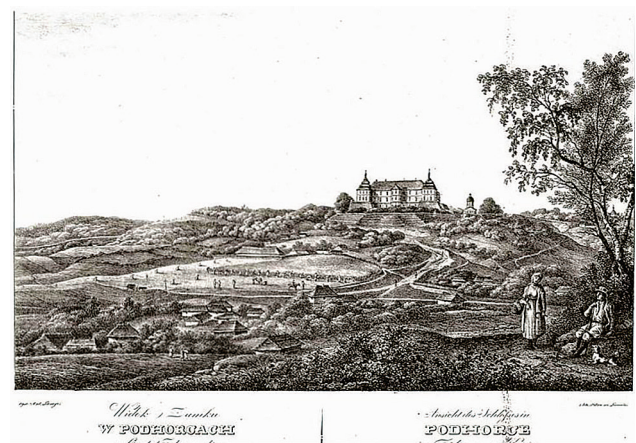
mechanical and wet cleaning, deacidification, paper strengthening, and loss compensation. The preservation of graphic works on paper is a constant focus for academics and practitioners. M.O. Borysenko (2021b) made a significant contribution to understanding the degradation processes of cellulosic materials, with research focusing on the impact of paper's chemical composition on its durability, and the effect of acidity on the image. The conservation and restoration of graphics, including practical aspects of restoration and the development of methodological guidelines, are covered in works by L.S. Dziedzeliuk & L. Loda (2010) and A. Lipińska (2011). The documentation and reconstruction of lost fragments of cultural heritage objects, including graphic works, were studied by M. Stadnik (2019). In the context of paper restoration methods, the work of M.O. Borysenko (2021b) was particularly interesting. The authors provided an overview of key paper conservation and restoration methods, including cleaning, strengthening, and filling losses, with practical recommendations for their application. An important source for understanding pre-restoration research is the methodological advice from L.S. Dziedzeliuk & L. Loda (2010). This authors thoroughly examined the stages and methods of preliminary research, which are critically important for developing an effective strategy for restoring graphic works. They emphasised the need for comprehensive study of the object's physical and chemical condition, identification of materials and execution techniques, and analysis of the causes and nature of damage before any restoration interventions begin. Their methodological advice is directly applicable to the study of engravings depicting Galician castles, helping to determine the optimal approaches to their preservation. The article by P. Matosek & M. Ciechańska (2011) highlighted the restoration process of a unique 18<sup>th</sup>-century fan, focusing on preserving its artistic value and physical integrity. The authors demonstrated how a combination of traditional and modern methods allowed the object to regain its original form and functionality.

The iconography and principles of using Ukraine's architectural heritage in the works of Napoleon Orda were studied by I. Berezina (2007). The work of engravers who depicted Lviv and Galicia, specifically Karl Auer, was analysed by O. Vvedenskyi (2012). P. Sachek & Y. Kravchenko (2014) also studied the work of Napoleon Orda (Fig. 1). The development of printing in Galicia was studied by S. Korol (2007) and N. Ivanyshyn (2011). Certain aspects of the work of artists such as Anthony Lange, who depicted the landscapes of Galicia, were considered by H. Derhachova (1994) (Fig. 2). The catalogue of engravings of the 17<sup>th</sup> to 20<sup>th</sup> centuries from the collections of the Stefanyk Lviv Scientific Library, including the architecture of Lviv, was compiled by S.P. Kostyuk (1989), which is an important source for the identification and study of such graphic works.

The study by K.-T. Havryliv (2021) has demonstrated the importance of historical context and iconographic accuracy in the study of the architectural heritage of Galicia. His approach to analysing visual sources can be useful in assessing the authenticity of castle depictions in engravings and making decisions about the possible restoration of lost details. For example, the engravings of Olesko Castle (Fig. 1) and Pidhirtsi Castle (Fig. 2) depict the landscape and architectural features, and this data can serve as iconographic sources for future restoration work.



**Figure 1.** Olesko at the headwaters of the Styr River, 1870s. Lithograph by Napoleon Orda  
**Source:** Sobieski Castle in Olesko (n.d.)



**Figure 2.** The castle in Pidhirtsi, 1823.  
 Lithograph by Anthony Lange  
**Source:** Castle in Pidhirtsi (n.d.)

Thus, an analysis of the works of leading researchers in the field of restoration and art history has confirmed the complexity and multifaceted nature of the problems of preserving graphic works. Applying the general principles of paper conservation to the specifics of engravings depicting Galician castles requires a deep understanding of their historical, artistic, and material context. The study of the problems of restoration of engravings depicting castles of from the late 18<sup>th</sup> to

early 20<sup>th</sup> centuries revealed that the process of restoring such objects is complex and multi-stage, covering both the restoration of the paper base and the restoration of the image itself. The success of restoration measures directly depends on a preliminary detailed diagnosis of paper damage, since it is the condition of the paper that determines the durability of the image.

According to the methodological recommendations of L.S. Dziedzeliuk & L. Loda (2010), paper damage characteristic of the studied prints is divided into several main types. Mechanical damage, which includes clear lines of breaks, tears, and breakthroughs without blurred boundaries. These damages usually do not change the chemical composition of the paper and can be repaired by restoring the material base. Chemical damage caused by acids, alkalis and salts, which leads to the degradation of pulp and other paper components. Biological damage, including damage by insects and rodents, which is also referred to as mechanical damage, and damage by moulds, which manifests itself in the form of stains, paper loss, general structural destruction, brittleness and fragility of the sheet. Water damage, which can be easily identified by halos, wetting marks, ink smudging and deformation of the paper, and can also cause 'cementing' and sticking of sheets. Fire damage, which has typical signs such as brittleness, paper loss, charring, warping, sooty stains and image damage. General contamination of paper sheets with dust, dirt and fingerprints. Degradation caused by environmental factors, such as extreme temperature fluctuations and light exposure, which can lead to warping, yellowing, loss of paper strength, and damage and fading of the ink layer. Damage caused by polluted air, in particular acid gases (sulphur, nitrogen and carbon oxides), which cause increased brittleness and yellowing of sheet edges, discolouration of paper, reduced mechanical strength, pH changes and ink discolouration.

These destructive factors lead to changes in the paper structure, the destruction of organic matter and the formation of decay products, which often requires urgent restoration measures. In addition to the condition of the paper, an important aspect of print restoration is the preservation of the printing or watercolour ink. Before starting work, it is necessary to carefully examine the strength and moisture resistance of the ink layer. The strength of the ink's bond to the substrate is checked organoleptically and by mechanical impact under a magnifying glass to assess its integrity. The presence of craquelures may indicate a loss of paint elasticity and the risk of shedding, which requires preliminary strengthening of the paint layer or the creation of a protective barrier. In case of loss of brightness and clarity of the image, methods of strengthening and preserving the existing paint layer, as well as tinting lines and parts of the image that have partially or completely lost their colour saturation, are used. Toning with special water-based inks helps to restore the clarity of the image

and make the work look more presentable, and is also reversible if necessary.

Watercolour underpainting of 18<sup>th</sup>-19<sup>th</sup> century engravings (Fig. 3) constitutes a special category of objects of research and preservation due to the specific properties of the materials used. Characteristic of the works of such authors as Anthony Lange, Karl Auer, Napoleon Orda, Vogel, and Josef Swoboda, it is distinguished by a combination of graphic basis and pictorial elements, which expands the information value of the visual source. However, the water-solubility of watercolour pigments makes it necessary to avoid any direct contact with water or a humid environment, which can lead to blurring of colours, loss of contour clarity and colour intensity. It is unacceptable to apply wet cleaning methods or use chemical solvents that can irreversibly damage both the watercolour layer and the paper base. Mechanical impact on the underpainted areas, including friction, is also unacceptable due to the risk of physical loss of pigment. Given the potential sensitivity of watercolours to light radiation, it is necessary to ensure that prints are stored under controlled lighting conditions to prevent fading. The study of such objects should be limited to non-invasive methods of visual analysis and documentation, and conservation measures should mainly concern the stabilisation of the paper base without direct intervention in the watercolour layer.



**Figure 3.** Watercolour underpainting of engravings  
**Note:** a – Ostroh Castle, 1796. Lithography, watercolour by Sigmund Vogel; b – Pidhirtsi Castle, first half of the 19<sup>th</sup> century. Lithograph and watercolour by Karl Auer  
**Source:** Ostroh castle (n.d.), Pidhirtsi Castle (n.d.)

Once the restoration processes for the paper and image of the engravings are complete, they can be conserved for future preservation. If necessary, the image itself undergoes reconstruction, particularly for

easel graphics depicting castle architecture. This type of work is well-suited for restoration due to several factors: the ability to analyse the architecture of surviving structures and compare them with the engraving; the availability of drawings, plans, and works by other regional artists, which allows for inferences about lost image parts; the possibility of analysing the author's style based on their other works; and the capacity to restore some lost elements by directly analysing the image itself, especially in cases of minor damage (such as folds or tears). The reconstruction of lost sections of Galician castle images is unique because of the abundance of iconographic sources and the preservation of a significant portion of the architectural heritage itself. Surviving graphic works, as well as photographic and archival materials, provide a valuable foundation for recreating lost details. Furthermore, castle architecture often features recurring elements (window openings, arches, decorative details), which increases the likelihood of their reconstruction based on preserved image fragments or analogous elements on other parts of the structure.

Among the methods for restoring lost parts of an image, digital reconstruction holds a special place, as explored in the works of M. Stadnik (2023). However, it's worth noting that these studies on digital restoration mainly pertain to illustrative materials and codices, as presented in the aforementioned work. The application of digital technologies to restore lost elements specifically in architectural engravings is a less explored area. M.O. Borysenko's (2021a) research focused on the peculiarities of restoring architectural images executed on tracing paper. In this work, the author meticulously describes the process of analysing the state of preservation and methods for restoring lost fragments on this specific material. Nevertheless, it's important to mention that tracing paper was not a typical base for engravings during the period under study (17<sup>th</sup>-18<sup>th</sup> centuries), when engravings were primarily done on paper. Despite this, the principles of loss analysis and approaches to their restoration described by M.O. Borysenko can be useful in developing restoration strategies for paper-based engravings, especially during the preparation and documentation stages of restoration interventions. In an article, L.P. Zatoka (2009) analysed the main methods for strengthening weakened paper document bases and examined the use of traditional and modern adhesive compositions that meet conservation safety and effectiveness requirements.

Given the absence of established approaches to restoring lost elements specifically on engravings depicting castle architecture, the insights from researchers who studied similar aspects in related fields have become particularly valuable. Thus, the principles of loss analysis and approaches to their reconstruction, described in studies of architectural graphics on tracing paper, can be adapted for application to paper-based engravings. Methods for documenting and

reconstructing lost fragments of objects are also relevant to this research. General principles of digital reconstruction, although primarily researched on illustrative material, can be applied considering the specifics of architectural images. Therefore, integrating existing research in graphic restoration and digital technologies creates a foundation for the effective restoration of lost elements in engravings depicting Galician castles.

Restoring lost parts of architecture in engravings offers distinct advantages compared to reconstructing other types of images. Architectural objects, unlike more dynamic or organic forms, adhere to clear geometric patterns and structural principles. This makes their reconstruction process more controlled and predictable, as existing fragments and knowledge of typical architectural elements allow for a higher probability of reconstructing missing parts. Thus, digital reconstruction opens up significant prospects for recreating lost information in engravings depicting Galician castles, relying on the structural predictability of architectural forms and available iconographic materials, making this process especially valuable for cultural heritage preservation.

It's important to note that the initial stage of work for preserving engravings depicting castles, namely the conservation of the material base (paper) and the stabilisation of the existing image, generally does not differ significantly from the conservation processes for other graphic works. The specific characteristics of restoration manifest precisely at the stage of reconstructing lost parts of the image, where it is essential to consider the architectural features of the object and utilise available iconographic materials for their reconstruction.

## CONCLUSIONS

The research conducted into the problems and specific characteristics of restoring late 18<sup>th</sup> to early 20<sup>th</sup>-century engravings depicting Galician castles has allowed for a systematic understanding of the key aspects in preserving this valuable historical and cultural material. It is established that the restoration process is complex and includes the restoration of both the paper base and the image itself, with the condition of the paper being a determining factor for the further durability of the object. The study describes in detail the classification of paper damage typical of the studied prints, including mechanical, chemical, biological damage, as well as the effects of water, fire, and environmental factors. The importance of preliminary diagnostics to determine effective methods of repairing these damages is emphasised.

The study also revealed the peculiarities of restoring the paint layer of prints, in particular, typographic and often present watercolour inks. The necessity of a thorough determination of the strength and moisture resistance of the paint layer before starting any restoration interventions, especially for water-soluble paint, is emphasised. Methods of strengthening, preservation

and careful tinting of the paint layer to restore image clarity are proposed. Particular attention is paid to the reconstruction of lost parts of the image of castle architecture, which is particularly promising due to the possibility of analysing preserved objects, historical drawings and stylistic features of ancient graphic works. The study describes various reconstruction methods, each of which has its own advantages and limitations. The inclusion of graphic elements in the study made it possible to visualise typical damage, the peculiarities of artistic techniques, including watercolour underpainting, and the potential for reconstructing lost details. The analysis of these images confirmed the significant informative value of engravings as a historical source and demonstrated the specificity of approaches to their restoration, revealing individual features of the

preservation of different samples. Prospects for further research include the development of specialised restoration techniques adapted to the unique features of engravings depicting Galician castles, the study of specific collections, and the introduction of modern technologies for their conservation, restoration, or digital reconstruction.

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## Проблеми реставрації станкової графіки кінця XVIII – початку XX ст. із зображенням замків Галичини

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**Анотація.** Розквіт типографії у Галичині наприкінці XVIII – на початку XX століття сприяв популяризації гравюр із зображенням замкової архітектури, значна частина якої нині втрачена або зруйнована, що актуалізує потребу в її фаховій реставрації як складової збереження культурної спадщини України. Метою статті було дослідження проблем і особливостей реставрації та консервації гравюр кінця XVIII – початку XX століття із зображенням замків Галичини, а також аналіз методів відновлення втрачених частин архітектурних об'єктів. Методологія включала аналіз історичних гравюр із замками Галичини, дослідження технік і матеріалів, використаних при створенні цих гравюр, та огляд сучасних методів реставрації і консервації. У статті проведено глибокий аналіз процесу реставрації гравюр, зокрема відновлення втрачених частин зображень архітектурних об'єктів. Визначено основні проблеми, з якими стикаються реставратори, такі як зношування паперу, вицвітання чорнил та механічні пошкодження. Зважаючи на мету статті, присвяченої особливостям реставрації гравюр із зображеннями замків кінця XVIII – початку XX століття, проведено дослідження дозволило виявити основні проблеми збереження та реставрації цих творів. У статті проаналізовано підходи до відновлення втрачених фрагментів зображень, з акцентом на особливостях роботи з архітектурними деталями замків. Особливу увагу приділено специфіці реставрації та консервації гравюр досліджуваного періоду, враховуючи техніки їх створення та матеріали, що використовувалися. Важливість цього дослідження полягала у його здатності надати практичні рекомендації для реставраторів, мистецтвознавців та істориків, які працюють з подібними графічними матеріалами. Отримані результати сприятимуть розробці науково обґрунтованих методик збереження цінних історичних зображень замкової архітектури Галичини для майбутніх поколінь. Крім того, матеріали статті будуть корисними в музейній справі, архівній роботі та при підготовці наукових публікацій з історії мистецтва та архітектури

**Ключові слова:** гравюри; архітектурні об'єкти; консервація; культурна спадщина; відновлення; історична значимість



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## Design of a Ukrainian patriotic stamp to identify the state in the context of globalisation

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**Abstract.** In the period of search for state identification, the visual culture of postage stamps plays an important social and patriotic component in the representation of the state's features and historical events in the context of global geopolitics. The main goal of the study was to determine the synchronicity of social constructs, views, and collective perceptions of Ukrainians with the design of the Ukrainian patriotic stamp. The study used general scientific historiographical and special methods. The analysis of the social game Postcrossing showed that postage stamps and epistolary style are undergoing a substantial transformation and popularity within society and beyond, which contradicts the interpretation of the "archaic nature of postage stamps". It is established that public demand has had a qualitative impact on the dynamic development of stamp issuance in Ukraine. The announcement of competitions to select the optimal and relevant design of a postmark has confirmed the fairly stable positioning of this segment of graphic products as a tool of state-building visual communication. The dynamics of interest and relevance of the postage stamp design are reflected in the implementation of a number of interesting and highly artistic pieces, including the diploma works of students of the Department of Design and Architecture Fundamentals of Lviv Polytechnic National University. The design projects demonstrated that in this type of visual culture, it is important to consider three main components: function, with its specific standards and requirements, theme, and the search for an appropriate and clearly defined figurative and stylistic language. If these segments are accounted for in the design of postage stamps, they will not only serve as a state mark but also contribute to the formation of a holistic identity of Ukraine adapted to the global space

**Keywords:** postmark; postcrossing; visual culture; global society; design project; identity

### INTRODUCTION

The role of the postage stamp as an element of visual communication reflects the processes of state-building and social transformation, which is relevant given

the need to form a national identity, preserve historical memory, and represent cultural codes in the global information space. A more differentiated study of foreign

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publications has shown that the narrow subject of this study is indirectly present, but not overly emphasised. For the most part, quite interesting publications and editions were found that demonstrate the current development, trends, and stylistic and technical aspects of the ongoing development of the postage stamp as an integral part of fine arts and crafts and an object of contemporary design. In his book, R.L. Scott (2025) explored the evolution of postage stamp design in the 21<sup>st</sup> century, with a focus on innovative approaches and technologies. Stamp magazine reviews (2024) provided the latest news and analysis of stamp issues from around the world, including interviews with designers and reviews of new series. In the book by E. Tran (2025), the materials of the site Australian postal history (n.d.) presented a study on the impact of digital technologies on the design and production of modern postage stamps and their role in the digital society.

H. Nakamura (2025) examined current trends in stamp design, including the use of new materials and interactive elements. The most extensive investigation of the issue of postage stamps as an important identifier of statehood was conducted by H. Hoyo (2010) in a large monographic paper on the philosophical-aesthetic and political-ideological function of postage stamps. In particular, the category of understanding and perception is considered – why and how postage stamps should be viewed. The patriotic content of the Ukrainian postage stamp, with a complex search for the national context, is widely discussed in the collective monograph by O.V. Potylchak *et al.* (2021). The modern challenges of designing patriotic design products during the period of the full-scale war in Ukraine, 2022-2025, are addressed by V. Radomska & S. Ponkalo (2023). M. Makar & V. Savka (2023), using the created social construct, attempted to create a certain social pattern to trace how traditional and modern elements characteristic of pop culture are combined in the graphics and content of a postage stamp.

Several Ukrainian researchers (Bokareva, 2007; Orekhova, 2020; Potylchak, 2021) analysed the visual and content features, utilitarian aspects of postage stamps, and their importance as one of the forms of state identification. Recently, international authors have paid considerable attention to modern postage stamps, especially those that reflect events in Ukraine and support from the international community. In particular, the publication of I. Krupnyk (2022) covered in detail the issues of stamps of 11 countries, which have created at least 44 types of stamps with a total circulation of 4 million copies since the beginning of the full-scale war. These stamps, dedicated to the Ukrainian theme, have become symbols of solidarity and support. In June 2023, the stamp “Russian Warship, Go...”, issued by Ukrposhta (n.d.), was recognised as the best in the world according to the “World Post & Parcel Awards 2023”. This stamp was written about by such international

media as CNN, The Guardian, The Times, The Washington Post, and Bloomberg, it was an exhibit of the Smithsonian Postal Museum in Washington (Gordychuk, 2022). In addition, the catalogue was published in the USA, dedicated to the issues of Western Ukraine in the period 1918-1919. The author of this catalogue is I. Kuzych (2024), a well-known philatelist with over 450 publications. He collaborated with the editors of the R.L. Scott catalogues to review and expand the entries related to Ukraine. These publications and initiatives reflect the growing international interest in Ukrainian postage stamps and their role in the modern world.

The analysis of the source base of the study allowed strengthening the statement about the relevance and popularity of the postage stamp, which acts as a relay and identifier of Ukrainian culture. Similarly, Ukrainian users react to the design of postage stamps of other countries, assessing the theme, colour palette, graphics, and stylistic features that reflect the differences of one country from another. National messages in stamps form analytical categories.

The visual and content of this graphic product is largely becoming an important identifier and image of state identity, which distinguishes a certain historical and cultural originality against the background of the rapid process of socio-globalisation. The purpose of the study was to substantiate a generative and competitive approach to the design of Ukrainian postage stamps as a form of visual communication, based on progressive methods of transformation and interpretation of authentic meanings and serving as a means of promoting high visual culture.

## MATERIALS AND METHODS

This study focused on the phenomenon of dynamic development and actualisation of stamp design in Ukraine. Therefore, the formation and selection of the methodological framework were based on the use of atypical methods for art history. The task of the study was approached through the paradigms of social constructivism and visual sociology, which emphasised the inherent specific image (design), the importance of graphic identification of a postage stamp, which reflected the state of society, its moods, and worldviews. The methodological basis of the work was the historical and art historical approach and sociological content analysis of visual representations of postage stamps in the Ukrainian production of the early 21<sup>st</sup> century. The system of general scientific research methods involved the integrated application of art historical analysis, historiographical analysis, and static, comparative analysis of production and current trends in the design of modern patriotic postage stamps in Ukraine.

