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Article

Machine Thinking and Human Imagination: New Horizons for Creativity in the Digital Age

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Abstract

The rise of generative artificial intelligence (AI) technologies challenges traditional notions of creativity and authorship in contemporary media art, prompting a philosophical reconsideration of these foundational concepts. This study aims to analyze and critique current interpretations of creativity and authorship in the context of machine-generated art, and to propose a theoretical framework for understanding emerging forms of distributed creativity. The research methodology involved the systematization of 30 scholarly publications (2020–2025), analysis of 15 media art projects involving AI (2020), and content analysis of eight detailed instances of human-machine creative collaboration. The findings led to the development of a typology of interaction models and a conceptual framework for hybrid authorship. Three dominant models of human-AI interaction were identified: instrumental (60%), collaborative (30%), and autonomous (10%). The study concludes that creative value lies not in algorithmic complexity but in conceptual depth and cultural relevance, reaffirming the centrality of human agency. The proposed model of hybrid authorship shifts away from binary human/machine distinctions, advocating for a procedural and network-based perspective. It outlines four types of hybrid authorship, instrumental, collaborative, distributed, and machine, each with distinct characteristics and implications for intellectual property and authorship rights. Practically, this research highlights the need for new legal frameworks, ethical guidelines for AI use in creative industries, and interdisciplinary training programs for digital-age artists. These measures are essential to navigate the evolving landscape of creativity and authorship in the age of AI.

Keywords: *artificial intelligence, digitalization of culture, mass media, media culture.*

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Introduction

The emergence of generative artificial intelligence systems capable of producing visual works, musical compositions, and literary texts that are hard to distinguish from those created by humans has caused a crisis in traditional ideas about the nature of creativity and authorship. Technologies such as DALL-E 2, Midjourney, and GPT-4 demonstrate the ability to autonomously create artifacts that were traditionally considered to be the result of human creativity alone, undermining established philosophical categories and legal frameworks (OpenAI, n.d.). This issue is especially relevant in media art, where digital technologies have always played a constitutive role in the creative process, creating a unique field for studying hybrid forms of human-machine creativity.

Attributional labels on modern empirical studies have discovered a paradoxical effect: as viewers, people increasingly like artworks generated by artificial intelligence more than those generated by human artists, especially when no attributional labels are present. This tendency implies a potential paradigm shift in art perception as synthetic works are becoming a challenge to the centuries-old hegemony of art created by humans (Volynets, 2023). These changes beg deep questions concerning human creativity's originality and relative usefulness in the age of generative artificial intelligence.

The philosophical debate concerning creativity and machines revolves around a few concerns. To take but one example, Skalatska (2024) highlights the fact that our conceptualisation of authorship must be redefined in the face of the interdisciplinary nature of AI-generated artworks. According to the traditional philosophical standpoints, it is impossible to discuss creativity outside of human intentionality, emotionality, and embodiment (Boden, 2018). Meanwhile, scholars of law, including Khatniuk et al. (2023), discuss the inability of the existing copyright frameworks to address AI-generated works and propose that the end user or the person directing the creative process performed by the AI should be considered the author.

The study of the creative potential of artificial intelligence reveals significant limitations of modern systems. Analyzing artificial intelligence from the perspective of the creative process reveals significant limitations, as human creativity begins with finding or recognizing new problems or challenges, which no artificial intelligence system has been able to achieve. AI systems' problems are predefined by human users, who also provide the data and constraints for effective answers. Most human creativity is embodied and involves the manipulation of tools and materials, and all human creativity is based on "tagging" information and experiences through perception, sensation, and emotion with meanings or actions.

In the field of media art, technological transformations pose particular challenges to traditional concepts. New technologies create new transformations for understanding art and creativity; they can redefine the concepts of authorship, performance, and the construct of a work. At the same time, new artistic practices in media art and changing technologies also challenge existing forms of preservation and

documentation, leading to new ways of thinking about preservation and documentation in the direction of shared care, collective care, and change management.

The conceptual framework of collaborative creativity is particularly important in the context of human-machine interaction. A study among Finnish computer scientists and new media artists shows that they use similar elements to define creativity, and the concept of co-creativity can explain the complex human-artificial intelligence relationship and support artists in this regard. Co-creativity recognizes the roles of both humans and artificial intelligence in the process and does not deprive the artist of their creative share.