Two main stages were identified to achieve the goal and objectives of the study. The first stage is the formation of a brief historiographical background on Ukrainian stamp production, the state, features, and prospects



artists on postmarks received international recognition multiple times. Various themes and a wide range of graphic-identifying factors and means were covered in terms of thematic directions (Baranevych, 1995; Radomska & Holovata, 2020). A remarkable contribution to the development of Ukrainian postmark identification, particularly in depicting iconic figures of patriotic-national resistance, Ukrainian cultural and artistic figures, church leaders, ethnic culture, and traditions, belongs to the initiative of the Ukrainian Philatelic and Numismatic Society (UPNS) in Toronto, Canada, led by Vsevolod Sokolyk, a Ukrainian diaspora activist. In thematic context, two main groups are highlighted: the portrait group of prominent figures in the liberation movement and leading dignitaries of the Ukrainian Greek Catholic Church, whose Ukraine-centric activities were antagonistic to the Soviet ideological regime (Chyhrynets, 2023). Currently, there is an evident interest in and revitalisation of postmark design in graphic design, as demonstrated by student design projects. The issues related to postmark design have become the subject of research and graphic developments in bachelor's and master's degree qualification work by Julia Kudlak, a student at the Department of Design and Art. Two series of postmarks were developed: Traditional Breast Decoration for the Zerno women's clothing brand and the Roksolana Shymchuk Ethno-Gallery, and a series called Ukrainian Ethnomotives (Fig. 2)

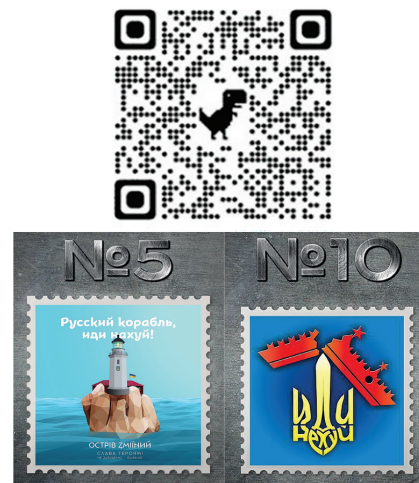


**Figure 2.** Yuliia Kudlak, 2016, 2018. Diploma project: Graphic development of a series of postage stamps, supervisor Violetta Radomska

**Source:** Archive of the department DOA IARD (2016; 2018)

Various methods of interpreting the ornament segment with contemporary graphic techniques have been applied. Graphic techniques like polygonisation

(Low Poly) and playing with colour channels, which are widely popular among designers, have become practical tools in graphic design. This method allows for creating large illusionary effects (Colour channels), colourful gradients, and overall vectorisation of images. Historiographic analysis indicates the need to create a contemporary postmark filled with content, featuring maximum aesthetic authorial graphic visualisation and artistic-technical compositional approaches, as well as an emotional component that would force it to attract attention not only as proof of postage payment but also as an artistic value of small-scale graphic work. In March 2022, less than a month after the start of the full-scale Russian aggression, Ukrposhta announced a competition for the creation of a postmark on the topic of the war on its Facebook page, which has 124,000 followers. Out of 500 submitted variants, Ukrposhta selected 20 sketches that were presented for voting (Fig. 3).



**Figure 3.** Ukrposhta, 2022. Sketches of the competitive selection of postage stamps “Russian ship go to #uy!” **Source:** according to materials of Ukrposhta (2022a), M. Makar & V. Savka (2023)

The numerous implementations of newly created brands testified to the prospects and needs of society in the creation of this segment of graphic products. Postage stamps are an effective element and one of the state-building means of reflecting the authenticity and depth of Ukrainian culture, historical reality, architectural and artistic heritage, prominent figures, and heroes of modern independence. Historiographical analysis confirms the need to create an actual brand, filled with content, with the most aesthetic author's graphic visualisation, artistic and technical compositional approaches, and with an emotional component that would make people pay attention to themselves again, both as a receipt for payment of postage and for the artistic value of a work of applied graphics of small forms.

This is evidenced by a number of factors that are subject to analytical statistics. The experience of public

voting at the stage of the draft development of stamps during the war, the results of the initial statistics, became an important scientific source and tool on the way to the implementation of the design project. Such an example was witnessed by Ukrposhta when it presented design sketches of a number of patriotic stamps for public discussion. In general, during the competition for the best sketch for the postage stamp “Good evening, we are from Ukraine!”, more than 1,500 works

were received. For the final vote, the expert council of “Ukrposhta” selected 5 authors’ works – different in content, style, and mood. As the press service of the competition stated, 834,000 people took part in the voting, more than 340,000 respondents chose the sketch composition with a tractor pulling a destroyed Russian tank, second place was taken by a sketch with Putin, and third with the leader of the Kalush band (Fig. 4) (Gordiychuk, 2022).

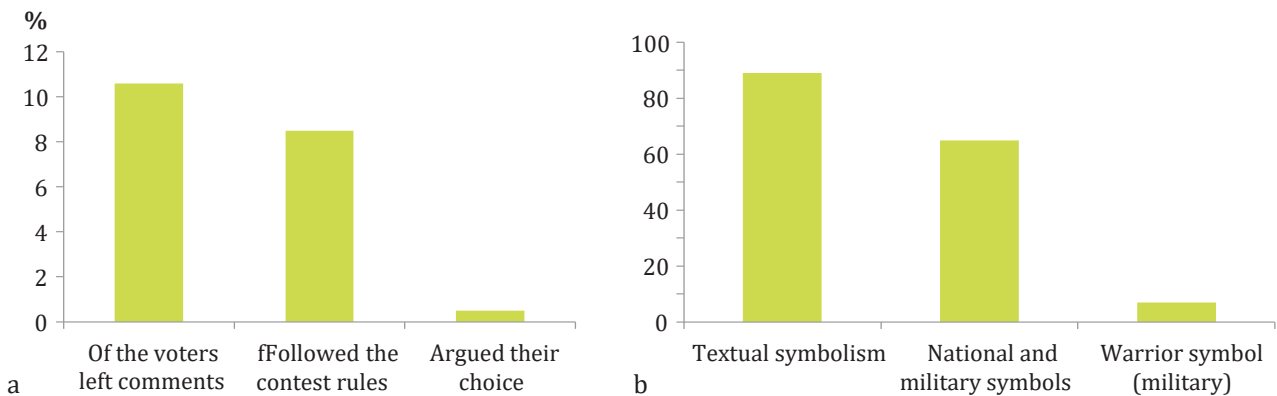


**Figure 4.** Competitive variants of draft proposals for the issue of the stamp “Good evening, we are from Ukraine”, 2022

**Source:** according to the materials of Ukrposhta (2022a)

Participants in the voting chose the sketch for the first postmark of the liberation war. Voting was conducted by pressing the like button and leaving a comment with the number of the chosen postmark. Ukrposhta immediately determined that all sketches should contain a distinctive and meaningful message (the defence of Zmiinyi Island), although an unusual one for public

communication: *Russkiy voyenny korabl', idi na#uy!* (Makar & Savka, 2023). Analysing all the comments, including those that do not directly provide arguments for the choice, two consistent branches were identified: Commentators’ behaviour (Fig. 5a); Formation of the social construct (Fig. 5b). An online survey form was created for more than 200 respondents to create a social construct.



**Figure 5.** Components of a social construct

**Note:** a – commentators’ behaviour; b – formation of the social construct

**Source:** developed by M. Makar

The winning postmark and the argumentation for its choice provided confirmation that Ukrainians

showed respect for the cultural tradition embodied in the coat of arms and the colours of the flag (Fig. 6).



**Figure 6.** Ukrposhta, 2022.  
Postmark No. 3 is the winner

**Source:** developed by the authors according to materials of Ukrposhta (2022a)

Obscene language on a state postmark faced criticism, but the essence of the message and the country's stance were conveyed through the characteristic gesture, which is entirely understandable without words and served as a compromise for participants in the contest who had different views on capturing and immortalising an obscene message. Differences in the formation of certain elements of the social construct indicate that the choice was made by people from different sociocultural backgrounds who still shared a completely unanimous view on the Russian-Ukrainian war. Thus, traditional and modern elements, typical of pop culture, are combined in the graphics and content of the postmark (Makar & Savka, 2023). The historical events and realities of Ukrainians have highlighted the need for patriotic thematic identification in the design of postmarks. The dynamic emergence of new symbols of heroic struggle has been captured and enshrined in a series of developments, representing an important stage in the modernisation of graphic products for the needs of Ukraine's postal service and philatelic enthusiasts. Modern postmarks from 2022 to 2023 serve as instant visual identifiers and retransmitters of relevant events, the achievements and resilience of the Armed Forces of Ukraine, social consciousness, courage, and the historical struggle of the Ukrainian state for independence and democratic values. The production of newly created postmarks in large numbers has demonstrated the prospects and societal needs for this segment of graphic products. Postmarks are an effective element and one of the state-building tools for reflecting the authenticity and depth of Ukrainian culture, historical reality, architectural and artistic heritage, prominent figures, and heroes of modern independence. The relevance and actualisation of issuing postmarks during the full-scale Russian-Ukrainian war in Ukraine have reached unprecedented levels. The terrifying realities, complex geopolitical struggles and victories, the courage and resilience of Ukrainian society, the heroic resistance of the Ukrainian Armed Forces, and the mobilisation of society in the establishment of Ukrainian statehood all become a source of inspiration

and the subject of project ideas for prominent graphic artists and designers who are consciously committed to their creative work. In 2023 a series of postmarks titled Unconquered Heroic Cities from the Ukrainian Liberation War of 2022-2023 became the thematic and visual foundation for the conceptual design of a postmark series for the diploma project of Anna Shyshuta (DS-42), a student at the Department of Applied Design of the Lviv Polytechnic National University. This demonstrates the dynamics and trends in the development of the applied segment in modern Ukrainian graphic design, particularly in the design of postmarks (Fig. 7).



**Figure 7.** Anna Shyshuta, Graphic design of the Unconquered Heroic Cities series of postage stamps, 2023 (diploma supervisor V. Radomska)  
**Source:** Archive of the department DOA IARD (2023)

The statistics from the social game Postcrossing were analysed, which covers 209 countries with 804,532 users (Countries and territories in Postcrossing, n.d.). This game was created by Portuguese enthusiast Paulo Magalhães in 2005, who enjoyed receiving paper postcards. Over time, the game quickly attracted participants from other countries, where people eagerly checked their physical mailboxes, hoping to receive greetings, possibly from the other side of the world. The adrenaline of surprise and receiving a gift is the emotional foundation that motivates people to share a piece of themselves and eagerly receive something different and diverse. All data were obtained and monitored from the official Postcrossing website, where it was determined that Ukraine ranks 9<sup>th</sup> in terms of the number of users (Countries and territories in Postcrossing, n.d.), with 25,925 Ukrainians being postcrossers

(Ukraine in Postcrossing, n.d.). Consequently, postcards from Ukraine account for 2.2% of the total worldwide postcards, placing Ukraine among the 15 most active countries in correspondence, including Germany, the USA, Russia, the Netherlands, Finland, China, Taiwan, Belarus, the Czech Republic, Japan, Poland, Ukraine, the United Kingdom, France, and Canada (Statistics: Postcrossing in numbers, n.d.). These analytical conclusions are one of the indicators that Ukrainian postmarks actively visit other countries and create a visual presentation of Ukrainian state. With the help of postmarks, engaging in cultural dialogues and informing the world about Ukrainian resilience and the importance of breaking away from the colonising country is possible. The importance of postmarks is demonstrated by the design of postmarks from foreign countries on the Ukrposhta website, which thus spread messages of support for Ukraine and condemnation of the aggressor country in 2022-2023 (Fig. 8). In particular, as of 2023, more than 15 countries have joined this process: Latvia, Estonia, Poland, Austria, Croatia, Moldova, Lithuania, Czech Republic, Luxembourg, Spain, France, Canada, Slovakia, Portugal, and Italy.



**Figure 8.** Postage stamps from all over the world in support of Ukraine, 2023

**Source:** developed by the authors according to Ukrposhta (n.d.)

Based on sociological studies of the modern dynamics and revival of postage stamps, it is necessary to evaluate and provide arguments for the design features of postmarks, their importance, and artistic and design content. According to the authors, the popularity and large print runs of Ukrainian postage stamps do not always represent a high level of compositional and graphic individuality and a special approach to the creation of more complex and philosophically refined symbols, the culture of graphic or painterly design language. These are obvious factors because the dynamic events and phenomena, as well as the emotional and stressful state with which society and its artistic and design segment have been confronted, do not always enable a deep search for symbolism and individual graphic format.

An important objective factor is the lack of consistent experience in the development of this type of graphic product, which still represents functional design with its requirements and necessary elements. These difficulties are also encountered in student design projects, where a fascination with visual identity often marginalises the overall composition and readability of the finished product, the arrangement of necessary components – typographic elements, denominations, etc. The positioning of a postmark as a printed product is a fundamental aspect to consider. The technique of postmark production did not emerge out of nowhere; it evolved from the ancient printing tradition used for producing banknotes and state papers. Therefore, the graphic language in which the artist creates the original postmark design becomes crucial. During the design phase, the printing technique determines the possibilities for applying a specific graphic approach. When using line drawing, the artist must convey the outline of objects and their plastic form exclusively through a system of lines arranged next to each other or intersecting lines. Tone drawing enables the artist to use different gradations of shading, varying the lighting or darkening of individual areas of the drawing surface to achieve a wide range of shades, from black through all shades of grey to white with smooth transitions between them, resembling a photograph. Most modern postage releases are in colour, but this does not mean that linear or tonal gradation is not considered in the construction of the artistic design. The study by N. Pantus & N. Zolotarchuk (2023) analysed the impact of graphic design on printing processes, emphasising the importance of visual elements such as colour, form, and texture. These insights are highly relevant to the design of Ukrainian postage stamps, where thoughtful colour choices play a key role in shaping national identity and enhancing visual communication. It is precisely through the use of different tonal or linear possibilities of drawing that artistic postage miniatures become more expressive. The artist chose one or another of the mentioned execution techniques, accounting for the specified printing technique, which indirectly affects the style of the image. The author can also combine both techniques in one miniature, allowing for the possibility of combining and using different technical printing methods for the same postmark, capable of conveying both line and tonal drawings. Additionally, there is the option of using relief printing, which allows for creating a raised, embossed, three-dimensional image on paper. However, this technique of colourless printing is relatively rare and is usually used in combination with another printing method for postmark production. There is no doubt that with the development of the printing industry and technological processes, new technical methods, materials, and possibilities emerge, and even old, long-forgotten ones resurface. These require serious creative consideration and mastery by

artists. Combined printing of postmarks using various types of printing techniques has gained popularity both in global philately and in contemporary Ukraine. Therefore, the theoretical and practical experience, monitoring skills, and the application of analytical methods for sociological analysis demonstrated in this paper should be considered and applied in future design projects. In the future, it is important to focus on the analytical and constructive analysis of the artistic and design components of contemporary Ukrainian postmarks. Based on this analysis, vectors and thematic priorities for the design approach to creating high-quality samples of visual identification for postmarks of Independent Ukraine, testifying to the victory and triumph of the European state, should be determined.

The subject raised in this study conceptually coincides the most with the main discourses of the fundamental work of H. Hoyo (2010). The author believed that in the future, given the conclusions of the historiographical examination of analogues of postage stamps, preference will be given to postage stamps with more neutral and global themes – supranational, cosmopolitan content. Messages in stamps of this type advertise or refer to topics that are essentially universal or at least supranational, either by their own nature or by the way they are presented in the final version. In this sense, the visual content appeals to ideas of design, values, or development that are considered desirable or useful for people or wider regions, communities. This category includes stamps that named “humanity” literally or through symbols and are revealed with an internal universal character. For this typological characteristic: depictions of maps, globes, in particular, where political borders are erased; messages about human rights; problems of a universal scale, such as pollution or climate change; phenomena that promote certain values and attitudes as desirable and universal (friendship, tolerance, eco-communism); promotion of peace or issues of arms control (Hoyo, 2010). This category includes postage stamps dedicated to organisations or events that promote any aspect of supranational integration (political, humanitarian, cultural, sporting, technical), and messages where the issuing state supports, sponsors, or celebrates such values, events, or institutions. Stamp images that present certain aspects, persons, or things as having universal human value are also considered: for example, when ideals or achievements concern individuals, groups, or institutions, are depicted as “standing for” or benefiting humanity. This also applies to places, objects, environments, traditions or cultural features that are considered to be representative, part of the heritage, or even belonging to all humanity (for example, objects under the protection of UNESCO), but only as long as such a symbol is clearly indicated on the stamp. Surely, such a theme is a promising path of development. However, the authors of this study, operating on the real state of stamp printing

dynamics and data from Ukrainian authors (Bokareva, 2008; Gurtova, 2016; Potylchak, 2021), believe that such idealised themes do not yet lead to an important informative state-building identification of Ukrainian stamps. In the context of the modern reassessment of imperial narratives about history and ethnocultural context, the Ukrainian stamp should be a high-quality retranslator of extremely thoughtful visual material, which needs to be classified and qualitatively supplemented, relying on the reliability and authenticity, appropriate transformation and modern stylisation of the original source.

The development of stamp production in the Ukrainian SSR represented a “Ukrainian stamp”, which literally concerned the asymmetrical political relations between the centre of power and the “given territory” with certain distorted narratives about the cultural, ethnic or ideological superiority of the former. Most of such stamps explain the power hierarchy, demonstrate political symbolism, while the key figures are local representatives of the imperial power (rulers, party members, and cultural figures). Another group presented more subtle images related to symbols, natural features, and official culture (Bekhtir, 2000; Radomska & Holovata, 2020). The main part of the products belonged to the theme, where the visual image of the stamp demonstrates power, asserting its dominance over the territory or even a puppet state. Given these complex historical circumstances, the study expresses the standpoint that the correctly emphasised content of a postage stamp can influence the formation of the social construction of a renewed Ukrainian society in the perception of state positions. The postage stamp will become a relevant subject of modern design – an elegant miniature with a wide range of content and stylistic culture.

In the context of investigating Ukrainian postage stamps, it is important to note that statistical data, monitoring of issuance dynamics and thematic direction, as well as information about awards received at international competitions, are available in open sources (Ukrposhta, 2022b; Ukrposhta, n.d.; Alley of postage stamps, n.d.). However, the availability of only quantitative indicators and surface-level analysis does not provide a complete understanding of the artistic and visual specifics of postage stamps as a design object. Therefore, there is a growing need for systematic scientific research focused on stylistics, visual language, means of graphic expression, and aesthetic trends.

Each year, Ukrposhta, in cooperation with European postal administrations, participates in the issuance of postage stamps under the Europa programme. The 2022 theme of the programme was “Stories and myths”. Continued participation in this initiative is of strategic importance for Ukraine, as it enables the promotion of national culture, art, and creative talent on the international stage (Ukrposhta, 2022b). Ukrainian postage stamps have repeatedly received recognition in the

PostEurop competition. In 2019, the stamps themed “Birds” – “White stork” and “Eastern nightingale”, designed by N. Kohal, were awarded gold in the “Best postage stamp of Europe 2019 – collector’s choice” category. In 2020, the stamp “Postman Fedir Feketa”, themed “Ancient postal routes” and illustrated by I. Medvedovska, received silver in the “Best postage stamp of Europe 2020 – jury’s choice” category. In 2021, the stamp “Cry of the Carpathians” was awarded bronze (Ukrposhta, 2022b). These distinctions confirm the high artistic and cultural value of Ukrainian postage stamps within the European context.

## CONCLUSIONS

The dynamic implementation of newly created postmarks confirmed the prospects and societal needs in this segment of graphic production. Postmarks constitute an effective element and one of the nation-building means to reflect the authenticity and depth of Ukrainian culture, historical reality, architectural and artistic heritage, prominent figures, and heroes of modern independence. On the path to solving the task of forming an objective state of development for Ukrainian postmark printing, an analysis of the social construct embedded in the design and visual culture of postmarks during Russia’s full-scale aggression against Ukraine became fundamental.

In the process of interpreting the importance of the design of Ukrainian patriotic postmarks in global society, the dynamics of design projects’ development, their static component, and the mechanism of competitive selection were analysed. The practical implementation of work on postage miniatures by design students from the Department of Design and Fundamentals of Architecture at the Lviv Polytechnic National University was also examined.

In the context of the development of all components of state identification, postage stamps are a necessary element. This created a permanent precedent for further scientific research into the development of Ukrainian stamp issuance and the prospects for creating postage stamps of Ukraine that are increasingly more relevant in design and aesthetic content context.

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In terms of prospects, the postage stamp may occupy a fairly substantial segment in the variety of fine art products of applied graphics in the design of higher educational institutions with specialised departments in the B2 Design speciality. The historiographical analysis demonstrated the need to create an up-to-date postage stamp, a smart digital postage stamp filled with meaning, with the most aesthetic author’s graphic visualisation and artistic and technical compositional approaches, as well as an emotional component that would ‘force’ attention not only as proof of postage, but also as an artistic value of a small-format work of applied graphics.

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## **Дизайн української патріотичної поштової марки як ідентифікація держави у світовій глобалізації**

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**Анотація.** У період пошуку державної ідентифікації візуальна культура поштових марок відіграє важливу соціально-патріотичну складову репрезентації особливостей держави та історичних подій у контексті глобальної геополітики. Основна мета дослідження – визначити синхронність соціальних конструктів, поглядів, колективних уявлень українців із дизайном української патріотичної марки. У дослідженні використовуються загальнонаукові історіографічні та спеціальні методи. Аналіз соціальної гри Postcrossing показав, що поштові марки та епістолярний стиль зазнають значної трансформації та популярності в суспільстві та за його межами, що суперечить трактуванню «архаїчності поштових марок». Встановлено, що суспільний попит якісно вплинув на динамічний розвиток випуску марок в Україні. Оголошення конкурсів на вибір оптимального та актуального дизайну поштової марки підтвердило досить стійке позиціонування цього сегменту графічної продукції як інструменту державотворчої візуальної комунікації. Динаміка інтересу та актуальності дизайну поштової марки відображена у виконанні низки високохудожніх робіт, зокрема дипломних робіт студентів кафедри дизайну та основ архітектури НУ «Львівська політехніка». Дизайн-проекти продемонстрували, що в цьому типі візуальної культури важливо враховувати три основні компоненти: функцію з її специфічними стандартами та вимогами, тему та пошук відповідної і чітко визначеної образної, стилістичної мови. За умови врахування цих сегментів у проектуванні поштових марок, вони виконуватимуть не лише функцію державного знака, а й сприятимуть формуванню цілісної айдентичності України, адаптованої до глобального простору

**Ключові слова:** поштовий знак; посткросинг; візуальна культура; глобальне суспільство; дизайн-проект; ідентичність



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## The cultural and artistic environment of Transcarpathia in the interwar period and its influence on E. Konratovych

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**Abstract.** The research relevance is determined by the need to determine the impact of the complex socio-economic circumstances of the interwar period and the cultural revival of Transcarpathia on the formation of Ernest Konratovych's creative outlook. The study aimed to analyse the formation and rise of the cultural and artistic centre in Transcarpathia and to characterise its influence on E. Konratovych. The methodology involved the use of historical, biographical, analytical, and several art historical methods, which were used to comprehensively characterise the historical context and development of the cultural sphere in Transcarpathia during the specified chronological period. These methods were also used to analyse the artistic environment of E. Konratovych and demonstrate its impact on the selection of themes and motifs in the early stages of creative career. The article examined the development of the cultural environment in Transcarpathia during the interwar period, which influenced the formation of Konratovych's artistic style and the selection of subjects and themes in the early phases. A significant amount of factual material was gathered concerning the artistic and cultural life of Subcarpathian Rus in the 1920s and 1930s. The influence of the environment on Konratovych's thematic choices and the development of the plots was substantiated. The conclusions drawn from the research contribute to determination of the development of cultural and artistic processes in Transcarpathia in the 20<sup>th</sup> century. A substantial portion of the historiographical and factual material is valuable for scientific research, museum work, and the creation of textbooks, curricula, and lecture courses

**Keywords:** Subcarpathian Ruthenia; school of painting; society of contributors to the fine arts in Subcarpathian Ruthenia; interwar period; regional identity

### INTRODUCTION

The events of the interwar period in the territory of Transcarpathia (1919-1938) were reflected in detail in the works of Ernest Konratovych (1912-2009), who began artistic career during this time. Author's worldview, shaped by the complex socio-economic conditions of the era, was embodied in several original artworks. The population of Transcarpathia was experiencing the consequences of the global economic crisis, which brought mass unemployment, emigration, famine, and

widespread social suffering. These observations were captured in early works – genre compositions depicting the destitute, beggars, and vagabonds who crowded the roads, church porches, and streets of the region. At the same time, despite the tragic realities, the 1920s-1930s marked a period of favorable conditions for the development of Transcarpathia's cultural and artistic environment. This era was characterised by a cultural revival and the renewal of national traditions. Therefore, it

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is necessary to explore the processes of formation and development of this cultural milieu to identify the key events and factors that influenced the artistic evolution of Ernest Kontratovych.

The cultural and artistic environment of 1930s Transcarpathia was examined by O. Rebryk & A. Rebryk (2024). The study demonstrated how the political and social transformations of the period influenced the formation of the local intelligentsia and shaped its engagement with the literary sphere. The artistic legacy of E. Kontratovych was analysed in the publications of A. Cheipesh (2020; 2023). The study conducted a thorough and comprehensive examination of a substantial body of the artist's oeuvre, with an emphasis on the influence of external sociocultural factors on the selection of themes and subjects in the paintings. M. Syrokhman (2020) conducted an in-depth study of the lives and creative paths of ten prominent artists of the Transcarpathian School of Painting, who successfully integrated leading European artistic trends with the painting traditions of the Carpathian region. Art historian O. Havrosh (2022) conducted research on the history, formation, and various aspects of the development of the Transcarpathian School of Painting, as well as on the individual contributions of its representatives. The studies also explored the interactions among local cultural and artistic figures, including I. Chendey, A. Erdeli, and V. Mykyta.

Art historian V. Manailo-Prykhodko (2024) consistently explored the work of Fedir Manailo, one of the leading figures of the Transcarpathian school of painting. Comprehensive studies by Manailo-Prykhodko revealed essential aspects of the artist's creative legacy and life. The interest in the art of Transcarpathian artists remains relevant. Contemporary scholars explore various aspects of the region's visual arts, particularly sacred painting. H. Sklyarenko (2021) investigated the role of the Transcarpathian School of Painting in the revival of modernist tendencies in Ukrainian art during the post-Stalinist era. T. Ivanytska (2022; 2023) examined the development of the portrait genre in Transcarpathia, focusing on the works of A. Erdeli and Y. Bokshai, with emphasis on the influence of the natural environment and European artistic education. Additionally, author explored the portrait painting of the second half of the 20<sup>th</sup> century through the works of artists such as A. Kotska, V. Mykyta, I. Ilko, and F. Seman, interpreting their artistic output as a means of personal self-identification.

The study aimed to analyse the development of the cultural and artistic centre in Transcarpathia in the interwar period and to characterise its influence on the formation and evolution of Ernest Kontratovych's creative personality.

## **MATERIALS AND METHODS**

One of the main sources used in the study is materials from the book M. Vegesh & Ch. Fedinets (2010). The

study highlighted the path of development of various social and cultural spheres of life of the population of Transcarpathia in the specified period. The book contains significant factual material presented in an unbiased light. The archival materials were used to recreate a complete picture of the development of Transcarpathia's culture and the local art school. Information in the monographs of the founders of the Transcarpathian school of painting and active figures of culture such as V. Martynenko (1973) and I. Nebesnyk (2007) expanded knowledge about the conducting of important cultural events, in particular, the holding of exhibitions and plein airs, the organisation of the educational process in Uzhhorod and the founding of artistic associations and unions. This was also described by A. Erdeli (2012), F. Erfan (2016). These events were also covered in the press at that time. Art historians and critics conducted a professional review of cultural and artistic events in magazine and newspaper articles.

An analytical method was used to determine the topic's state of development; bibliographical, archival, and factual material was analysed using a systematisation method. The historical method was used to analyse the historical situation and cultural and artistic environment in which the artist's creative personality was formed. The biographical method was used in the reconstruction of the main life events of the artist. To analyse the creative work of E. Kontratovych, a range of art historical methods was used, such as iconographic, artistic and stylistic, and comparative methods. The generalisation method was used to form conclusions for the conducted research. The aforementioned research methods were used to comprehensively characterise the historical context, and the development of the cultural sphere in the territories of Transcarpathia in the specified chronological period; to analyse the artistic environment of E. Kontratovych and prove the influence on the choice of themes and plots in the works of the early period of creativity.

## **RESULTS AND DISCUSSION**

### **Education, art, and nation-building in interwar Transcarpathia**

The first mention about Transcarpathia (until 1919, the modern territory was called Hungarian Ruthenia) in the chronological framework of modern history is associated with the Habsburg Empire, which in the early XX century was on the verge of collapse. The destruction of the vast political system called Austria-Hungary, and its multinational population led to the outbreak of World War I, which brought several new states to the world stage, including the Czechoslovak Republic. Transcarpathia became part of it, which influenced the political system of the region, its economy and culture. The government of Czechoslovakia attempted to bring Subcarpathian Ruthenia the European features (Subcarpathian Ruthenia is the name of the modern

territory of Transcarpathia during 1920-1938). The reforms conducted by the President of Czechoslovakia, T. Masaryk, contributed to the development of cities, the construction of roads, the improvement of living standards and cultural prosperity. The reforms also created a fertile ground for the development of regional art, which had a direct impact on the works of emerging artists, including E. Konratovych. The 1920s and 1930s were recognised as a time of emergence of the artistic achievements of the region. The literature of Transcarpathia experienced a significant rise. The Society "Prosvita" contributed to the development of theatrical art. The beginning of the formation of the Transcarpathian painting tradition also occurred at this time. A. Erdeli and Y. Bokshay developed the concept of art education of the region and taught young generation of talented artists. This environment, with strong cultural foundations, significantly influenced the young artists of the time, such as Konratovych, shaping approaches to art and thematic choices.

In 1919, under the Treaty of Saint-Germain-en-Laye, the territory of Transcarpathia called Subcarpathian Ruthenia became part of Czechoslovakia. The President T. Masaryk sought to give the new part of the republic the European features, hence several reforms, in particular, in the administrative, financial, tourism sectors in the 1920s-1930s, were conducted (Vegesh & Fedinets, 2010). The joining Czechoslovakia created new conditions for the development of the cultural environment of the region. These reforms laid the groundwork for a cultural awakening, which also influenced the intellectual and artistic development. Despite the economic stagnation, even within Czechoslovakia, these years were a "Transcarpathian cultural revival" due to changes in education, the development of national literature, the establishment of a permanent theater and the formation of the Transcarpathian school of painting. The educational reform of the 1920-1930s contributed to the opening of new schools (from 475 primary schools, 321 were with the Ruthenian language of teaching), and the introduction of new subjects and books (Vegesh & Fedinets, 2010). The opening of new schools and the improvement of educational standards provided better access to artistic education and new artistic concepts for the young generation.

The issue of higher education was problematic, as it was received in Prague, Bratislava, Munich, and Budapest. Doctors, scientists, high school teachers graduated from local educational institutions. However, this was not enough, and therefore the progressive public of the region raised the question of opening local higher educational institution – the University of Subcarpathian Ruthenia. However, the government of Czechoslovakia argued that Subcarpathian Ruthenia has no conditions for the development of higher education (Vegesh & Fedinets, 2010). The Uzhhorod singing and teachers' seminary, headed by A. Voloshyn was the exception. The

institution annually graduated 40-50 priests, who also taught and actively participated in cultural life. In particular, among the seminarians were the students of the Public School of Drawing – A. Kotska, E. Konratovych, A. Boretskyi and Z. Sholtes (the only minister of a religious cult and an artist at the same time). In general, the reform of education in Transcarpathia contributed to a quantitative growth of the intelligentsia, which affected the overall increase in the cultural level of the region. The formation of professional theater is associated with the activities of amateur theater groups. The groups in Beregovo and Uzhgorod particularly stood out among them. In 1920, with the assistance of the Society "Prosvita", the "Ruthenian theater" was opened in Uzhgorod. The next theater was headed by a prominent Ukrainian theatrical figure M. Sadovskiy, who helped the theater to become professional.

#### **Cultural and artistic events of Subcarpathian Rus in the 1920s**

The organisation of the local art center was associated with several problems: the lack of vocational art education institutions and the required number of teachers. O. Izvorin (1942) characterised Transcarpathia prior to its incorporation into the Czechoslovak Socialist Republic as a region where Verkhovyna functioned not solely as an artistic movement but as a holistic cultural phenomenon rooted in a way of life centred on artistic practice. The area attracted artists, motivated by the status of a locus of creative inspiration. Nevertheless, despite its cultural significance, visits by artists were relatively sporadic, and many of those who did come were primarily driven by the necessity to earn a livelihood, frequently through the production of religious iconography.

Regarding the sacred art of Transcarpathia, Professor M. Pryymych (2017) emphasised that the tradition of church painting was at the origins of the visual tradition of the local school. The study proved that the preserved monuments of fine art provide substantial evidence that highly skilled and professionally trained painters were active in the region over an extended period. Therefore, the absence of any movement in the field of art is noteworthy. At this time, artists who lived in Transcarpathia – S. Beregi, D. Virag, K. Izai, in 1917, organised "Club of Artists" (another name "Mukachevo Club of Artists"), which included S. Beregi, Y. Bokshay, D. Virag, E. Grabovskiy, A. Erdeli, D. Iyas, K. Izai. Due to their fundamentally conflicting views on the purpose of fine arts, the group managed to hold just three exhibitions before dissolving – in Mukachevo, Beregovo, and Kosice (Vegesh & Fedinets, 2010).

The next step in uniting the creative forces was the exhibition initiated by A. Erdeli and Y. Bokshay. On January 1-9, 1921, the works of Transcarpathian and Kosice artists were presented in Mukachevo, and later in Beregovo, Kosice, and Uzhgorod. The works of the above-mentioned artists who revived the "Club of Artists of Subcarpathian Ruthenia" were exhibited.

This group organised one exhibition in 1922, but could not provide a significant impetus for further intensive development (Gapak, 1975). G. Ostrovsky (1974) explained the reason for the unsuccessful attempt as follows: the concept of national art was not universally accepted among Transcarpathian artists, as individual ambitions and limited professional interests often prevailed over broader ideological or cultural imperatives. During the 1920s Transcarpathia, its unusual ethnic group and folklore were “discovered”. With the assistance of the Czechoslovak government, several exhibitions were held, demonstrating the items of folk art and life of the Ruthenians. The most famous was “Art and Life of Subcarpathian Ruthenia” (1924), organised by critic S. Makovskyi in Prague. The great success of the event, the positive reviews of critics, the album, publishing in three languages was the evidence of interest in the presented exhibition (Ostrovskyi, 1974).

The large numbers of Ukrainians living in Prague and Bratislava expanded and strengthened the cultural and artistic ties (Boiarchuk, 1993). Education and, in addition to secondary schools, were emphasised, as in Prague, at that time, there was a single Ukrainian art higher educational institution – the Ukrainian Studio of Plastic Arts (USPM), which was known in Prague and abroad for its regular exhibitions. The professional education provided by the Ukrainian Studio of Plastic Arts in Prague was central in fostering the national self-awareness and ethnic identity of its youth (Dzhus, 2015). In the 1920s and 1930s, obtaining a professional art education was a significant problem in Transcarpathia. The absence of an art institution prompted the founders of the Transcarpathian school of painting A. Erdeli and Y. Bokshay to discuss its creation. They were inspired by the ideas of the Barbizon painters, their entry into the plein air, S. Hollosy and K. Ferenczy. After graduating from the Hungarian Royal Art Institute in Budapest, A. Erdeli and Y. Bokshay returned to Uzhgorod and both began to teach. A. Erdeli became a teacher of drawing at the Mukachevo Teachers’ Seminary (1916), later at the Mukachevo Real Gymnasium, and Y. Bokshay taught geometry at the Uzhgorod Gymnasium (1918). Researcher of art education in Transcarpathia I. Nebesnyk (2000) considered that the early stages of the establishment of art education in Transcarpathia were directed toward meeting the cultural and educational needs of the region’s Ukrainian population.

In the 1920s-1930s, Erdeli sought self-fulfillment more as an artist than as a teacher. From 1922 to 1931, the artist traveled to Europe (Germany, Switzerland, Italy, and France). For four years, A. Erdeli lived and worked in the workshops of Munich, presenting in 1923 works in the most prestigious exhibition hall – “Glaspalats” (“Glass Palace”). The result of A. Erdeli’s creative work during the stay in the above-mentioned cities was numerous paintings that were later presented at exhibitions in Prague (1927), Brussels (1929), Paris (1930),

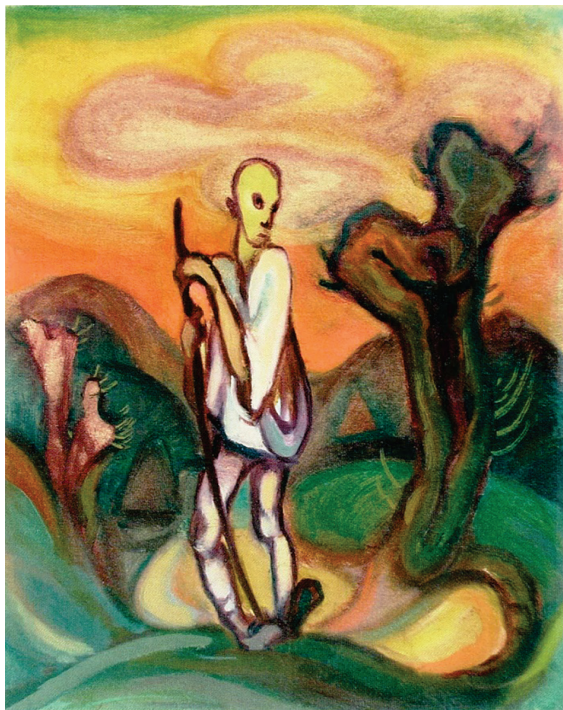
Bratislava (1936), and Uzhhorod (1930s). In the 1920s, Y. Bokshay exhibited personal works at the exhibitions in Czechoslovak cities – Prague, Brno, and Bratislava. The first personal exhibition of the artist took place in Prague in 1926. And during 1930-1931 the author visited Italy, France, Yugoslavia, Switzerland and Germany, studying the works of old masters, whom he always set as an example to follow (Ostrovskyi, 1974; Erfan, 2016).

On the initiative of A. Erdeli and Y. Bokshay, in 1927 the Public School of Drawing began to function in the classes of the Uzhgorod Teachers’ Seminary on weekends. Talented seminarians were invited to study at the school. Students listened the lectures on the history of art, attended creative disciplines: drawing, painting, plastic anatomy, basics of perspective, worked with naked nature and plaster. Open-air classes were a compulsory element of this school. It is possible that on the classes, one of the students, E. Konratovych, invented a method of creating a landscape, which was unchanged throughout the creative path. As the state of nature changed, the artist tried to quickly “catch” the main part of the painting, and the sky and the foreground were completed in the studio. After three years of study, the school released the first cohort of professionally trained artists – A. Kotska, E. Konratovych, A. Boretskyi and Z. Sholtes, who confidently continued the picturesque traditions of mentors.

#### **Activities of Subcarpathian artists in the 1930s**

There were more and more followers of the idea of creating the “Subcarpathian Barbizon”, so in 1931 the “Society of Contributors to the Fine Arts in Subcarpathian Ruthenia” was founded – an organisation that involved artists, including students of “Public School” in artistic life. As of 1932, the organisation had thirty-eight members. A. Erdeli was elected as the chairman, D. Endredi as the deputy, L. Kaigl as the secretary, A. Dobosh as the cashier, F. Manailo as the curator (Havrosh, 2017). The society brought together the artists of different nationalities. O. Izvorin (1942) emphasised that the main one was the “Ruthenian core”: Y. Bokshay, I. Dvan-Sharpotoki, A. Erdeli, I. Erdeli, A. Boretskyi, A. Dobosh, A. Kotska, E. Konratovych, and Z. Sholtes joined the Society in different years. Their formation was grounded not in national, specifically Ruthenian principles, but rather in artistic and ideological convictions; they wholeheartedly embraced the idea of discovering the soul and stylistic essence of their people and native land. The first exhibition of works by members of the organisation took place in 1931 at the Uzhhorod Jubilee Czech Folk School named after T.G. Masaryk. In 1936, with the support of “Society of Friends of Subcarpathian Ruthenia”, an exhibition of works by artists of the Society was held in Bratislava, presenting 95 works by nineteen artists. In 1937, the exhibition “Slovakia and Subcarpathian Ruthenia –people and the land in fine arts” took place in Prague. The local Subcarpathian school was represented by Y. Bokshay, V. Dvan-Sharpotoki, A. Erdeli, I. Erdeli,

A. Kotska, Z. Sholtes (Nebesnyk, 2007). Possibly, E. Konratovych also participated in the exhibition activities of the Society. After joining the Society of Contributors to the Fine Arts, Konratovych participated in art exhibitions from the late 1930s to the early 1940s with works of pronounced social critique, earning recognition as one of the most incisive voices expressing rebellious sentiment among Transcarpathian artists (Myshanych, 2010). Early works of E. Konratovych reveal the acute social problems in the life of the Transcarpathian people of the 1930s. They are devoted to the themes of begging and disability (“Grandfather – Cripple”, 1937; “Beggars”, 1930s), poverty (“Hunger”, 1937), unemployment (“Unemployed Tramp”, 1938), death (The Funeral of the Poor, 1939; “Ruined House”, 1938). The image “Grandfather – Cripple” depicted an old man with twisted legs standing at the edge of a village (Fig. 1). Next to the old man is a hollow willow tree, within which the silhouette of a crucifix is present. The colour scheme is based on the contrast between warm-toned shades in the sky and cool greens of varying brightness and saturation. The overall palette is muted and subdued, and, combined with the distinct brushstrokes, provides the impression of a graphic work.



**Figure 1.** Grandfather – Cripple. 1937.  
Cardboard, oil. 65x45

**Source:** Private collection

The unnatural pose of the old man, dressed in white and leaning on a long staff, stands out against the background landscape. The figure, along with the depiction of the sun veiled by a strange cloud, reappears in a later work “Beggars” (Fig. 2).



**Figure 2.** Beggars. 1930s. Cardboard, tempera. 70x49  
**Source:** Private collection Umansky family collection (n.d.)

In the artist’s most renowned work, “The Funeral of a Poor Man” (1939) (Fig. 3), a multilayered composition was employed to unfold the painting’s narrative – a funeral scene taking place in the courtyard of a Hutsul village home. The asymmetry created by shifting the group of peasants holding church banners to the left adds a sense of movement, further emphasised by the figure of a woman walking across the yard. At the center stands a traditional Hutsul house, while the mountainous landscape in the distant background serves as a static backdrop for the slow, deliberate motion of the funeral procession. This contrast between movement and stillness underscores the indifference of the natural world to human sorrow. The colour palette is restrained and closely toned, with no vivid highlights. The peasant group and the woman are subtly distinguished by a muted light-brown hue. The subdued lighting and somber tones reinforce the ordinariness and quiet sorrow of the depicted event.