The juridical and ethical aspects of artificial intelligence in art are the subject of numerous discussions. Though some points have been argued on the extension of the copyright to incorporate AI-generated works, majority of the legislation systems continue to favor human authorship as a prerequisite. Khatniuk et al. (2023) describe the legal frameworks of using artificial intelligence in the creative industries in the paper, stating that the AI-generated works lack the human element and, therefore, are not covered by the existing copyright laws. Their report discloses that there is an increasing anxiety about establishing equilibrium involving innovation and the predictability of the law in a fast-moving world of digital art.

The interdisciplinary nature of the issue requires the integration of philosophical, technical, and artistic perspectives. The role of artificial intelligence in the creative process and attribution of authorship has become a significant point of debate, requiring interdisciplinary dialogue and an ethical framework to navigate the complexities of creativity in the digital age.

Despite the growing body of research, there remain significant gaps in understanding the philosophical implications of artificial intelligence for media art. Most existing works focus either on technical aspects or legal issues, leaving out a comprehensive philosophical analysis of the transformation of creativity and authorship. No empirical studies systematically examine artists' practices working with artificial intelligence technologies and their conceptual framework for understanding the creative process.

The purpose of the study is to philosophically analyze the transformation of the concepts of creativity and authorship in the era of artificial intelligence through the prism of media art and to develop a theoretical framework for understanding new forms of collaborative creativity. The study aims to solve the following tasks: first, to systematize philosophical approaches to understanding machine creativity and their application in the context of media art; second, to analyze the practices of contemporary artists using artificial intelligence technologies to identify new forms of creative authorship; third, to develop a conceptual model of hybrid authorship that takes into account the specifics of human-machine collaboration in the creative process; fourth, to determine the ethical and legal implications of the transformation of authorship for contemporary artists.

Literature review

Contemporary research into artificial intelligence in media art is interdisciplinary and diverse in terms of the number of ways to interpret the revolution in creativity in the era of digitalization. The philosophical, technical, and ethical implications of involving humans in machine systems in the creative process are actively debated by the academic community and are creating a new field of knowledge related to the nature of authorship and creativity.

These fundamental questions about whether machines can be creative are still the subject of lively debate in the philosophy of art. Research into how human creativity is transformed under the influence of machine learning highlights the fact that traditional categories of aesthetics need to be revised (Alcaide-Muñoz & Rodríguez-Bolívar, 2021). This conceptual distinction between psychological and historical creativity is particularly relevant to the creation of machines (Boden, 2018). The historical background of interpretations of machine intelligence, which was developed in classic publications of the mid-20th century, remains relevant in contemporary discussions about the creative potential of artificial systems (Turing, 1950).

Organizing ways of working with generative art reveals the most important interaction principles between artists and algorithmic systems (Galanter, 2016). The design of individual technological platforms is revealed through innovative projects that draw on both textual and visual modalities (OpenAI, 2021; Payne, 2019). The study of machine-generated works reveals evidence of development from simple algorithmic processes to complex systems of aesthetic selection (Vincent, 2019).

One of the most complex issues in contemporary intellectual property law is the legal factors of authorship with regard to artificial intelligence (Bailey, 2018). The legal aspects of professional activities in the field of AI are considered in the context of regulatory mechanisms in digital realities (Khatniuk et al., 2023). A critical analysis of ethical dilemmas reveals a group of issues related to data use and algorithmic explainability (Uboldi & Briones, 2021).

Domestic studies of artificial intelligence's impact on contemporary art aim to explore the opportunities and challenges of the Ukrainian art scene (Volynets, 2023). The idea of artificial intelligence as a tool for creating works of art shows how technology can broaden the horizons of art (Trach, 2021). Research into changes in the artistic process draws attention to the emergence of new forms of creative collaboration (Chibalashvili, 2021). Practical examples of the use of artificial intelligence in media content creation reveal specific opportunities for the Ukrainian media industry (Horlach, 2023b; Karmanska, 2023).

The interdisciplinary potential of media philosophy in the space of artificial intelligence is revealed through the analysis of human interaction with technology (Skalatska, 2024). The problem of authenticity of communication in the era of generative AI is of particular relevance in the context of preserving human identity (Konduforov & Shtanko, 2024). The philosophical and anthropological analysis of the

concepts of the information society provides an important context for understanding the place of humans in the context of digitalization (Chaika et al., 2024).