The works feature a marked sense of suffering and alienation from the world, because despite the reforms, the Czechoslovak government failed to solve the problems reflected in the above paintings (Cheipesh, 2020). It is necessary to consider the political and economic conditions of bourgeois Czechoslovakia, which had a direct influence on E. Konratovych. Alongside the global economic crisis that affected Czechoslovakia, this period was also characterised by the intensification of the revolutionary movement among workers and peasants. Living and working as a teacher in a rural environment,

Konratovych was closely acquainted with the hardships faced by the peasantry. These widespread social disturbances, often culminating in tragic outcomes, significantly influenced the ideological and creative divisions within the artistic intelligentsia (Gapak, 1983).



**Figure 3.** The Funeral of a Poor Man. 1940s.

Oil on canvas. 72×67

**Source:** Transcarpathian Regional Art Museum named after Y. Bokshai

It is worth noting the educational work of individual members of the Society. Z. Sholtes, who was a minister of religious cult in Uzhok village (1933-1937) significantly contributed to the involvement of rural youth in cultural life. The author established a creative workshop in this location, which became a centre for local engagement. Peasants, along with young boys to whom the author taught ornamentation techniques, were common attendees. While the girls produced traditional red embroidery based on author's designs, the boys practiced wood carving. On Sundays, the author delivered lectures on folk art, fostering a deeper appreciation of cultural heritage among the community (Autobiography of Z. Sholtes, n.d.).

In the 1930s, the graduates of "Public School of Drawing" began their exhibition activities. In 1931, A. Kotska began teaching career at a public school in the village of Verkhovyna. During this period, Kotska created a series of genre scenes and landscapes reflecting local life, some of which were later exhibited in Uzhhorod in 1933 and 1935 (Autobiography of A. Kotska, n.d.). A. Boretskyii exhibited personal works at the exhibition in 1933 together with the works of A. Kotska. Z. Sholtes organised the first personal exhibitions in 1932 and 1933 in Uzhgorod. Later, E. Konratovych began an exhibition career. In 1935, Konratovych was admitted as

a full member of the Union of Artists of Transcarpathia, actively participating in all exhibitions organised under its auspices (Personal sheet on personnel accounting of Konratovych Ernest, n.d.).

In the late 1930s, the political situation in Europe began to worsen. Aggression in Germany's actions grew; On March 15, 1939, the Hungarian troops occupied Subcarpathian Rus (Erdeli, 2012). On May 20, 1939, the first meeting of the "Society of Contributors to the Fine Arts" was held, it was reorganised into the Union of Subcarpathian Artists (Nebesnyk, 2007). From July to August this year, members of the Union together with representatives of the Art Institute in Budapest organised a plein air painting in the villages of Velykyi Bereznyi district – Volosyanka and Uzhok.

After summing up the results of the plein air painting, the artists of the Union participated in the 5<sup>th</sup> All-Hungarian Exhibition in Kosice. The local press regarded the event as positive, noting the work of the young A. Kotska (Erfan & Miasishcheva, 2011). The artist was soon invited to study at the Roman Academy of Fine Arts. In 1940, an exhibition of works by Transcarpathian artists was opened in the Uzhgorod coffee house. Hungarian critic E. Kallai (1940) identified common and distinctive features of Subcarpathian and Hungarian painting, as well as noted the movement of Subcarpathian artists to individualisation. During the occupation, the Hungarian authorities understood the need to find common ground with the intelligentsia. To this end, Hungarian authorities began to organise artistic events of artistic direction. "Art Weeks" were the most famous, the events of which were described in detail by A. Erdeli (1941). For four weeks, cultural and artistic events of various directions were held in Uzhgorod, which were designed to show "modern Hungarian values". An exhibition of contemporary Hungarian painting, graphics and sculpture was demonstrated as part of the event. The artist also presented a review of Subcarpathian artists who took part in the weeks.

The events of the war were reflected by E. Konratovych in 1939-1944. Albums with sketches were filled with images of crosses ("Tombstone with red birds", 1943), uprooted trees resembling the ruins of cities ("Old tree with a bunker", 1943); "Bunkers", 1942-1944). "Evacuation in Verkhovyna" (1944) (Fig. 4) is notable for the colour palette, built on the contrast between shades of red and green. The dense arrangement of women in the foreground, positioned close to the edge of the canvas, evokes a sense of silent despair and fear of an uncertain future (Chepesh, 2023). Specific for that time gloomy, dark blue-violet colors, contrasting with bright red-yellow ones intensify the feeling of anxiety and restlessness (Martylenko, 1973). During the occupation of Subcarpathian Ruthenia by Hungarian troops, the authorities tried to support the development of art, while other industries were falling into decay, including the economy and industry. Such a

policy led to future significant problems in the lives of Verkhovyna peasants and was reflected in the work of Transcarpathian artists.



**Figure 4.** Evacuation in Verkhovyna. 1944.  
Cardboard, oil. 50×70

**Source:** Zaporizhia Regional Art Museum

The cultural and artistic environment of Uzhhorod in the 1920s-1930s significantly affected the formation of Ernest Kontratyovych's artistic identity. During this period, the city experienced a true cultural renaissance, driven by the incorporation of Subcarpathian Rus into Czechoslovakia, which initiated modernisation processes in education, infrastructure, and culture. Thanks to the Czechoslovak government's policies, Uzhhorod saw the emergence of new educational institutions, cultural organisations, and an active intellectual community that fostered the development of artistic life. One of the key events of the time was the founding of the Public Drawing School in 1927 by A. Erdeli and Y. Bokshai. In this institution the young E. Kontratyovych received foundational artistic education, laying the groundwork for future creative development. Kontratyovych's interaction with leading artists of the time, particularly A. Erdeli and Y. Bokshai, inspired a deep interest in European art movements while nurturing a strong appreciation for local artistic traditions. Uzhhorod of the 1920s-1930s served as a cultural bridge between East and West, and this synthesis was reflected in its art scene. The combination of modernist influences with folk aesthetics became a defining feature of Kontratyovych's artistic style, which later manifested in landscapes and genre works. Thus, the vibrant cultural life of interwar Uzhhorod, the availability of formal art education, and contact with talented contemporaries played a decisive role in shaping E. Kontratyovych as an artist.

## CONCLUSIONS

The cultural and artistic developments that occurred in Subcarpathian Rus during the 1920s-1930s provided a significant impetus for the further evolution of the

Transcarpathian school of visual arts. The Czechoslovak government was central in this process, as broad reforms in major sectors contributed to the revival of the cultural heritage of the local population. A systematic and detailed examination of the socio-cultural life of Transcarpathia in the interwar period was conducted; the role of individual artists (A. Erdeli, Y. Bokshai, E. Kontratyovych, Z. Sholtes, etc.) and organisations (Mukachevo Art Club, the Society of Fine Arts of Subcarpathian Rus) in the formation of professional art education and traditions of fine arts were clarified. This identified the key factors that contributed to the formation of the regional art school and the development of the original artistic environment of Transcarpathia.

The study determined that the key factors influencing the development of Kontratyovych's work were, in particular, T. Masaryk's reforms that contributed to the development of infrastructure and support for education and culture. In addition, the foundation of the Public Drawing School in Uzhhorod in 1927 was an important stage in the formation of a professional artistic environment that influenced the work of Transcarpathian artists, and participation in exhibitions abroad and the creation of the Society of Fine Arts of Subcarpathian Rus provided Kontratyovych with international recognition. The study determined that the cultural and artistic environment of Uzhhorod in the 1920s and 1930s had a significant impact on the formation of Ernest Kontratyovych's artistic identity. Thanks to educational institutions, cultural organisations, and interaction with leading artists of the time, in particular A. Erdeli and Y. Bokshai, the artist managed to combine European modernist influences with local artistic traditions, which determined the style of the author. Social themes were vividly expressed in the works of E. Kontratyovych, which reflect compassion for human suffering and social injustice. The artist's works revealed that paintings depicted the harsh realities of peasant life – poverty, disability, and unemployment. The influence of the global economic crisis, as portrayed in paintings, demonstrated that despite the overall cultural revival, the Czechoslovak government failed to address key problems that perpetuated economic backwardness and led to tragic consequences for the region's population.

Further research on the artistic life of Transcarpathia during the interwar period may follow a variety of directions, including an in-depth analysis of the creative output of individual regional artists, especially lesser-known figures, with an emphasis on visual language, stylistic characteristics, and the socio-political context of their work. Expanding the source base through archival materials, private collections, and oral testimonies remains highly relevant, as it can help better reconstruct the cultural landscape of the era. Promising avenues include the study of the system of art education, institutional support for artists, connections with

educational centers of interwar Czechoslovakia, and comparative analysis of Transcarpathian art within the broader European artistic context. Modern technologies open new possibilities for the digitisation and popularisation of the region's artistic heritage, and when combined with interdisciplinary approaches – historical, sociological, psychological, and postcolonial – they will contribute to a deeper understanding of the role of art in the cultural landscape of Transcarpathia in the first half of the 20<sup>th</sup> century.

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## CONFLICT OF INTEREST

Authors declare that they have no conflict of interest.

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## Культурно-мистецьке середовище Закарпаття в міжвоєнний період та його вплив на Е. Контратовича

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**Анотація.** Актуальність дослідження зумовлена необхідністю осмислення впливу складних соціально-економічних обставин міжвоєнного періоду та культурного відродження Закарпаття на формування творчого світогляду Ернеста Контратовича. Метою статті було проаналізувати формування та розвиток культурно-мистецького центру в Закарпатті та охарактеризувати його вплив на Е. Контратовича. Методологія включала використання історичного, біографічного, аналітичного та ряду мистецтвознавчих методів, які допомогли всебічно охарактеризувати історичний контекст і розвиток культурної сфери на території Закарпаття в зазначений хронологічний період. Ці методи також використовувались для аналізу мистецького середовища Е. Контратовича та доведення його впливу на вибір тем і сюжетів на ранньому етапі творчості. У статті розглянуто розвиток культурного середовища в Закарпатті в міжвоєнний період, що безсумнівно вплинуло на формування художнього стилю Контратовича та вибір сюжетів і тем на ранньому етапі його творчості. Зібрано значну кількість фактичного матеріалу про художнє та культурне життя Підкарпатської Русі в 1920-1930-х роках. Доведено вплив середовища на формування вибору тем і сюжетів для творів Е. Контратовича. Висновки, зроблені в ході дослідження, сприяють доповненню цілісної картини розвитку культурно-мистецьких процесів в Закарпатті в ХХ столітті. Значна частина історіографічного та фактичного матеріалу може бути корисною для наукових досліджень, музейної роботи, написання підручників, програм та лекційних курсів

**Ключові слова:** Підкарпатська Русь, школа живопису; Товариство діячів образотворчого мистецтва на Підкарпатській Русі; міжвоєнний період; регіональна ідентичність



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## Evolution and innovation: Contemporary trends in graphic design

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**Abstract.** This article aimed to explore current trends in graphic design and to identify the skills and philosophies required for designers to remain relevant in an increasingly digital and user-centric world. A mixed-methods approach was employed, combining qualitative and quantitative analysis to examine prevailing trends in graphic design, with a particular focus on identifying patterns and innovations in design practices – especially in relation to digital tools, minimalist aesthetics, typography, and user experience. The study found that the integration of digital tools, such as AI powered design software and augmented reality, has transformed the creative process, enabling designers to produce more dynamic and interactive visual experiences. At the same time, the trend towards minimalism reflects a broader cultural shift towards simplicity and clarity, with designers prioritising clean layouts, limited colour palettes, and functional aesthetics. Typography has also evolved, becoming increasingly experimental through the use of custom fonts and dynamic typefaces that enhance brand personality and user engagement. An emerging trend has been the incorporation of sustainable practices into design, such as eco-friendly materials and energy-efficient digital solutions. The findings indicate that contemporary graphic design continues to adapt to a digital and user-focused environment. These results have significant practical implications for both designers and industries reliant on visual communication, providing a valuable resource for understanding and navigating the rapidly evolving graphic design landscape

**Keywords:** interaction; visual communication design; user engagement; interactive design; user experience (UX)

### INTRODUCTION

Graphic design is continually evolving, shaped significantly by rapid technological developments and shifting cultural paradigms. With digital innovation increasingly influencing creative methodologies, designers are now leveraging sophisticated tools such as AI-driven software and augmented reality (AR) to generate interactive and immersive experiences. Designers integrate these technologies not merely as supplementary elements, but as integral components of the creative process. Recent studies on the evolution of graphic design

have highlighted the transformative role of digital tools, yet gaps remain in addressing the full scope of technological advancements and their interdisciplinary impacts. For instance, A. Balakrishnan & M. Najana (2024) noted that while AI and AR have revolutionised creative processes, their potential for fostering real-time interactive user engagement – particularly in non-gaming contexts – remains underexplored in commercial design applications. Similarly, F. Song *et al.* (2024) demonstrated how AI integration in metaverse ecommerce

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extends beyond efficiency gains, enabling immersive brand experiences that redefine visual communication. However, foundational studies such as those by G.E.D. Elkheshen (2020) primarily focused on the initial phases of the digital revolution, overlooking the nuanced applications of AR and AI in contemporary design practices.

The minimalist aesthetic, as examined by M.C. Wibowo & A. Zainudin (2024), reflects a cultural shift towards simplicity, with empirical evidence showing its efficacy in reducing cognitive load for Generation Z audiences. Their findings align with S. Gumber's (2023) assertion that minimalism transcends visual trends, serving as a functional framework for enhancing usability. Nonetheless, prior research has often neglected the cultural motivations behind minimalist principles, particularly their role on digital platforms. Typography's evolution is another critical area where recent scholarship, such as S.T.F. Poon (2021), has underscored the strategic use of custom fonts to reinforce brand identity in digital media. Prior research in this domain, however, has largely overlooked the adaptive potential of experimental typography within multilingual and interactive digital environments. N. Qyll (2022), in their article, pointed out the lack of a new paradigm that accounts for the differences between screen and print typography and called for the development of a conceptual framework that reflects the impact of new media on typography practice.

User experience (UX) research has also advanced, with T.S. Da Silva *et al.* (2012) laying the groundwork for iterative design methodologies. Recent studies, such as A.G. Persada's (2018), have expanded this by integrating emotional design principles, showing how aesthetics and psychology converge to enhance engagement. Yet, a holistic framework linking UX to sustainability – as proposed by G.A. Bonsu *et al.* (2020) – is still nascent. Their study critiqued the lack of eco-conscious practices in developing nations, urging designers to adopt lifecycle approaches. While contemporary graphic design research has achieved noteworthy advancements, it still falls short of a unified framework that fully captures the interplay among technological progress, aesthetic innovation, and user-centred strategies. Although many studies discuss these elements individually, few address how they converge and reinforce one another in practical design contexts. This fragmented understanding limits designers' ability to seamlessly merge cutting-edge tools and culturally resonant visuals with user-driven principles, ultimately constraining the potential for transformative outcomes.

Consequently, there is a pronounced gap in the literature examining the wider implications of these trends for both practical applications and theoretical evolution within graphic design. Bridging this gap is crucial for charting more holistic directions in future practice and education, ensuring that the discipline

remains relevant, responsive, and robust in a continually shifting digital landscape. By analysing key developments such as the integration of digital tools, the rise of minimalism, the evolution of typography, and the growing emphasis on user experience, this study aimed to provide a comprehensive overview of the current state of graphic design.

## ■ MATERIALS AND METHODS

This study employed a mixed-methods research approach, combining qualitative case study analysis with quantitative data evaluation, to investigate contemporary trends in graphic design. The methodology was selected to provide both an in-depth understanding of design practices and measurable evidence of their effectiveness. The research was conducted in three sequential phases. Case selection phase: five industry-leading brands were selected for analysis based on their prominence in design innovation: Apple (n.d.) (website design), Netflix (typography system) (Doughnut, 2023), Nike (AR campaigns) (Williams, 2020), Headspace (app interface), and sleepmōd (Sleepmod, n.d.) (sustainable branding). Selection criteria included: a) market leadership, b) design award recognition, and c) documented user engagement metrics. Data collection phase: digital assets were gathered from official company websites and mobile applications; typography samples were extracted from Google Fonts (n.d.) and Variable Fonts (n.d.) platforms; AR campaign data were collected from Nike's official marketing materials; sustainable design specifications were obtained from sleepmōd's product documentation. Analysis phase: visual analysis evaluated colour schemes, layout structures, and typographic systems; user experience metrics assessed navigation efficiency and accessibility features; sustainability indicators measured material choices and energy efficiency claims.

The study adopted the design evaluation model proposed by B. Müller *et al.* (2013) for brand consistency assessment while incorporating the UX testing methodology from T.B. dos Santos *et al.* (2021). Key evaluation metrics included:

1. Digital integration: depth of AI/AR implementation; range of device compatibility.
2. Minimalist aesthetics: colour palette complexity; compositional balance, including the level of negative space used to enhance visual expressiveness and interface readability.
3. Typography innovation: investment in custom font development; capability for multilingual adaptation.
4. User experience: task completion rate; emotional engagement score.
5. Sustainability: percentage of recycled materials used; digital energy efficiency claims.

Data sources, including primary materials, consisted of screenshots from the analysed digital platforms, variable font files from Google Fonts, AR campaign

demo videos from Nike, and technical specifications for sleepmōd's textile materials. Secondary data were collected from Google Scholar and IEEE Xplore.

The methodology incorporated modified versions of Y.K. Lee's (2022) AI implementation framework and G.A. Bonsu *et al.*'s (2020) sustainability assessment tool, with adaptations noted in Table 1. All website data were captured using Wayback Machine archives to ensure temporal consistency. This systematic approach enabled a comprehensive evaluation of each design element while maintaining replicability. Researchers documented all procedures in a shared digital logbook with timestamps and version control to ensure methodological transparency.

## RESULTS AND DISCUSSION

The in-depth investigation into interactivity within visual communication design reveals a wide array of influences and factors, ranging from the enhancement of user engagement and learning outcomes to addressing potential issues related to cognitive load and accessibility. This section presents the findings in detail and considers their broader implications, offering a nuanced perspective on the extent to which interactivity is shaping and redefining the visual communication design landscape.

### Design in transition: Integrating AI, AR, and minimalist aesthetics in contemporary practice

The adoption of AI and AR in graphic design has transformed creative workflows, enabling dynamic and interactive visual experiences. For example, AI-powered tools such as Adobe Sensei automate repetitive tasks, allowing designers to concentrate on innovation. This aligns with the findings of Y.K. Lee (2022), who demonstrated that AI integration enhances efficiency in design processes. However, while Lee's study emphasised productivity gains, the present research further identified AR's role in bridging digital and physical experiences – a factor less explored in prior studies. Nike's AR-based advertising campaigns (Fig. 1) exemplify how immersive technologies enhance user engagement, a trend corroborated by X. Fan *et al.* (2025), who found that AR increases customer purchasing intention compared to traditional media.

Minimalist design principles, characterised by clean layouts and restricted colour palettes, dominate contemporary aesthetics. Apple's website (Fig. 2) demonstrates how minimalism reduces cognitive load – a finding supported by S.M. Sani & Y.K. Shokoo (2016), who linked minimalist interfaces to improved user comprehension. In contrast, B. Müller *et al.* (2013) argued that oversimplification led to an 11% decrease in brand recognition. The results of this study counter this by demonstrating how brands such as Google balance simplicity with strategic typography and imagery, reinforcing identity without clutter. This divergence underscores the need for context-specific design frameworks.

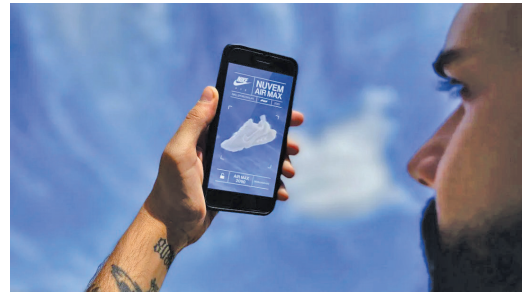


Figure 1. An AR-based advertising campaign by Nike  
Source: R. Williams (2020)

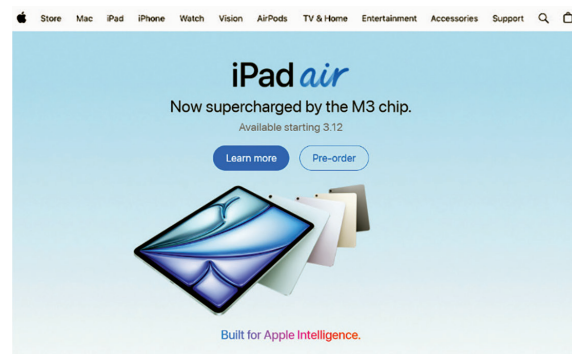


Figure 2. Apple's website highlighting minimalist design elements  
Source: Apple (n.d.)

Likewise, Google's Material Design framework emphasises simplicity, consistency, and responsiveness, ensuring a unified user experience across diverse platforms and devices. By removing superfluous elements, these minimalist approaches promote a clear, seamless interface that maintains brand consistency while fostering deeper user engagement.

### Evolution of typography: Custom fonts and dynamic typefaces

The use of custom typography not only reinforces brand identity but also increases adaptability across different platforms. According to V. Singla & N. Sharma (2022), fonts constitute a core component of a brand's visual identity system, serving to strengthen its uniqueness and recognition. Different font styles effectively convey brand values and cultural positioning, thereby fostering deeper connections with target audiences. This perspective is further extended by recent advancements in dynamic typography – particularly its capacity to respond to user interactions – which significantly enhances engagement, a dimension that earlier typographic studies often underestimated (Poon, 2021; Thottingal, 2025).

These innovations transcend mere aesthetic considerations, emerging as powerful strategic tools for brand differentiation in increasingly competitive markets. Through the development of proprietary typefaces – exemplified by industry leaders such as Netflix and

Spotify – designers are able to encapsulate a brand’s unique voice, values, and visual identity within each letterform. A paradigmatic case is Netflix’s custom typeface, Netflix Sans, which was meticulously engineered to reflect the brand’s dynamic character while ensuring optimal readability across diverse screens and devices (Fig. 3). This typographic solution not only consolidates Netflix’s distinctive branding but also enhances user experience through optimised on-screen text presentation. The strategic implementation of such custom typography demonstrates how technical innovation can intersect with brand strategy to create compelling visual communication systems.



**Figure 3.** Dynamic typography in action  
Source: Doughnut (2023)

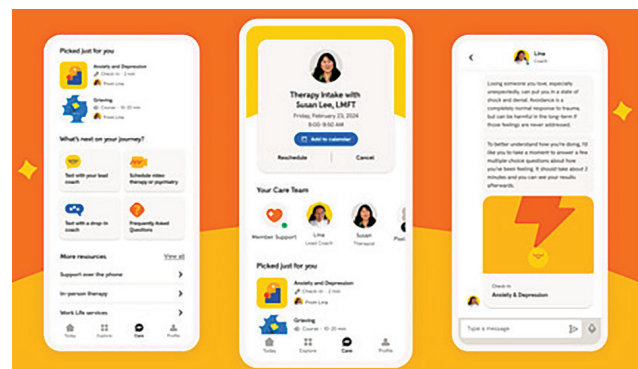
Beyond their direct effect on brand cohesion, custom typefaces can also address multilingual requirements, allowing designers to tailor the appearance and functionality of text to align with cultural norms and linguistic nuances. This flexibility is especially valuable for global companies that must accommodate audiences who speak different languages or use scripts with unique typographic properties. Consequently, custom fonts are increasingly regarded as an essential asset in establishing a genuinely universal brand presence.

However, dynamic typography presents technical challenges. As noted by S. Thottingal (2025), although variable and colour fonts provide designers with greater creative flexibility, they also introduce complications, such as browser compatibility, performance limitations, and the challenge of maintaining consistency across platforms and devices. The findings of this study echo this but further emphasise the importance of collaboration between designers and developers in addressing these obstacles. Dynamic typography, which adapts in real time to evolving user interactions and contextual variables, is likewise on the rise. Its influence is most apparent in digital environments, where letters and words may shift, animate, or change style in response to a user’s behaviour, ambient lighting, or device specifications. For example, platforms such as Google Fonts (n.d.) and Variable Fonts (n.d.) employ variable fonts capable of automatically adjusting attributes such as weight, spacing, or contrast to enhance

legibility under varying resolutions or screen orientations. Through these real-time adaptations, dynamic typography transcends its traditional role of presenting static information and instead becomes a core component of the user experience. Furthermore, the integration of motion graphics and micro-animations in dynamic typography can capture attention more effectively, guiding users’ focus and subtly highlighting key content or calls to action. Ultimately, this transformative approach not only enhances usability but also offers designers and brands a powerful means of crafting immersive, memorable experiences that resonate within an ever-evolving digital landscape.

### Emphasis on user experience (UX): Iterative and collaborative design

The shift towards UX-centric design is evident in apps such as Headspace (Fig. 4), where iterative testing refines usability. This mirrors the conclusions of T.B. dos Santos *et al.* (2021), who found that prototyping helps companies integrate user feedback into development, thereby improving user experience and market success. However, their study overlooked emotional design, which this research identifies as a critical component of long-term engagement. The growing emphasis on user experience (UX) has propelled graphic design beyond superficial aesthetics into a domain where usability, accessibility, and adaptability take precedence. Designers increasingly recognise that a visually striking interface alone does not guarantee user satisfaction. Instead, true fulfilment arises from ensuring that each design decision resonates with actual user preferences and aligns with contextual needs. As a result, user-centred design methodologies – including usability testing, prototyping, and ongoing feedback loops – have become fundamental components of the modern design toolkit.



**Figure 4.** Headspace app interface  
Source: Mexico Bariatric Center (2024)

An illustrative example is the widely adopted meditation app Headspace, where designers invested considerable resources in iterative testing to refine aspects such as navigation flow, visual hierarchy, and interactive elements (Fig. 4). By soliciting and incorporating input from real users at multiple stages of the development

process, the design team effectively merged simplicity with rich functionality. Similarly, companies such as Airbnb exemplify the value of collaborative design by assembling multidisciplinary teams – comprising designers, product managers, developers, and researchers – to address UX challenges. This cross-functional approach ensures that design decisions reflect diverse perspectives, align with broader organisational goals, and remain attuned to user aspirations. The outcome is a product that balances aesthetic appeal with practical utility, keeping pace with consumers' evolving expectations in a fast-paced digital environment. K.K. Feng *et al.* (2023) likewise highlighted that interdisciplinary teams can integrate knowledge and skills from varied professional domains, thereby enhancing the quality of user experience design. Similarly, Figma's real-time collaboration system exemplifies how cloud-based design tools enable seamless teamwork across disciplines. By allowing designers, developers, and stakeholders to co-edit projects synchronously, Figma shortens feedback cycles and accelerates iterative refinement. Its version control and commenting features further streamline the incorporation of user insights, aligning with the UX-focused principles evident in Headspace's development. This approach not only increases efficiency but also democratises the design process, ensuring inclusivity in decision-making – a crucial factor for projects involving distributed teams or operating under tight deadlines.

### **Sustainability in graphic design:**

#### **Eco-friendly practices**

Sustainable design practices – ranging from the use of recycled materials to energy-efficient digital solutions – are gaining momentum. Studies by I. Hameed & I. Waris (2018) confirmed that eco-conscious branding enhances consumer trust. However, this research adds that sustainability initiatives must also be economically viable to ensure broader industry adoption. Heightened awareness of environmental concerns has led many graphic designers to adopt eco-responsible strategies across all stages of their work, reflecting a systemic shift towards more sustainable modes of production and consumption. This shift extends beyond the use of environmentally friendly materials in print projects – such as recycled paper, vegetable- or soy-based inks, and low-impact printing processes – to encompass a comprehensive lifecycle approach. Designers increasingly strive to reduce waste and resource consumption from concept development through to distribution, integrating sustainable principles directly into creative briefs and client proposals. By doing so, they aim not only to minimise ecological harm but also to set a precedent for forward-thinking, conscientious design.

For instance, the design agency ecoBrand specialises in crafting sustainable branding solutions, combining recycled or biodegradable materials with efficient, low-ink printing technologies and ecofriendly

packaging. One example is their project “sleepmōd”, an eco-friendly bedding brand that utilises certified eco-fibres from Lenzing AG and Unifi, Inc., such as TENCEL™ and REPREVE®. These materials effectively reduce water usage, fertiliser and pesticide application, and microplastic pollution associated with traditional textile production (Sleepmod, n.d.). The brand's products are dye-free and pollution-free, and recycling plastic bottles into premium textile fibres, significantly reduces its environmental impact. These initiatives lower the overall ecological footprint while underscoring a commitment to social responsibility. Beyond print-based efforts, web and application design also present opportunities for sustainability. Some creatives advocate for “dark mode” interfaces or other low-energy UI solutions to conserve power – particularly on devices with OLED or AMOLED screens, as quantified by S. Andrew *et al.* (2024). Others optimise websites to reduce data transfer demands and reliance on resource-intensive hosting services. Furthermore, certain agencies have begun exploring carbon offset programmes and green hosting providers to further diminish their digital impact. Such practices not only align with international sustainability objectives but also resonate strongly with a growing audience of consumers who actively seek out environmentally responsible brands. In an increasingly competitive market, adopting these ecofriendly strategies offers both a moral advantage and a tangible business benefit, enabling companies to stand out while demonstrating a genuine commitment to preserving the planet. Another notable example is IKEA's modular packaging system, which exemplifies sustainable design through material efficiency and functional adaptability (IKEA, n.d.). By standardising box sizes and optimising spatial use, IKEA reduces material waste during production and transportation while maintaining structural integrity. The packaging also incorporates recycled cardboard and minimalist graphic elements, aligning with the brand's eco-conscious ethos. This approach not only reduces environmental impact but also enhances the user experience – customers can easily identify and assemble products due to the intuitive visual labelling system. Such innovations demonstrate how sustainability can be embedded within both physical design and logistical workflows, offering a scalable model for other industries.

#### **Synthesis and implications: Interconnected trends shaping modern graphic design**

The findings of this study demonstrate that contemporary graphic design is shaped by a dynamic interplay of technological innovation, aesthetic evolution, and user-centred methodologies. As the study has shown, the integration of AI and AR tools – such as those employed by Nike and Adobe Sensei – has redefined creative workflows by enabling interactive and immersive experiences. According to the conclusions of the study by X. Fan *et al.* (2025), AR significantly enhances user

engagement, yet accessibility barriers remain a critical limitation, particularly in markets with technological disparities. This technological shift is further complemented by minimalist design principles, which reduce cognitive load and improve usability, as evidenced by Apple's streamlined interfaces and supported by empirical data from S.M. Sani & Y.K. Shokooh (2016). However, B. Müller *et al.* (2013) cautioned against excessive simplification, highlighting the need for balanced design strategies that maintain brand recognition while optimising functionality.

Typography has also undergone a transformative evolution, with custom and dynamic typefaces serving as key tools for brand differentiation and multilingual adaptability. According to data from V. Singla & N. Sharma (2022), proprietary fonts such as Netflix Sans reinforce brand identity, while dynamic typography, as analysed by S. Thottingal (2025), introduces technical challenges that necessitate closer collaboration between designers and developers. These typographic advancements align with broader UX-centric trends, where iterative design processes – exemplified by Headspace's development cycle – prioritise usability and emotional resonance. T.B. dos Santos *et al.* (2021) emphasised that prototyping and user feedback are critical for refining digital products, yet their research overlooks the economic and logistical constraints faced by smaller design studios – an aspect examined in greater depth by R. Frankiv & D. Ditzkovskiy (2023) across the context of the impact of business models on UX/UI solutions across various service sectors.

Sustainability emerges as another pivotal trend, with eco-friendly practices gaining traction in both print and digital design. According to the study by I. Hameed & I. Waris (2018), sustainable branding enhances consumer trust, but widespread adoption depends on economic viability. The research further reveals that minimalist design principles inherently support sustainability by reducing resource-intensive elements, while AI-driven tools optimise energy-efficient digital solutions. These interconnected trends underscore a broader shift towards holistic design frameworks that harmonise technological capabilities, aesthetic clarity, and ethical considerations.

The study addresses its core research questions by identifying four dominant trends in modern graphic design: (1) the integration of AI and AR for interactive experiences; (2) the dominance of minimalist aesthetics for improved usability; (3) the strategic use of dynamic typography for brand engagement; and (4) the prioritisation of UX and sustainability. To navigate these trends, designers must cultivate a diverse skill set, including proficiency in digital tools, an understanding of cognitive psychology, cross-disciplinary collaboration abilities, and a commitment to sustainable practices. These competencies enable designers to create solutions that are not only

visually compelling but also functionally robust and ethically grounded. Limitations of this study include its focus on tech-forward markets, which may not fully represent global design practices. Future research, as suggested by F.M. Van Amstel (2023), should explore these trends in underrepresented regions to decolonise design discourse and ensure inclusivity. Additionally, longitudinal studies are needed to assess the long-term impact of converging trends on industry standards and educational curricula. These directions will be critical for fostering a more equitable and adaptive design landscape.

## CONCLUSIONS

According to the analysis conducted, it was found that technological advancements, cultural shifts, and evolving user expectations have a transformative impact on modern graphic design. The integration of digital tools – particularly artificial intelligence (AI) and augmented reality (AR) – has expanded the possibilities for creating dynamic and interactive visual content, thereby enhancing the depth of user engagement. It was also found that the spread of minimalist aesthetics aligns with a broader cultural trend that favours simplicity and functionality. In highly visually saturated environments, minimalism enables clear and effective communication of essential messages. The evolution of typography has demonstrated the growing importance of custom fonts and dynamic typefaces as tools for reinforcing brand identity and capturing user attention across various media platforms.

Particular attention was given to the rising importance of user experience (UX), which has led to the development of more iterative and collaborative workflows. In these processes, designers, developers, and researchers jointly prioritise usability, accessibility, emotional engagement, and visual quality. Furthermore, the active incorporation of sustainable practices into graphic design reflects a growing sense of environmental responsibility among brands. Eco-oriented methods not only meet consumers' ethical expectations but also provide a tangible competitive advantage.

Thus, the findings of the study outline key directions in the transformation of the graphic design field that are relevant for designers, businesses, and educational institutions. Future research should focus on the intersection of technology, aesthetics, and sustainable design, as well as evaluate the long-term consequences of these converging trends for creative practices and market demands.

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## Еволюція та інновації: сучасні тенденції в графічному дизайні

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**Анотація.** Метою цієї статті було дослідити сучасні тенденції в графічному дизайні та визначити навички і філософію, необхідні дизайнерам, щоб залишатися актуальними у світі, який стає дедалі більш цифровим і орієнтованим на користувача. У цьому дослідженні використано змішаний підхід, що поєднує якісний і кількісний аналіз для вивчення сучасних тенденцій у графічному дизайні, зосереджуючись на виявленні закономірностей та інновацій у практиці дизайну, зокрема щодо цифрових інструментів, мінімалістичної естетики, типографіки та користувацького досвіду. Дослідження показало, що інтеграція цифрових інструментів, таких як програмне забезпечення для дизайну на основі штучного інтелекту та доповненої реальності, революціонізувала творчий процес, дозволивши дизайнерам створювати більш динамічні та інтерактивні візуальні образи. Водночас тенденція до мінімалізму відображає ширший культурний зсув у бік простоти і ясності, коли дизайнери надають перевагу чистим макетам, обмеженим кольоровим палітрам і функціональній естетиці. Було виявлено, що типографіка також еволюціонує, стаючи більш експериментальною завдяки використанню нестандартних шрифтів і динамічних гарнітур, які посилювали індивідуальність бренду та залучення користувачів. Також було виявлено нову тенденцію, яка полягає у впровадженні сталих практик у дизайн, таких як екологічно чисті матеріали та енергоефективні цифрові рішення. Результати дослідження показали, що сучасний графічний дизайн адаптується до дедалі більш цифрового та орієнтованого на користувача світу. Результати цього дослідження мають важливе практичне значення як для дизайнерів, так і для індустрій, що покладаються на візуальну комунікацію, слугуючи цінним ресурсом для розуміння та навігації у швидкозмінному ландшафті графічного дизайну.

**Ключові слова:** взаємодія; дизайн візуальної комунікації; залучення користувачів; інтерактивний дизайн; користувацький досвід (UX)



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## Post-industrial heterotopias: Art clusters as fluctuating spaces between marginality and aestheticisation

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**Abstract.** The research relevance is determined by the need to determine the spatial transformations of post-industrial territories in the context of cultural dynamics and aestheticisation of marginal artistic practices. The study aimed to analyse art clusters as fluctuating post-industrial spaces that exist between marginality and aestheticisation, to reveal the mechanisms and stages of their transformation from countercultural initiatives to cultural and commercial objects. The methodological basis of the study included an interdisciplinary approach that combines philosophical, cultural and urban methods of analysis, as well as the case study method and visual and semiotic analysis. The study combined the concepts of Foucault, Lefebvre, and Baudrillard to analyse the cultural transformation of art clusters as post-industrial spaces, which not only described changes in the urban environment but also critically reflected on the processes of legitimising marginal cultural content. The author's typology of art clusters was presented based on the peculiarities of the formation. The analysis has revealed that art clusters of the 1<sup>st</sup> type “underground transformations” (according to the author's typology of art clusters) function as dynamic spatial constructs in which marginal initiatives are transformed into legitimate cultural practices. Spatial interventions, in particular street art, serve as semiotic markers that form a new identity of a place and contribute to its aesthetic redefinition. At the same time, the study established that the processes of commodification and symbolic appropriation lead to the loss of authenticity of protest practices, transforming them into simulacra. The practical value of the study is determined by the possibility of using the results for critical analysis of urban development policies, cultural planning and reconceptualisation of public space in the context of post-industrial transformation

**Keywords:** artistic environment; gentrification; street art; semiotics of space; commodification of culture; simulacrum

### INTRODUCTION

In the second half of the twentieth and early twenty-first centuries, cities saw a growing number of creative formations emerging on the territories of decaying industrial sites. Art clusters have emerged as urban phenomena that combine marginal cultural initiatives, street art, and tools for aestheticising post-industrial space. As O. Ivashko (2021) noted, the emergence is driven by the activities of informal movements (including squatting) and is at the same time accompanied by gradual legitimisation within urban development strategies, which indicates a complex dynamic between counterculture and official cultural policy.

Contemporary studies, such as the study by T. Tunali (2021) on the policy of cultural regeneration in urban spaces, have focused on the contradictory nature of art clusters. On the one hand, they function as spaces of free creativity, where new forms of cultural communication are unfolding. On the other hand, their integration into the city's cultural economy leads to gentrification processes that displace authentic initiatives and turn the space into an aestheticised commercial product. The need for rethinking such spaces as unstable, fluctuating environments was substantiated by M.N. Marino *et al.* (2023). The concept of heteroto-

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pias by M. Foucault (1986) provided a methodological framework for considering art clusters as “other spaces” that have the potential to transform social and cultural meanings through spatial organisation. It is also worth highlighting the modern adaptations of this concept, in particular the analysis of spatial hybrid practices in post-industrial cities by U. Gultmair (2021).

In the context of rethinking the role of street art, the study by P. Bengtsen (2019), where street art acts as a marker of the identity of a place, contributing to the formation of an “urban narrative” that affects both the perception of the environment and social practices in it, is noteworthy. The study by M. Kalashnyk (2024) showed that street art has become a powerful means of visual expression of social and political issues, influencing public opinion and stimulating social change. In addition, the researcher noted that the integration of street art into the gallery space can help preserve its cultural value and enhance its social impact. In turn, A. Zbarazhska (2020) studied the artistic life of the squats of the 1990s, which is also important for understanding the origins of modern art clusters.

The problem of commodification of cultural protest was analysed by T. Tunali (2021), emphasising the risks of turning authentic marginal practices into elements of commercial attractiveness for urban tourism strategies. The issues of social justice and cultural gentrification also remain relevant. The critical analysis of the visual environment of the post-industrial city presented in the studies by A. Baldini (2020) on the analysis of the décor and marginal landscapes as spaces of aesthetic conflict and symbolic violence are notable. Thus, the space of art clusters functions as a polyphonic field of struggle between marginality and commercialisation. Similar observations were also made in the study by C. Yang & Q. Zhu (2023), who analysed the social conflict associated with cultural gentrification in China.

In this context, it is worth mentioning the study by S. Zukin (2020) on the analysis of the “culture of cities” as a process of symbolic and economic control over space. The study emphasised that cultural industries, in particular art clusters, are becoming a tool of soft power, which forms the image of the city as a creative centre, while deepening social hierarchies. The creation of an attractive urban façade is accompanied by the displacement of less privileged communities, which indicates the ambiguous role of creative spaces in urban development processes. As noted by S. Zukin (2020), in this case, culture in the city turns into a commodity that serves the interests of capital, while marginalising local practices. M.K. Demessie (2024) confirmed the important role of art objects in shaping the architectural environment of a modern city, in the context of the interaction between public space and residents. The study emphasised that combining art objects into conceptual groups creates a recognisable image of the

city, reflecting its cultural identity and promoting the development of public space as a space for communication and interaction.

The study aimed to examine art clusters as dynamic spaces on the verge of marginality and aestheticisation, as well as to explore the processes and stages of their evolution from countercultural practices to cultural and commercial phenomena. The objectives of the study were to identify the theoretical foundations of the conceptualisation of art clusters in the context of philosophical and cultural approaches; to identify signs of commodification and simulacra in the space of art clusters; to explore the role of artistic interventions (including street art) in shaping spatial identity; to analyse the impact of gentrification on the transformation of marginalised environments.

## **MATERIALS AND METHODS**

During the study, the case studies of art clusters located in the post-industrial districts of Kyiv, Kharkiv, Warsaw, Lodz, and Berlin were selected using the case study method. The key criterion for selecting the cases was the presence of spatial transformation of former industrial sites into cultural centres that demonstrate signs of both marginal and institutionalised cultural space. The analysis of these cases was used to trace general patterns and differences in the functioning of art clusters in different socio-cultural contexts.

A set of qualitative research methods was used to collect and analyse the material. An in-depth visual and semiotic analysis of the spatial elements of art clusters was conducted, with a special focus on street art, architectural solutions, graffiti and temporary installations. This identified the mechanisms of forming the symbolic identity of a place and the spatial redefinition of the post-industrial environment. The research also involved the analysis of documents from open sources: official websites of art clusters, social media pages, policy documents, curatorial manifestos, as well as publications in local media and academic journals. This approach traced the narrative construction of clusters as part of urban cultural policy.

Theoretical sources on urban transformations in post-industrial contexts were studied. The research strategy involved a chronological and comparative analysis, which was used to reconstruct the dynamics of the transformation of a marginal environment into a legitimate cultural space. The findings were interpreted within the framework of critical urban studies, emphasising the mechanisms of cultural appropriation, commodification of protest practices, and aestheticisation of marginal space. This approach presented art clusters as fluctuating spaces that manifest an ambivalent interaction between alternative culture, institutional recognition, and the socio-economic pressure of gentrification.

The methodological basis of the study was an interdisciplinary approach that integrates philosophical,

cultural and urban analysis methods. In particular, the research was based on the philosophical concepts of heterotopia by M. Foucault (1986), production of space by H. Lefebvre (1991) and simulacra by J. Baudrillard (1994), which were interpreted in the context of spatial transformations of post-industrial territories. This revealed the contradictory nature of art clusters as fluctuating spaces that balance between marginality and aestheticisation.

## RESULTS AND DISCUSSION

### Dynamics of transformation of art clusters as fluctuating post-industrial spaces

Art clusters that emerge in post-industrial areas are not only spaces for artists' self-expression, but also complex cultural and economic entities that interact with social, economic and architectural processes (Orlenko & Ivashko, 2017). An art cluster is a post-industrial space adapted for cultural and creative activities, often based on abandoned industrial facilities, which combines art studios, galleries and other functional areas for the development of creative industries. The specificity is determined by the ability to operate on the borderline between legality and illegality, cultural autonomy and institutionalisation, protest and commercialisation. They are defined as creative spaces that emerge in converted industrial buildings or underutilised areas, often under the influence of artists looking for affordable places to create. Artists often squat in abandoned industrial buildings, creating the phenomenon of industrial squatting, an informal use of space without official permission (Fig. 1).



**Figure 1.** Artists in the Kyiv squat "Parkomuna"  
**Source:** A. Zbarazhska (2020)

They usually occupy studio space, and over time, these spaces transform into structured cultural centres that influence urban renewal. In this process, successive stages of development can be identified, but not all art clusters go through them. Therefore, the study identified two main types of art clusters according to the way they are socially and culturally formed. The first type of art cluster is underground transformations that

emerge through industrial squatting. The formation begins with the unauthorised occupation of abandoned industrial spaces by artists and creative communities, who gradually turn these territories into informal cultural centres. Over time, such clusters can become institutionalised and partially commodified. Examples include the Artzavod Platform and Ostkreuz in Berlin. The second type is managed creative zones, which are formed with the support of city authorities or cultural institutions. Their creation is part of urban reconstruction and cultural development strategies, and the art clusters themselves have institutional support and clearly defined functionality from the outset. Examples of such clusters include the Dovzhenko Centre in Kyiv and the Shoreditch area in London.

The study addressed the art clusters of underground transformations, for which specific stages of their socio-cultural development have been identified. Thus, an art cluster is located only on the post-industrial territory and goes through certain stages of socio-cultural development that affect further scenarios of its transformation. The first stage of art cluster development is abandonment when former industrial facilities (factories, warehouses, etc.) are no longer used for their intended purpose and are in poor condition due to prolonged decay. This is followed by the stage of industrial squatting, when artists illegally occupy these spaces, setting up studios and organising cultural events. Thus, the formation of art clusters usually begins with illegal artistic interventions by artists looking for accessible spaces for creativity, taking over abandoned industrial facilities and turning them into centres of artistic experimentation and alternative culture (Hnatiuk, 2020). Such space becomes marginalised, but continues to develop, passing through the next stage of spontaneous cultural colonisation, when art space attracts the attention of creative communities and becomes a place for informal initiatives, which contributes to the organisation of the first cultural events. Although this space remains marginal, it begins to interact with a wider audience. The next stage is the aestheticisation of the space, where the art cluster is transformed into a well-organised cultural environment with improved infrastructure and artistic design. This process contributes to the renewal of abandoned areas and objects, which attracts wealthier residents and businesses but can lead to the displacement of the original residents. Gentrification is the next, and most fundamental stage, which transforms a space into a desirable area through artistic and architectural changes. It is key in transforming art clusters from marginal countercultural spaces to legalised cultural centres. At this stage, according to L. Hae (2011), art clusters can "balance between alternative practices and the onslaught of capitalist commodification". For instance, the Florentin district in Tel Aviv (Fig. 2), which became a centre of alternative culture thanks to artists and

squatters, gradually went through a process of gentrification and transformed into a commercialised space with cafes, galleries and boutiques aimed at a wealthier audience.



**Figure 2.** A fragment of the exterior of a building located in the Florentine district of Tel Aviv

**Source:** M. Weiss (2022)

Gentrification also changes the architectural appearance of space. Spatial interventions by architects create the effect of an “aestheticised ruin” of industrial heritage that retains its historical authenticity but at the same time becomes commercially attractive. According to A. Baldini (2020), this aestheticisation of ruin can turn a protest space into a commercial object. This is present in Berlin, where the Kreuzberg district, known for its alternative culture, has gradually turned into a space of galleries, cafes, and designer shops, displacing the artists who formed its original identity. The architectural elements of the history – brick facades, industrial windows, metal structures – serve as markers of memory, but at the same time acquire new meanings in the context of contemporary urban design. Ricardo Bofill’s La Fabrica (Fig. 3) in Barcelona is an example of the changes in historical space at the stage of gentrification. The project combines industrial heritage with new functions, which shows how industrial architecture can be transformed into a multifunctional art space that combines cultural heritage and the latest trends in contemporary art and architecture.



**Figure 3.** A fragment of the exterior of the current state-of-the-art cluster “La Fabrica” by Ricardo Bofill in Barcelona

**Source:** La Fabrica (n.d.)

The gentrification stage is followed by the cultural capitalisation of the art cluster, a process in which art spaces and events begin to acquire economic value, becoming part of economic activity. For example, in the case of the Station Nord art cluster in Copenhagen, the first art events in abandoned industrial areas were illegal, but gradually cultural institutions and businesses became interested in these spaces, which led to their legalisation and gentrification. Marginality, which initially appeared as a sign of radicalism and alternative, is becoming a marketable commodity. Thus, artistic initiatives in post-industrial areas often become catalysts for urban change, despite their initial marginality (Hae, 2011). For instance, former squats turned into galleries or cultural centres are integrated into the tourism sector, and their graffiti-covered walls become part of sightseeing routes. In this sense, gentrified art clusters become a kind of “museum heterotopia” where the authentic spirit of marginality functions as a symbolic resource for tourists but loses its original meaning as a protest gesture.

All of this leads to a change in the socio-cultural scenario: artists and alternative cultural groups that contributed to the creation of the art cluster may be displaced by rising rents and commercialisation. According to the study by L. Lees & C. Melhuish (2013), art clusters often face the risk of institutionalisation and loss of authenticity, which can be observed at this stage of development. As a result, the art cluster goes through the stage of social marginalisation of its original inhabitants, but retains its symbolic importance, moving to the stage of stable functioning. For example, in the case of the aforementioned Florentin district in Tel Aviv, the process of gentrification has led to artists being forced to leave the area due to rising rent prices, which characterises the phenomenon of social marginalisation of the original residents.

Thus, art clusters are constantly in a state of transformation and adaptation to changes in the cultural and social environment. Sometimes they can remain at the

stage of industrial squatting and act as countercultural spaces of underground art. In most cases, art clusters reach the stage of gentrification but do not develop further to the stage of cultural capitalisation, playing the role of “threshold” places between underground and mainstream culture. Sometimes art clusters develop rapidly, passing through all stages of development up to the stage of social marginalisation of the original inhabitants, where a period of stability begins, which does not last very long. Economic problems and “decline” can occur, which brings the art cluster back to decline, and then the area becomes attractive to squatters again. For example, the Metelkova art cluster (Fig. 4) emerged in the early 1990s as a squat on the territory of former military barracks. Artists and activists occupied the abandoned buildings, turning them into a centre of alternative culture. Over time, the space became popular with tourists and underwent gentrification. However, despite its institutionalisation, Metelkova retained its countercultural identity. At the same time, another squat in Ljubljana, Rog, was closed by the authorities, which shows the different fates of similar initiatives in the context of urban transformation.



**Figure 4.** A fragment of the exteriors of the Metelkova art cluster in Ljubljana

**Source:** Metelkova (n.d.)

Such dynamism, rhythmicity, as well as variability and dialecticity of art clusters, were used to address art clusters as fluctuating spaces, i.e. those that are constantly changing, being in a state of transformation, adaptation and fluctuation. They are not static but are characterised by dynamism, in which their content, functions, use and social roles can change depending on many factors. The fluctuation of art clusters is a concept that describes the unstable, changing and transient nature in the context of urban and socio-cultural transformations. From the initial stage of marginalisation (industrial squatting, in this case) as a place for alternative and countercultural initiatives to the stage of legalisation and commercialisation (gentrification and cultural capitalisation), art clusters are constantly changing, which preserves the relevance and attractiveness for different social groups.

In this context, the marginality of art clusters is manifested through interaction with illegal artistic interventions such as squatting movements, namely industrial squatting, the occupation and use of abandoned or disused industrial buildings and areas that have no official owner or remain empty, to create alternative cultural, social or artistic spaces, often in protesting commercialisation or urban change. An example of an art cluster as a fluid space is Villa Road in London, which became a place of alternative culture in the 1970s and was initially inhabited by artists, musicians and other creatives illegally. The marginality and protest nature of art clusters are also expressed through street art and graffiti, which has become an important expression of this marginality, as it articulates protest sentiments, political messages, and alternative narratives. Graffiti and street art not only emphasise the alternative nature of such spaces but also serve as a means of communication addressed to both the internal audience of the cluster and the external society. For example, in London’s Shoreditch district, graffiti has transformed the space from a neglected industrial area into a popular art tourism destination, where commercialisation has gradually replaced the spirit of protest. In this context, examples of the integration of marginal art into the art cluster space should be highlighted. Informal exhibitions in non-traditional spaces, such as abandoned warehouses or temporarily vacant buildings within an art cluster, can be used to organise informal exhibitions of marginal artists, providing an opportunity to see art that rarely comes to the attention of the public. In addition, owners of studios or workshops in the art cluster can use elements of marginal art in the design of their workspaces, paint walls, use found objects as decorative elements and display the works of original artists. Another example of integrating marginal art is the creation of art objects from recycled materials and the creation of ‘art courtyards’ with elements of naive art, which add a sense of informality to the space.

However, along with being marginalised, art clusters also attract official cultural institutions such as galleries, museums, and educational institutions. This leads to an internal conflict between the autonomy of artists and institutionalisation, where independence and alternatives can be partially lost through integration into formal cultural structures (Orlenko & Ivashko, 2017). An example of this is the Christiania art cluster in Copenhagen (Fig. 5), which initially existed as an illegal space for self-expression but later turned into a tourist attraction, causing conflicts between artists and the local administration (Shkoliar, 2021). This balance between marginality and integration into the official cultural space is crucial for determining the phenomenon of art clusters as specific post-industrial heterotopias.



**Figure 5.** A fragment of the building on the territory of the Christiania art cluster in Copenhagen

Source: M. Hesp (n.d.)

In general, the processes of abandonment, industrial squatting, cultural colonisation, aestheticisation, gentrification, cultural capitalisation and social marginalisation of industrial squatters reflect the complex dynamics of the transformation of art cluster spaces. They demonstrate how marginal countercultural spaces gradually lose their original radicality, becoming objects of cultural capitalisation and commodification (Shkoliar, 2021). The commodification of culture is a process in which cultural objects, ideas and symbols that may have previously had social, spiritual, symbolic or aesthetic value are transformed into goods or services that are bought and sold on the market for profit. The main aspects of the commodification of culture are highlighted:

1) The transformation of the intangible into the tangible is when ideas, traditions, knowledge, artworks, symbols, and even identity can be packaged and sold as commodities (books, music records, souvenirs, tourist packages, etc.).

2) Standardisation and mass production for the sake of achieving higher profits, can lead to the loss of uniqueness and authenticity of cultural products.

3) Marketing and branding to promote cultural elements in the marketplace, influencing their perception and value.

In other words, in the last stages of its development, an art cluster radically changes due to commodification, which once again illustrates the fluctuation of objects of this type. Thus, from an artistic and urban point of view, art clusters may well form a fluctuating space. From an urban point of view, this is manifested as a change in the functional purpose of the industrial zone, as well as the presence of informality and flexibility in the use of urban space. Informal galleries,

street art, and temporary installations appear, which can come and go, creating a fluctuating visual and functional landscape. From an artistic point of view, fluctuations in this type of space can be attributed to the fact that art clusters often emerge organically rather than according to a clear plan, and their development can be non-linear and difficult to predict, characterised by periods of rapid growth, stagnation or even decline of individual elements. In addition, art clusters usually unite different types of art, artists with different styles and approaches, as well as different types of creative institutions (galleries, workshops, studios, informal spaces). This internal diversity is constantly changing, with new players emerging, old ones disappearing, and new collaborations and conflicts emerging, leading to fluctuations in the artistic landscape. Moreover, some of the artistic initiatives within the cluster may be temporary, such as seasonal exhibitions, performances, and workshops, which adds an element of fluidity and fluctuation to the cluster space.

For a broader determination of how these fluctuating processes affect the spatial identity of art clusters, the philosophical concepts of space by M. Foucault (1986), A. Lefebvre (1991), J. Baudrillard (1994), in particular, Foucault's concept of heterotopias, is notable. These approaches can be used to view art clusters not only as physical territories but also as complex social and cultural constructs that are in a constant process of fluctuations between marginality and the aesthetics of the dominant culture.

### Philosophy of space in the context of art clusters

M. Foucault (1986) described spaces that are alternative to conventional social environments and can change their functions depending on socio-cultural transformations. The study coined the term heterotopia to describe places that go beyond the usual social norms and offer alternative forms of existence and interaction. According to M. Foucault (1986), several types of heterotopias can be distinguished. Heterotopias representing other places are spaces that reflect real or fictional places, creating certain conditional or mirror images of the world (for example, museums, libraries, parks). Time heterotopias are spaces that change or distort human perception of time. These can be buildings that have gone through several stages of change, or places for meditation and relaxation that interrupt the usual rhythm of life. For example, in the La Fabrica art cluster, Bofill used industrial elements of the complex, such as concrete towers, pipelines and huge brick facades, to create interiors, and instead of completely reconstructing the building, the decision was made to preserve its ruins, providing them new functions and meanings.

In 1973, the Spanish architect Ricardo Bofill came across an abandoned cement factory near Barcelona, a giant industrial structure with concrete towers, pipes and the remains of huge machines (Fig. 6). Instead of

demolishing the ruins, Bofill saw the potential to transform them into an artistic space that exists outside the usual concepts of architecture (Fig. 7).



**Figure 6.** The state of the abandoned La Fabrica cement factory in 1973. Exterior

Source: Architectuur (2014)



**Figure 7.** The state of Ricardo Bofill's La Fabrica art cluster after revitalisation

Source: ArchDaily (2023)

The architect preserved some of the factory's brick facades, concrete towers, and metal pipes and redeveloped them into living quarters, studios, offices, libraries, and exhibition halls (Fig. 8). Some of them remained intact, covered with greenery as a kind of architectural palimpsest. This created the impression of being suspended between times: the space was neither fully modern nor historical, but rather timeless. The factory lost its industrial function but retained its traces as an architectural memory. Thanks to this approach, La Fabrica is not only an artistic cluster but also a heterotopia of time in Foucault's sense, where different temporal, spatial and cultural layers intersect. The next type of heterotopia is crisis heterotopia, spaces that provide shelter to people in exceptional situations, such as hospitals, prisons, shelters or even bars, where people seek temporary help or a changed social status. Heterotopias as countercultural spaces or heterotopias of illusion are places that emerge out of protest against mainstream social norms. They can be amateur cultural spaces that reject traditional

urban norms. According to the classification, art clusters can be defined as heterotopias of illusion. They change the urban space, create new opportunities for cultural interaction, and act as alternative temporal-spatial structures that change traditional urban dynamics. Thus, art clusters are both marginalised in the context of gentrification and social change and aestheticised through artistic interventions, gentrification and cultural capitalisation.



**Figure 8.** A fragment of the interior of an office inside Ricardo Bofill's La Fabrica art cluster after revitalisation

Source: La Fabrica (n.d.)

In the context of the philosophy of art clusters' space, the approach of H. Lefebvre (1991) is also important in theoretical terms, as the study addressed space not only as a physical reality but also as a social construction that is formed through practices and interactions in it. In the concept of "space production", art clusters can be seen as spaces where various social practices, including artistic ones, transform spatial forms and functions. A. Lefebvre emphasised that space is not only a place for activities but also an active agent in creating social interactions and cultural identities.

The transformation of art clusters as fluctuating spaces from marginal to aestheticised within the gentrification process is also explained through the concept of simulacra by J. Baudrillard (1994). The simulacrum is a concept introduced by Jean Baudrillard that

describes the phenomenon when reality is replaced by its reflection or copy, which has no connection with the original. Baudrillard emphasises that in the context of contemporary capitalism, cultural phenomena that emerge in such spaces become not only signs or representations but also independent objects of consumption that are deprived of their original context. Graffiti and other forms of street art, originally aimed at protesting and criticising existing social structures, often turn into elements of a “cultural brand” that lose their radical nature in the process of aestheticisation and commodification. Such a change in the social context of a space leads to its “pseudo-reality”, where the authenticity of protest practices is lost, turning into a symbolic commodity. In the context of art clusters, simulacrum manifests itself through fake identities and ideas, and what was once an authentic expression of protest or marginality becomes part of the cultural production for tourists or part of the “fake” culture.

For instance, street art that protests against social norms can be commercialised and simplified to meet the demand for style and aesthetics. Protest practices that were once aimed at criticising society are aestheticised, turning into an aesthetic phenomenon that no longer serves social criticism but becomes a commodity. This creates the illusion of “authenticity” and can refer to the perception that a certain place is an “alternative”, although in reality it is already commercialised. An example is the Victoria district in Manchester, where the initial illegal artistic activity has become a marketing tool to attract investors and tourists. In Shoreditch in London, graffiti and street art, which began as illegal acts of protest, have become part of the area’s tourist attraction, losing their authentic protest character.

In this context, it is possible to define simulacrum and marginality in the process of gentrification as an important stage in the formation of art clusters, which stands on the verge of the duality of the social functions of an art cluster. As mentioned earlier, industrial squatting, which is a marginal phenomenon, precedes the gentrification stage, but given the fluidity of art clusters, it is possible to conclude that marginality and aestheticisation are invariably dualistic components of an art cluster. Gentrification turns marginal spaces into objects of cultural appeal, which leads to the loss of their underground character. Paradoxically, art clusters retain their aesthetic and cultural role in urban space but are increasingly becoming simulacra, losing their significance as places of social change and protest.

A significant contribution to understanding the transformation of space was made by R.M. Balzarotti & S. Moroni (2022) in an exploration of the political dimension of architecture and activism through design. The study emphasised that architectural and visual solutions are not only aesthetic but also political, marking the conflict between the spontaneity of marginal initiatives and the controllability of cultural policy, which

directly relates to the communication of street art in art clusters with visitors, as well as the impact of street art on various aspects of culture.

Thus, art clusters, as post-industrial heterotopias, function in a twofold dimension: on the one hand, they are spaces where social and cultural practices express their marginality, and on the other hand, in the processes of aestheticisation and commercialisation, they become part of the cultural industry. In this context, art clusters are fluctuating spaces that are located between the poles of marginality and aestheticisation, creating new opportunities for transformations of public space in the post-industrial city. Commodification and simulacra in art clusters are manifested through the processes of transforming authentic, often protest or marginal cultural practices into market products and cultural images that lose their original meaning. This creates an “illusion” of originality and counterculture.

### **Semiotics of space and the role of street art in shaping the identity of art clusters**

The semiotic analysis of art clusters described the complex interaction between the aestheticisation of space and its marginality in greater detail. As noted earlier, in the context of M. Foucault’s (1986) heterotopias, art clusters can be regarded not only as places of physical interaction but also as symbolic structures in which social, cultural and political meanings intertwine and transform. Such spaces are multidimensional, where each element has a unique cultural and social load, and the transformation in the context of marginality and aestheticisation is one of the important aspects of the development of post-industrial territories.

Street art, in particular graffiti and street art, act as the main semiotic tools in the processes of marginalisation of art clusters and subsequent aestheticisation. In the marginalised context, graffiti functions as a form of protest, expression of alternative views and struggle against the commodification of space (Kalashnyk, 2024). This type of art, according to Kalashnyk (2024), is an effective tool of visual protest, capable of mobilising social movements, broadcasting socially significant messages and shaping cultural consciousness in public space, and is the “visual voice” of those who are on the periphery of the dominant culture and seek to express their views through radical interventions in urban space. An example of such use is spaces such as Tacheles in Berlin, where graffiti served as a manifesto questioning the city administration and private developers, acting as a powerful tool of protest (Hnatiuk, 2020). V. Mehrotra (2021) highlighted that an important aspect was that graffiti in these spaces not only expresses protest but also serves as an “empty” semiotic sign that can acquire new meanings depending on the context.

Over time, with the process of cultural capitalisation of art clusters, graffiti and street art may lose their original protest essence, turning into an aesthetic attribute

that supports the “cultural brand” of the art cluster. As noted by V. Molnar (2018), the process of aestheticisation and commercialisation of street art leads to the fact that these practices become part of consumer culture, which in turn leads to the loss of original critical function. This process can be seen in contemporary art clusters, where graffiti becomes an element of the city’s tourist image, transforming from a symbol of protest into a symbolised aesthetic of the urban environment.

The duality of protest and commercialisation corresponds to the concept of Foucauldian heterotopias, where marginal and institutionalised practices coexist. Street art in art clusters can be regarded as a “threshold practice” that lies on the borderline between radical self-expression and an attempt to integrate into official culture. In particular, the aestheticisation of marginal spaces through street art contributes to the change in the socio-cultural identity of art clusters. For example, the Tacheles art cluster in Berlin (Fig. 9), where street art is becoming an important tool for expressing local identity, protesting against social injustice, and engaging with marginalised groups (Tartari, 2019).



**Figure 9.** Staircase with graffiti in the Tacheles art cluster in Berlin

**Source:** U. Gultmair (2021)

Thus, a semiotic approach to the study of street art in art clusters has revealed the complex processes of transformation of marginal spaces into culturally significant and aestheticised environments. In this context, street art acts as an intermediary between illegality and legitimation, protest and commercialisation, authenticity and marketing strategies. As a result, after the stage of marginalisation, i.e. industrial squatting, the development of art within the art cluster leads to the stage of aestheticisation and cultural capitalisation, which causes the transformation of the space from a countercultural environment to a cultural centre, losing its status as a heterotopia. For example, the Platforma art factory in Kyiv (Fig. 10), which emerged on the territory of a former industrial zone, has become a venue for major festivals and exhibitions. However, as O. Ivashko (2021), this process has also led to

gentrification, displacing the original residents and marginalised groups who were the first to make this space culturally significant.



**Figure 10.** A fragment of the interior of the hall of the Platforma Art Factory art cluster in Kyiv

**Source:** Artzavod Platforma (n.d.)

Based on the analysis of art clusters and the literature, it is possible to argue that street art performs an important semiotic function, transforming from a means of protest to an instrument of cultural capitalisation. It reflects the dynamics between marginality and institutionalisation, playing a key role in shaping the identity of post-industrial spaces. Art clusters emerge as heterotopian environments where authenticity and commercialisation coexist, and street art becomes a marker of cultural transformation and rethinking of urban values.

## CONCLUSIONS

The study analysed art clusters as fluctuating post-industrial spaces that simultaneously accumulate features of marginality and aestheticisation. Using an interdisciplinary approach, the study determined that such spaces are not stable structures, but are constantly changing under the influence of social, economic and cultural processes. Art clusters go through a series of stages from industrial squatting to cultural capitalisation, while their marginality is gradually aestheticised and institutionalised. In this process, authentic protest practices lose their original function, transforming into simulacra that serve as elements of the cultural industry. There are 2 types of art clusters: “underground transformations” and “managed creative zones” that emerge either as a result of industrial squatting (type 1) or support from cultural institutions (type 2).

Street art is crucial in the transformation of art clusters, as it is both a tool for a semiotic redefinition of space and a marker of its changing identity. Graffiti and street art serve as “threshold practices” that illustrate the dynamics of the transition from countercultural to commercialised space. The philosophical concepts

of Foucault's "heterotopia", Lefebvre's "production of space" and Baudrillard's "simulacrum" were used to critically reflect on the mechanisms of cultural appropriation and symbolic redefinition of the post-industrial environment. Thus, art clusters can be interpreted as heterotopias of a new type, fluctuating spaces that constantly balance between the opposite poles of marginality and institutionalisation, spontaneity and control, authenticity and simulation.

Promising areas for further research include analysing the impact of art clusters on local communities in the context of gentrification, studying inclusion/exclusion policies in the context of cultural planning,

comparative study of the fluctuating nature of such spaces in different socio-cultural contexts, and delving into the essence of art clusters of the 2<sup>nd</sup> type of "managed creative zones" in the urban and artistic dimensions.

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## Постіндустріальні гетеротопії: арт-кластери як флуктуаційні простори між маргінальністю та естетизацією

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**Анотація.** Актуальність дослідження зумовлена необхідністю осмислення просторових трансформацій постіндустріальних територій у контексті культурної динаміки та естетизації маргінальних мистецьких практик. Метою статті був аналіз арт-кластерів як флуктуаційних постіндустріальних просторів, що існують між маргінальністю та естетизацією, розкриття механізмів та стадій їх трансформації від контркультурних ініціатив до культурно-комерційних об'єктів. Методологічною основою статті був міждисциплінарний підхід, який поєднав філософські, культурологічні та урбаністичні методи аналізу, а також метод кейс-стаді та візуально-семіотичний аналіз. У роботі запропоновано поєднання концепцій Фуко, Лефевра та Бодрійяра для аналізу культурної трансформації арт-кластерів як постіндустріальних просторів, що дозволило не лише описати зміни в урбаністичному середовищі, а й критично осмислити процеси легітимації маргінального культурного контенту. Подано авторську типологію арт-кластерів відповідно до особливостей формування. У результаті аналізу виявлено, що арт-кластери 1-го типу – «андеграундні трансформації» (відповідно до авторської типології арт-кластерів) функціонують як динамічні просторові конструкти, у яких відбувається трансформація маргінальних ініціатив у легітимні культурні практики. Просторові інтервенції, зокрема вуличне мистецтво, виконують роль семіотичних маркерів, що формують нову ідентичність місця та сприяють його естетичному переозначенню. Водночас встановлено, що процеси комодифікації та символічної апропріації ведуть до втрати автентичності протестних практик, трансформуючи їх у симулякри. Практична цінність дослідження полягає в можливості використання результатів для критичного аналізу політик міського розвитку, культурного планування та реконцептуалізації публічного простору в умовах постіндустріальної трансформації

**Ключові слова:** мистецьке середовище; джентрифікація; вуличне мистецтво; семіотика простору; комодифікація культури; симулякр



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## Fine art photography as a form of visual art: Aesthetics, styles, and contemporary trends

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**Abstract.** The study aimed to analyse fine art photography as a form of visual art, its aesthetic characteristics, stylistic evolution, and contemporary developmental trends. The research was based on the analysis of art-historical works, exhibition catalogues, artistic practices of leading photographers, as well as content analysis of digital platforms and the non-fungible token market. The study established that fine art photography has transcended its traditional documentary function and acquired the status of an autonomous conceptual medium, integrating elements of painting, cinematography, performance, and digital technologies. It was found that the stylistic transformations of fine art photography have been accompanied by experiments with form, light, composition, and narrative structure, particularly evident in the development of such movements as conceptual, staged, and minimalist photography. The results confirmed that fine art photography has evolved into a multidimensional artistic practice that combines visual aesthetics with conceptual content and actively interacts with other art forms. It was revealed that contemporary photographers not only experiment with genres and techniques but also shape new modes of audience engagement through digital platforms, the non-fungible token technologies, and social media. The study demonstrated that digital technologies open new possibilities for photographers, particularly in algorithmic editing, generative art, and the non-fungible token economy, while simultaneously transforming the methods of presentation and artist-audience interaction. The findings may be applied in art education, curatorial practice, and the development of new digital exhibition formats

**Keywords:** pictorialism; postmodernism; non-fungible tokens; interactive media; cultural identity; conceptualism

### INTRODUCTION

Photography as an artistic practice has undergone a complex developmental trajectory, transforming from a documentary tool into an independent branch of visual art (Hirsch, 2024). Since 2005, fine art photography has become an integral part of contemporary visual art, demonstrating significant stylistic and conceptual breadth. The proliferation of artistic photographic practices, their recognition within high art, and the active integration of digital technologies have necessitated a comprehensive study of its aesthetic characteristics, stylistic features, and emerging trends. Research on fine art photography is particularly relevant due to its transformation under the influence of technological progress, shifting artistic paradigms, and the expansion of artistic discourse. The use of artificial intelligence,

algorithmic image editing, generative technologies, and augmented reality has given rise to a new form of photographic expression that remains understudied in academic discourse. These novel techniques have not only influenced the technical aspects of photographic creation but have also challenged conventional notions of authorship, composition, and conceptual structure in fine art photography, raising new ethical and philosophical questions regarding artistic autonomy.

Alongside traditional approaches rooted in pictorialist or modernist methodologies, there has been an active development of new conceptual strategies, particularly post-media photography, which integrates multiple visual mediums (Paić, 2021). Technological experiments with images, expanded photography, and hybrid

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media have become defining characteristics of contemporary photographic art, necessitating a re-evaluation of its aesthetic boundaries. Given the shifting artistic paradigms, an updated analysis of the stylistic typology of fine art photography is required – one that accounts for both traditional and experimental forms. Academic research on fine art photography has progressed along several trajectories, including historical-theoretical, stylistic, and technological inquiries. A comprehensive analysis of the evolution of photographic art is presented in the work of L. Wells (2021), which examines the transition from pictorialism to modernist and post-modernist practices. The study by G. Rose (2022) focused on contemporary artistic strategies, identifying key visual trends, particularly conceptual and staged photography. R.D. Winfield's (2023) research primarily addressed the question of photography's legitimacy as an art form, analysing its mechanical nature in contrast to traditional visual arts and exploring the challenges it faced in gaining recognition as a full-fledged graphic art medium. A. Abdul Rahman & N.N. Azmi (2024) examined fine art photography as a means of self-expression through the interplay of personal identity, emotional expressiveness, and artistic practice, analysing how photography transcends mere documentation of reality to become an instrument of personal and creative self-discovery. Their work emphasised the role of composition, lighting, subject selection, and post-processing in crafting images that facilitate emotional impact and the communication of ideas. A. Solomon-Godeau (2021) investigated postmodernist tendencies, including appropriation, performativity, and visual citation.

A portion of the research has been dedicated to technological transformations in photographic art. C. Liu (2022) analysed the interrelations between technology, humans, and digital-physical spaces through digital photography practices, exploring how social media and mobile applications influence the perception of photography and its aesthetic qualities. The existing academic literature contains gaps that warrant further investigation. The impact of cutting-edge digital technologies – particularly artificial intelligence and augmented reality – on artistic photography remains underexplored. Contemporary shifts in aesthetic criteria under the influence of technological progress also lack sufficient conceptualisation within scholarly discourse. Furthermore, the global dynamics of fine art photography beyond the Western artistic context have yet to receive adequate attention.

Within contemporary Ukrainian academic discourse, the study by O.L. Khramova-Baranova & V.S. Zytseva (2021) merits consideration for its analysis of the evolution of Ukrainian photographica through the lens of the interaction between realist and abstract visual structures. The authors focused on the influence of European and American theoretical schools on Ukrainian photographic practice, as well as tracing the stylistic

transformation of Ukrainian fine art photography within the framework of constructivist aesthetics. This approach provided grounds for regarding Ukrainian fine art photography as a distinct visual phenomenon with clearly defined historical and cultural parameters. Conversely, T. Mironova's (2021) work conducted a cultural-semiotic analysis of visualisation processes in media art, treating photography as a tool for shaping virtual artistic space. Particular attention is given to the interactive, communicative, and multimedia aspects of new forms of visual art, which significantly expand the possibilities of artistic expression and present considerable heuristic potential for analysing contemporary trends in fine art photography.

The aim of this study was to systematise the aesthetic characteristics, stylistic movements, and contemporary trends in fine art photography within the context of its interaction with technological, conceptual, and social factors. Identifying key stylistic tendencies and their correlation with traditional artistic criteria has allowed for outlining the principal directions of fine art photography's further transformation.

## **MATERIALS AND METHODS**

The research was conducted between 2024 and 2025 and involved an analysis of a broad spectrum of theoretical and practical sources related to the development of fine art photography as a form of visual art. To ensure a comprehensive approach, academic publications, art-historical monographs, exhibition catalogues, and works by contemporary photographers were selected. The analysed sources included theoretical works addressing the historical stages of fine art photography's development, questions of its aesthetics, stylistic shifts, and the influence of technological factors on the creation and dissemination of photographic works. Specifically, studies exploring the relationship between fine art photography and conceptual art, postmodernist tendencies, and digital technologies were utilised. The research incorporated exhibition catalogues from the Museum of Modern Art (1940; 1955; 1967; 1997), Tate Modern (2014; 2018; 2020), and Centre Pompidou (2024; 2025). Significant attention was devoted to examining the artistic practices of prominent fine art photography practitioners, including Cindy Sherman (Museum of Modern Art, 1997), Gregory Crewdson (Templon, n.d.), Andreas Gursky (White Cube, 2025), Barbara Kruger (1987), and Andrew Rovenko (Pictorial List, 2021).

A distinct focus of the research was the study of digital space as an environment for contemporary fine art photography. A content analysis was conducted on the representation of fine art photography across digital platforms, including Instagram, Behance, NFT marketplaces (non-fungible token), and online exhibition initiatives. This allowed for an assessment of how digital culture transforms modes of presentation and interaction between artists and audiences, as well

as its impact on the commercialisation of photographic art. The research was carried out in several stages, each aimed at a comprehensive examination of fine art photography in terms of its aesthetic features, stylistic evolution, and contemporary trends. The first stage involved an in-depth analysis of theoretical sources, enabling the identification of key concepts, categories, and frameworks necessary for further study. Materials documenting the historical development of fine art photography, shifts in stylistic approaches, and its transformation within the digital artistic milieu were selected and systematised. The subsequent stage entailed an examination of artistic practices through the analysis of selected photographic works. Each case study was evaluated according to criteria such as composition, chiaroscuro techniques, narrative structure, the application of digital post-processing methods, and the interaction of photography with other artistic genres. A comparative analysis of traditional analogue techniques and contemporary digital approaches was conducted, facilitating the identification of stylistic shifts and emerging trends in fine art photography.

Further analysis focused on the relationship between artistic photography and digital technologies. The study examined how algorithmic editing, artificial intelligence, and generative art influence the creation of photographic images. The technical possibilities of using cutting-edge software tools for artistic photography were explored, along with their impact on the aesthetics and conceptual structure of photographic works. A separate research direction involved evaluating the digital environment as a space for the functioning of fine art photography. The study analysed the specifics of presenting photographic art on digital platforms such as Instagram, Behance, and NFT marketplaces, as well as shifts in communication strategies between artists and audiences. Digital exhibition formats, NFT auctions, and the influence of social media on the public perception of artistic photography were also investigated. Thus, the materials and methodological approaches employed enabled a comprehensive analysis of fine art photography, encompassing historical, aesthetic, technological, and socio-cultural aspects of its development.

## RESULTS AND DISCUSSION

Throughout the 20<sup>th</sup>-21<sup>st</sup> centuries, fine art photography gradually established itself as an autonomous art form integrating technical and conceptual experimentation. In the first decades following its invention (1830s-1840s), photography was predominantly perceived as a means of documenting reality, playing a crucial role in scientific, journalistic, and archival practices (Pavlidis, 2022). However, by the late 19<sup>th</sup> and early 20<sup>th</sup> centuries – particularly with the rise of Pictorialism in the 1880s-1910s – artists began actively employing photography to express conceptual and aesthetic ideas, striving to elevate its status as an artistic medium on par

with painting and other art forms (Sailor, 2022). This process intensified further in the 1920s-1930s with the emergence of experimental and avant-garde photography, advanced by proponents of *Neues Sehen* (New Vision) and Surrealism. One of the overarching trends of the early 20<sup>th</sup> century was a significant expansion of thematic range and formal experimentation, marked by a shift from classical landscapes and portraits to conceptual staging, abstract compositions, and multimedia works (Stuart, 2014). During this period, photography gradually liberated itself from purely documentary functions, demonstrating its capacity for subjective expression. By the late 20<sup>th</sup> century, the transition from analogue to digital photography enriched artists' technical possibilities (editing, collage, compositing, etc.) while simultaneously raising questions regarding authenticity and the limits of image manipulation. Thanks to cutting-edge digital technologies, photographers gained the ability not only to edit images but also to combine different media, creating visual narratives that transcend traditional photographic formats.

In the course of its development, fine art photography gave rise to a number of stylistic movements. These reflect diverse aesthetic approaches and authorial concepts, evolving under the influence of socio-cultural shifts and technological innovations. Contemporary artistic photography has demonstrated a tendency towards genre synthesis, the use of new technologies, and integration with other art forms, making it a vital component of today's visual environment. Conceptual photography is a movement in which the photographic image serves primarily as a vehicle for conveying an idea rather than merely documenting reality (Elshafie, 2023). Artists in this genre employ photography as a tool for visualising concepts, which may encompass social commentary, identity exploration, or the deconstruction of cultural stereotypes. Within this approach, artists frequently utilise symbolic imagery or composite techniques, creating multilayered compositions. One of the most iconic examples of conceptual photography is the work of Cindy Sherman, particularly her *Untitled Film Stills* series (1977-1980) (Fig. 1).

Cindy Sherman's photographs from the *Untitled Film Stills* series demonstrated a profound integration of cinematographic techniques into photographic art, evident in the specific framing, compositional structure, and use of lighting effects (Nappo *et al.*, 2024). The visual structure of her works adheres to the principles of cinematic imagery. The camera is often positioned at an angle, employing both low and high shooting perspectives. Such techniques contribute to the creation of a dramatic effect, heightening the expressiveness of the scene and generating visual tension. Light and shadow played a pivotal role in the composition of the works, aligning them with the aesthetics of film noir. The conceptual foundation of the *Untitled Film Stills* series was rooted in the deconstruction of female

archetypes entrenched in mass culture (Museum of Modern Art, 1997). Sherman embodied stereotypical characters from popular cinema, such as the housewife, secretary, or film star, using them as a means of critically analysing the representation of women in society. Sherman's heroines appear at a moment of potential narrative development, yet this artistic concept remains open-ended, compelling the viewer to construct the subsequent scenario independently.



**Figure 1.** Cindy Sherman's Untitled Film Stills series  
**Source:** Museum of Modern Art (1997)

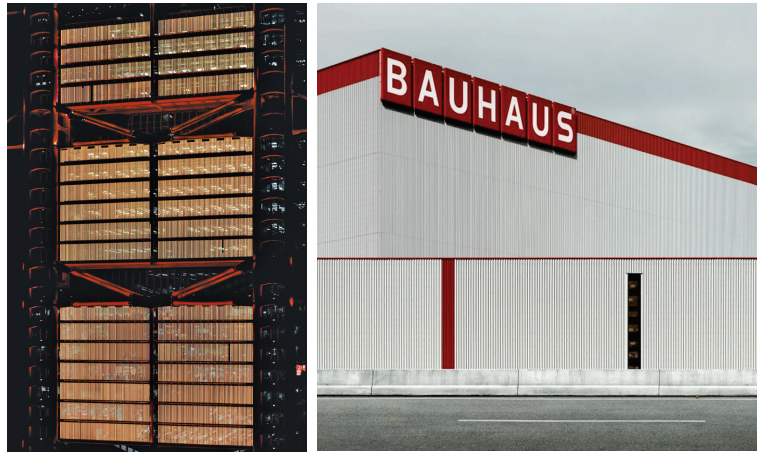
Another prominent direction is staged photography. This style is characterised by meticulously planned scene arrangements prior to shooting, akin to a cinematic approach (Strožek, 2016). Photographers construct elaborate sets, work with actors, lighting, and special effects to achieve a single, perfected frame. Gregory Crewdson is one of the most renowned practitioners of staged photography. His works are distinguished by their cinematic scale and atmospheric quality (Özbek, 2023). For instance, the *Eveningside* series (2021-2022) consists of large-format black-and-white photographs depicting twilight suburban scenes. Each of Crewdson's shots results from an extensive preparatory process involving detailed storyboarding, set construction, actor coordination, and complex lighting setups. The series captures frozen moments from the mundane life of American provincial towns (Fig. 2).



**Figure 2.** "The Corner Market" from Gregory Crewdson's *Eveningside* series  
**Source:** Templon (n.d.)

Crewdson also employs cinematic visual techniques – particularly those of film noir and Edward Hopper's aesthetics – such as dramatic lighting, fog, and rain, to imbue his scenes with a melancholic, sometimes gothic, mood. The evolution of staged photography can be traced from the vibrant, often brightly coloured tableaux of the 1980s-1990s (e.g., the works of Jeff Wall) to contemporary complex narratives, as seen in Crewdson's oeuvre, where every detail within the frame is laden with symbolism. *The Corner Market* is constructed according to principles of perspectival depth, reminiscent of classical cinematic compositions. The vertical and horizontal lines of electrical wires, building facades, and road markings form visual axes that guide the viewer's gaze into the depths of the scene. A slight deviation of the central element – the female figure – from the geometric center lends the frame a sense of naturalism and dynamism.

Abstract and minimalist photography focuses on forms, colours, textures, and the structural arrangement of the frame, departing from traditional narrative conventions. Such images approach the realm of abstract painting or graphic art, often devoid of a conventional focal point. Many of these works are large-scale, emphasising minute details and transforming them into monumental patterns (Bence, 2022). One of the most iconic contemporary artists in this vein is Andreas Gursky, renowned for his expansive colour photographs that depict a globalised world through generalised imagery – stock exchange floors, building facades, industrial spaces (Fig. 3). At first glance, his scenes appear realistic; however, Gursky extensively employs digital editing to create perfectly symmetrical or repetitive structures, eliminating incidental elements (White Cube, 2025). Such interventions lend the photographs a minimalist, universalised appearance, aligning them with the conceptual framework of abstract art.



**Figure 3.** Architectural photographs by Andreas Gursky

**Source:** White Cube (2025)

Figure 3 depicts the facade of a bank building in Shanghai, composed of geometrically arranged light panels. The composition is built upon the repetition of modular elements, creating a visual rhythm and sense of order. The contrast between warm lighting and the darkened structural details enhances the photograph's expressiveness and intensifies the perception of spatial depth. The symmetry of the composition and the rigorous organisation of elements align this image with the formal language of minimalism, where the architectural object becomes an autonomous artistic creation, and its utilitarian function assumes secondary importance. Figure 3 presented a building facade featuring a textual logo. The visual composition relies on the contrast be-

tween white panels, red accents, and a monochromatic sky, emphasising the structure's austere functional character. The image's structure is based on precise geometry, rationality, and formal simplicity. Vertical elements introduce a point of tension, disrupting the rhythmic monotony. Figure 4 showcased a minimalist space dominated by the colour red. The expansive solid surfaces evoke the painted canvases of Barnett Newman or Mark Rothko, in which colour itself becomes the subject of aesthetic inquiry. The inclusion of human figures in the lower portion of the composition disrupts the scene's absolute abstraction while accentuating the contrast between human presence and the monumentality of architectural space.



**Figure 4.** Andreas Gursky's photograph "Review"

**Source:** White Cube (2025)

The minimalist and abstract photography exemplified in Andreas Gursky's works demonstrated an expansion of traditional photographic vision. By focusing on form, colour, and structure, these works eschew direct narrative in favour of aesthetic engagement with the viewer. The architectural compositions, perfectly

balanced forms, and interplay of colour planes create an effect in which reality is transformed into a visual concept. The integration of text with photography has given rise to a distinctive style situated at the intersection of photographic art and graphic design, where verbal messaging becomes an intrinsic component of the

visual image (Chiocchetti, 2021). The incorporation of text – whether as a slogan, quotation, or commentary – adds an additional semantic layer, often altering or amplifying the primary perception of the image. This approach enables photography to transcend purely visual form, transforming it into a medium for social commentary and critical reflection.

One of the key figures in the development of this direction is the American artist Barbara Kruger, who, since the late 1970s, has produced collages combining found photographic images with brief, often provocative textual phrases. Her signature style – featuring bold, crisp typography against high-contrast backgrounds – has become iconic in contemporary art. Statements such as “I shop therefore I am” employ irony and sharpness to engage with pressing social issues (Fig. 5).



**Figure 5.** Photograph “I shop therefore I am” by Barbara Kruger

**Source:** B. Kruger (1987)

B. Kruger’s aesthetic strategy was rooted in the visual language of mass culture (Smith, 2022). With a professional background in graphic design and magazine layout, she appropriated the stylistic conventions of advertising posters to capture the viewer’s attention while simultaneously subverting their standard function. Contemporary photo artists actively experiment with narrative, technique, and presentation formats, synthesising multiple genres and interpreting current sociocultural realities (Filimowicz, 2023). One of the defining trends in contemporary photography is the fusion of documentary realism with conceptual imagery, enabling artists to craft deeply personal yet universally resonant narratives. A striking example of this approach is the *Rocketgirl Chronicles* (2020-2021) series by Ukrainian-Australian photographer Andrew Rovenko (Fig. 6).

A. Rovenko created this series during the pandemic lockdown, photographing his daughter dressed in an astronaut costume. This childhood game acquired symbolic significance, as the familiar domestic space, constrained by quarantine measures, was transformed into an uncharted planet for the young protagonist. Thus, the series combined documentary elements (capturing

pandemic-era realities) with a fantastical conceptual narrative, reflecting a child’s capacity for imaginative world-building. The photographs are distinguished by meticulously composed frames reminiscent of cinematic aesthetics. Each shot balances the environment and the protagonist – for instance, in the scene with industrial containers, the architectural structure of the space evoked a sense of alienation, while the child-astronaut became the focal point, symbolising isolation. A key aspect of the series is its stylistic treatment, particularly the use of analog film as a medium. This imparts a soft, nostalgic colour palette, evoking retrofuturist aesthetics. As such, *Rocketgirl Chronicles* not only conveyed an intimate family story but also crafted a universal allegory of contemporary reality, in which individuals must adapt to unprecedented circumstances.



**Figure 6.** *Rocketgirl Chronicles* photo series by Andrew Rovenko

**Source:** Pictorial List (2021)

Of particular note is the contemporary Fine Art Weddings movement – artistic wedding photography characterised by a bright film aesthetic, soft lighting, deliberate composition, and emotional expressiveness. This style merges documentary authenticity with artistic vision, elevating wedding photography to the realm of high art. Among its most renowned practitioners are Jose Villa and Elizabeth Messina, whose works are

distinguished by refinement, chromatic depth, and meticulous attention to detail. Their contributions have shaped a new aesthetic within wedding photography, gaining recognition not only in commercial circles but also in the fine art world (Fig. 7).



a)



b)

**Figure 7.** Fine art weddings photography

**Note:** a – Jose Villa; b – Elizabeth Messina

**Source:** Jose Villa (n.d.); E. Messina (n.d.)

Modern technologies have significantly influenced fine art photography practices, unlocking new creative possibilities and expanding channels for the presentation and dissemination of photographic art. The emergence of NFTs in 2021 impacted various spheres of digital art, including photography. NFT technology, based on blockchain, enables the authentication of ownership for digital images, ensuring their uniqueness and facilitating direct sales without intermediaries (Beckman, 2021). This allows photographers and collectors to transact directly via specialised marketplaces, bypassing traditional galleries or auction houses. Photography has proven particularly suited to the NFT format, as most images in contemporary society are primarily consumed digitally on screens. This has not only enabled the commercialisation of digital copies but also introduced the concept of digital scarcity, previously difficult to achieve in digital art. Many prominent photographers, including Joel Meyerowitz, Gregory Crewdson, and Alec Soth, began

tokenising their works or archival materials during the NFT boom, experimenting with this new distribution model (Wiley, 2023). In response to growing demand for NFT photography, dedicated platforms and marketplaces (OpenSea, Foundation, SuperRare) emerged, specialising in the sale of digital photographs as NFTs.

The NFT phenomenon in fine art photography has a dual impact. On one hand, it grants photographers direct access to a global collector base, allowing them to retain greater profits while offering buyers certified uniqueness. This has disrupted traditional distribution systems, where galleries and dealers played a pivotal role in determining value and commercial viability. In this context, NFTs have democratised the art market, creating alternative models for monetising creativity (Cooke, 2024). On the other hand, the NFT market proved to be speculatively overheated during its rapid growth, casting doubt on the long-term artistic value of such sales. A significant portion of the NFT art market operated on the principle of financial speculation, where collectors purchased tokens for resale purposes rather than out of artistic interest (von Wachter *et al.*, 2022). Nevertheless, even after the hype subsided, NFTs remain an important tool for the distribution of photography. Contemporary museums have begun digitising their collections as NFTs, while photographers explore the possibilities of new digital concepts of ownership and scarcity.

Significant changes in the ways photography is exhibited and popularised have also occurred due to social media platforms such as Instagram, Facebook, Pinterest, and Behance (Patricio, 2024). These platforms have created a new ecosystem for Fine Art photographers, enabling artists to engage directly with audiences, build their personal brand, and even sell their works without traditional intermediaries. Instagram, in particular, has significantly influenced the expansion of photographic art, making it accessible to millions of users worldwide (San Cornelio, 2022). It has fostered not only the popularisation of photography but also the emergence of new visual strategies aimed at engaging viewers through dynamic content. Social media, in general, facilitates the development of photographic communities, providing authors with opportunities to participate in online competitions, flash mobs, and thematic projects. For instance, photographic challenges stimulate knowledge exchange and new forms of visual expression. For emerging artists, these platforms also serve as a potential launchpad, as curators and gallerists increasingly monitor social media in search of new talent.

However, challenges exist. Social media algorithms shape a certain visual aesthetic that may influence artists' creative processes. Since algorithmic mechanisms promote images that receive the most engagement (likes, comments, reposts), this may encourage photographers to adopt uniform, "catchy" visual solutions that do not always align with their artistic intentions

(Siang Yang, 2023). Despite these contradictions, maintaining a presence on social media has become almost obligatory for photographers seeking professional growth. These platforms complement traditional modes of communication (galleries, festivals, print publications), allowing artists to promptly present their works to audiences and initiate discussions around their art.

NFTs and social media have fundamentally transformed the ways photography is created, distributed, and popularised. NFTs have opened new avenues for monetising digital images and emerged as an alternative art market mechanism, though debates about their artistic value persist. Social media, in turn, have redefined how photographers interact with the public, creating new opportunities for self-presentation, community-building, and creative experimentation. These transformations indicate the continued expansion of photography as an artistic medium that integrates traditional practices with digital and virtual formats. Regardless of the contentious nature of these changes, they confirm that contemporary photographic art is in a state of constant evolution, opening new perspectives for artists and audiences alike. The exhibition strategies of photographic art in leading global museums attest to its established position in contemporary artistic discourse and demonstrate diverse curatorial approaches to its presentation. An analysis of the exhibition policies of the Museum of Modern Art in New York, Tate Modern in London, and the Centre Pompidou in Paris has revealed how photography is integrated into broader museum discourse, unfolds its thematic, historical, and conceptual dimensions, and how these institutions shape contemporary perceptions of its role within the system of visual arts.

The Museum of Modern Art (MoMA) was one of the first institutions to grant photography full-fledged artistic status, establishing a dedicated department in 1940 under the leadership of Beaumont Newhall and later the legendary curator Edward Steichen (Museum of Modern Art, 1940). A pivotal moment was the exhibition *The Family of Man*, which affirmed photography as a universal language of human experience (Museum of Modern Art, 1955), while the *New Documents* project defined documentary photography as a means of artistic expression (Museum of Modern Art, 1967). In the 1990s, the museum continued its active engagement in this direction, exemplified by the acquisition of Cindy Sherman's entire *Untitled Film Stills* series in 1995, ensuring the preservation of this seminal cycle in a public collection (Museum of Modern Art, 1997). MoMA's collection encompasses thousands of photographs, ranging from classics such as Alfred Stieglitz and Robert Frank to contemporary figures like Wolfgang Tillmans and Nan Goldin. The museum's exhibition strategy is based on an integrative approach: photographic works are incorporated into the broader museum narrative alongside painting, video art, and installations,

underscoring their equal standing in the artistic process of the 20<sup>th</sup>-21<sup>st</sup> centuries. At the same time, the museum employs innovative formats, including digital archives and interactive platforms, allowing audiences to explore photographic heritage in depth.

Unlike the Museum of Modern Art, London's Tate Modern does not have a dedicated photography department, yet since its opening in 2000, it has consistently incorporated photography into its exhibition spaces. Tate's strategy is rooted in a conceptual approach that positions photography as a medium evolving through interaction with other arts and societal challenges. The project *Shape of Light: 100 Years of Photography and Abstract Art* (Tate Modern, 2018) explored the interplay between photography and abstract painting, demonstrating how these two fields developed in parallel and influenced one another. Another exhibition, *Conflict, Time, Photography* (Tate Modern, 2014), innovatively presented war photography not through a traditional chronological lens but through the duration of time after the event, examining how photographic memory shifts depending on the temporal distance between the moment of capture and the viewer's experience. Tate has also actively investigated performativity in photography, as vividly demonstrated in the Zanele Muholi exhibition (Tate Modern, 2020), where photography converged with installation and textile materials. This approach seeks to blur genre hierarchies and illustrates that photography can not only document reality but also serve as a medium reflecting on social, political, and aesthetic phenomena.

The Centre Pompidou in Paris is one of the most influential institutions in photographic art, housing one of the world's largest photography collections, comprising over 45,000 prints and 60,000 negatives. Since its founding in 1977, the museum has placed particular emphasis on avant-garde and conceptual photography, including works by Surrealists, proponents of the *New Vision* movement of the 1920s-30s, and post-war humanist photography. A key feature of the Centre Pompidou's collecting policy is its strategy of retrospective representation, aimed at filling gaps in the photographic canon, particularly through the active inclusion of works by women photographers and artists from Africa, Eastern Europe, and other historically underrepresented regions. The Centre Pompidou's exhibition projects often adopt a research-oriented approach, as seen in *Corps à corps – histoire(s) de la photographie*, which re-examined the nude genre and representations of the human body beyond traditional portrait categories. This strategy underscores the museum's curatorial activism in championing photography as an equal art form – one that not only documents reality but also shapes its cultural reinterpretation.

An analysis of the exhibition strategies of these three leading museums reveals a shared tendency towards integrating photography into broader artistic

discourse, affirming its status as an autonomous artistic medium. The Museum of Modern Art emphasised historical continuity and innovation, merging classical and contemporary photography within a cohesive narrative. Tate Modern approaches photography through the lens of intermedial connections, exploring its potential within the context of social and conceptual shifts. The Centre Pompidou focuses on curatorial activism and expanding photography's historical representation, ensuring its full inclusion in museum spaces. This approach attests to the maturity of photography as an artistic practice engaged in constant dialogue with other visual arts while remaining a key instrument for reflecting on cultural, historical, and social processes.

Based on the research findings, fine art photography can be characterised by internationalisation (photographic artists from various countries gaining access to a global audience) and integration with related arts (performance practices). This confirms that fine art photography is a mature, conceptually rich field of art that is actively evolving. The obtained results demonstrated that fine art photography occupies a central position in contemporary artistic discourse, affirming its status as a fully-fledged form of visual art. It serves not merely as a means of documenting reality but also as a conceptual tool for artistic expression, integrating diverse media, including painting, cinema, graphic design, and digital technologies. This multidimensionality makes photography a unique platform for experimenting with visual language and modes of presentation. It also demonstrated its ability to adapt to new cultural contexts and respond to contemporary challenges while retaining its artistic potential. The study confirms that contemporary fine art photography is neither static nor an isolated domain; rather, it exists in dynamic dialogue with other artistic practices, necessitating continuous reinterpretation. This approach is crucial not only for artistic practice but also for scholarly analysis of transformations in the contemporary visual sphere, as it allows for tracing the interplay between technological advancements, societal changes, and artistic experimentation.

Results of the study demonstrated that the expansion of stylistic possibilities in artistic photography throughout the 20<sup>th</sup> century was a complex yet logical process. Beginning with Pictorialism, which sought to legitimise photography's artistic status by emulating painting, photography gradually moved beyond its purely documentary function. Experimental movements, particularly *Neues Sehen* (New Vision) and Surrealism, played a pivotal role in this process by challenging traditional principles of photography as a mechanical reproduction of reality. *Neues Sehen* fostered the development of novel compositional techniques, experimenting with angles, lighting, and contrasts, thereby significantly broadening photographic expression. Meanwhile, Surrealism employed photography as a means of visual manipulation and subversion

of established perceptions of reality, actively utilising photomontage, double exposures, and staged scenes. The expansion of genre boundaries had profound consequences, including the gradual emergence of conceptual photography, staged photography, and minimalist compositions, which are now defining features of fine art photography. Thus, the findings indicate that photography progressively departed from its initial representational function and evolved into an autonomous artistic discourse in which conceptual depth and formal presentation hold equal significance.

One of the key aspects of the study was identifying the role of conceptual photography in shaping contemporary artistic strategies. The research confirmed that this movement, exemplified by artists such as Cindy Sherman, Barbara Kruger, Sophie Calle, and others, became an essential tool for the artistic analysis of social constructs, political realities, and cultural codes. Cindy Sherman's works demonstrated that photography could serve not only as a medium of visual communication but also as an instrument for critically examining societal norms. She employed photography to deconstruct archetypal female representations in mass culture, inviting viewers to critically reassess established portrayals. This aligns with the findings of T. Zheng & X. Lin (2024), who argued that conceptual photography utilises cinematic aesthetics and symbolic language to foster viewer reflexivity. The study's results corroborated this, demonstrating that conceptual photography not only expands the boundaries of photographic art but also fulfils a socio-critical function, enabling artists to engage with pressing social issues. Furthermore, conceptual photography today increasingly integrates digital technologies, enhancing its expressive potential. Contemporary artists experiment with interactive installations where photography functions within a multimedia environment or employ algorithmic generation to create new imagery, thereby augmenting its critical capacity.

Another crucial aspect of the study was understanding the relationship between photography and cinematography, particularly in the context of staged photography. The research revealed that the works of photographers such as Gregory Crewdson exhibit a direct connection to cinematic visual strategies. This is evident in meticulous scene planning, the use of cinematic lighting, compositional structuring, and even the application of post-production techniques typically employed in the film industry. The findings confirmed that photography borrows cinematic elements such as framing, dramatic lighting, and scene sequencing. This indicates a gradual expansion of photographic art's boundaries, where traditional expressive means are supplemented by cinematic techniques to create complex narrative structures. In this context, staged photography can be regarded as a form of visual storytelling occupying an intermediary position between traditional photography and cinematography.

An additional significant aspect of the study was clarifying the role of minimalist and abstract photography in the contemporary artistic context. An analysis of Andreas Gursky's works confirmed that contemporary photography increasingly gravitates toward abstraction, utilising digital editing tools to create meticulously structured compositions. This reflects a shift away from the traditional understanding of photography as a medium of reality representation, transforming it into a self-sufficient artistic object. The study found that digital post-processing not only influences the technical aspects of photography but also alters its perception, bringing the photographic image closer to painting. This trend opens new possibilities for integrating photography with other media, which is particularly relevant in the context of postmodern art.

An analysis of photography's interaction with emerging technologies revealed that the distribution of photographic art has undergone significant changes with the advent of NFTs. The study found that NFTs create new opportunities for artists in terms of commercialisation and copyright, consistent with the conclusions of M. Beckman (2021). This confirms that photography has become an integral part of the digital art market. However, the research also identified risks associated with this phenomenon: the NFT market is often speculative, casting doubt on the long-term artistic value of such transactions. This trend correlates with the findings of V. von Wachter *et al.* (2022), who emphasised that NFTs may contribute to the devaluation of art due to excessive commercial exploitation of the technology.

Another significant discovery was the identification of social media's influence on the distribution and popularisation of fine art photography. Social platforms such as Instagram facilitate the expansion of photographic art by creating global networks for artists and audiences. This aligns with the research by S.L. Patriocio (2024), which confirmed that social media serves not only as a means of display but also as a mechanism for forming artistic communities. However, the results also revealed that algorithmic mechanisms may negatively impact the creative process, compelling photographers to adapt their works to popularity criteria. This corresponds with the conclusions of G. San Cornelio (2022), who noted that social media often dictates visual trends, which may constrain experimentation in photography. N. Shmarko & N. Grechanyk (2023) emphasised that the development of aesthetic culture requires not only exposure to art but also conscious reflection and emotional engagement – aspects that risk being undermined when visual content is shaped primarily by platform algorithms.

The obtained results hold substantial significance in both theoretical and practical aspects, as they confirm that contemporary fine art photography is a multilayered phenomenon that transcends traditional notions of artistic practice. This study demonstrated that

fine art photography is not merely a medium of artistic reflection but also an active participant in interdisciplinary dialogue with other forms of visual art, including painting, cinema, digital media, and interactive technologies. Thus, the research has not only broadened the understanding of the evolution of photography but also proposed new approaches to its analysis within the context of contemporary aesthetics. Overall, the findings confirm that fine art photography remains a key medium for the aesthetic interpretation of modernity and a response to shifts in visual culture. The evolution of this field continues through integration with modern technologies, enabling the expansion of expressive possibilities and the formation of new conceptual approaches in 21<sup>st</sup>-century art.

## CONCLUSIONS

The study established that fine art photography is an autonomous and multifaceted art form that integrates painterly, cinematographic, and digital techniques while adapting to changes in visual culture. The research confirmed that fine art photography has evolved from the documentary recording of reality to a conceptual medium of artistic expression encompassing a wide spectrum of stylistic approaches. It was determined that the development of fine art photography in the 20<sup>th</sup>-21<sup>st</sup> centuries occurred through the progressive expansion of its aesthetic and technical possibilities. The study revealed that Pictorialism contributed to the recognition of photography as an art form, avant-garde movements of the early 20<sup>th</sup> century laid the foundations for experimentation with form, and digital technologies of the late century transformed its methods of creation and perception. As a result, the research confirmed that contemporary photographers actively combine documentary and conceptual approaches, crafting personal yet universal visual narratives.

The analysis of specific stylistic movements in fine art photography demonstrated that conceptual photography plays a crucial role in shaping social and cultural discourse. The works of representatives of this movement, such as Cindy Sherman, illustrated that photography can be used not only for the aesthetic exploration of form but also as a means of critically analysing societal norms. The study also confirmed that staged photography increasingly approximates cinematographic art, employing complex lighting systems, compositional techniques, and scenography to create visually rich and dramatic imagery. Minimalist photography, in turn, rejects traditional narrative, focusing instead on the interplay of colours, textures, and geometric forms. Ultimately, the research affirmed that fine art photography is a complex and multilayered phenomenon that continuously evolves and adapts to contemporary challenges. The obtained results constitute a significant contribution to the study of photographic art and provide a foundation for further inquiries into

the integration of traditional and digital methods of visual expression.

The study is limited by its chronological framework (20<sup>th</sup>-21<sup>st</sup> centuries), its focus primarily on the works of Western photographers, and its analysis of curatorial strategies in leading museums, which does not fully encompass the global diversity of approaches in fine art photography. Future research prospects include exploring the relationship between fine art photography and virtual and augmented reality, the influence of social media on the formation of visual strategies among contemporary photographers, and the analysis of aesthetic shifts in photographic art under the impact of artificial intelligence. Based on the obtained results, it is recommended to expand research on the influence of digital technologies on the development of fine art

photography, particularly investigating the relationship between traditional and computer-generated imagery. Another promising direction is the analysis of photography within the context of new media and the visual culture of social networks. Further studies may focus on changes in artistic strategies under the influence of algorithmic systems that shape visual trends in digital space.

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## Fine art photography як форма візуального мистецтва: естетика, стилі та сучасні тенденції

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**Анотація.** Дослідження було спрямоване на аналіз fine art photography як форми візуального мистецтва, її естетичних характеристик, стилістичної еволюції та сучасних тенденцій розвитку. Дослідження базувалося на аналізі мистецтвознавчих праць, виставкових каталогів, художніх практик провідних фотографів, а також контент-аналізі цифрових платформ і non-fungible token-ринку. У процесі дослідження було встановлено, що художня фотографія вийшла за межі своєї традиційної документальної функції та набула статусу самостійного концептуального медіума, що інтегрує елементи живопису, кінематографу, перформансу та цифрових технологій. Виявлено, що стилістичні трансформації fine art photography супроводжувалися експериментами з формою, світлом, композицією та наративною структурою, що особливо проявилось у розвитку таких напрямів, як концептуальна, постановочна та мінімалістична фотографія. Результати дослідження підтвердили, що fine art photography перетворилася на багатовимірну художню практику, яка поєднує візуальну естетику з концептуальним змістом та активно взаємодіє з іншими формами мистецтва. Виявлено, що сучасні фотографи не лише експериментують із жанрами та техніками, а й формують нові способи взаємодії з аудиторією через цифрові платформи, non-fungible token-технології та соціальні медіа. Дослідження підтвердило, що цифрові технології відкривають нові можливості для фотографів, зокрема у сфері алгоритмічного редагування, генеративного мистецтва та non-fungible token-економіки, водночас змінюючи способи презентації та взаємодії художників з аудиторією. Отримані результати можуть бути використані в мистецькій освіті, кураторській діяльності та розробці нових форматів цифрової експозиції

**Ключові слова:** пікторіалізм; постмодернізм; невзаємозамінні токени; інтерактивні медіа; культурна ідентичність; концептуальність

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