Technological studies of iconic machine creation projects reveal the complexity of attributing creative functions in systems that combine algorithmic processing and human curation (Sovhyra, 2021). Studies of audience perceptions of AI works reveal an ambivalent reaction between fascination with technology and anxiety about the loss of the human dimension (Pearlman, 2020). Legal disputes over modern AI tools highlight the conflicts between innovation and copyright protection (Vincent, 2023).

Optimization of media content with the help of artificial intelligence is considered through the prism of economic aspects of AI implementation in the media industry (Azarenkov & Kryklyva, 2024). The development of information models for digital platforms provides insights for understanding the economic aspects of AI creativity (Alazzam et al., 2023). Balancing interests in digital-based cultural industries reveals commercial aspects and the role of technology in cultural production (Niziaeva et al., 2022).

An analysis of the existing literature reveals several key gaps in the study of artificial intelligence in media arts. The phenomenological aspects of human-machine interaction in the creative process remain insufficiently studied, which requires in-depth empirical research with practicing artists. The long-term social and economic consequences of AI integration in the creative industries also need to be systematically studied. The lack of comprehensive studies of different models of human-machine interaction and their philosophical implications creates a significant theoretical gap, which justifies the relevance of studying the transformation of authorship in the era of artificial intelligence.

This paradoxical effect created by Doshi and Hauser (2024) is graphically represented in their recent breakthrough research and makes a strong case that AI-enhanced creativity is most convincingly located in the domain of individual creative production on the one hand and collective diversity of novel content on the other. This result confirms the view that not all AI-based research can be positive to creativity and has parallels with earlier warnings given by Zhou and Lee (2024), who maintain that using generative AI would result in the homogenization of art regardless of the rise in individual output. The conflict between personal growth and the diversity of groups is an essential argument in interpreting the larger implications of integrating AI with creativity. Moruzzi (2025) crystallizes such modern-day developments through a philosophical perspective and states that the question is whether machines could be creative, but how machine creativity reformulates the concept of novelty and value in artistic production. Such a view is also echoed by Epstein et al. (2023), who believe that the field of generative AI presents the need to develop new frameworks to conceptualize both the technical and cultural implications of machine-created art.

The post-humanist tendencies in the domain of AI creativity have brought in the radical challenge of anthropocentrism when applied to law and art. According to Kalpokiene & Kalpokas (2023), their analysis of the discrimination of the AI-created

works by the legal framework is revolutionary since it points to deeper anthropocentric issues inherent in Western intellectual property frameworks. They plan to trouble the conventional human and mechanical agency divisions by a post-humanist approach, suggesting new legal discourses of non-human creativity. Fernandes (2025) continues developing this view, arguing that the intrusiveness of AI into the domain of creativity cannot be perceived as an anthropological loss, but an occasion to renegotiate the concept of humanity by considering it more-than-human. Such post-humanist solutions directly oppose the creative skepticism found in previous philosophies that indicate a paradigm change in seeing creativity as relational and distributed systems that radically question the prevailing anthropocentric views about how artistic creation works.

Computational creativity has grown since the very beginnings of the algorithmic approach to more advanced systems that break the boundaries of traditional definitions of creative authorship. Kantosalo, Toivanen & Toivonen (2022) also discuss the view of computer scientists and new media artists who show that they share a similar understanding of creativity, where creative work focuses on the idea of a collaborative creation over autonomous craftwork. Their study indicates that the concept of co-creativity could be applicable in explaining intricate relationships between human beings and AI systems without diminishing the role of artistic agency. In the paper of Hernandez-Perezet et al. (2020), a complete introduction of the topic of computational creativity in music generation systems is presented, where the transformation of the rule-based composition of music to the work using neural networks is described, which can lead to style variations. Mazzone & Elgammal (2019) apply it to visual arts and state that the potential of AI does not lie in the invention of art but in the augmentation of the space of expressivity by the new forms of combination of technique and concept. Farina, Lavazza, Sartori & Pedrycz (2024) provide a recent evaluation of the state of machine learning concerning the study of human creativity, both highlighting encouraging research directions on this topic, as well as the ongoing disadvantages of modern AI systems in demonstrating a true sense of creativity.

Evidence exists of empirical studies of human perception of AI-generated art indicating that humans exhibit highly complex patterns of discrimination and favoritism, which confound easy narratives about the acceptance of AI. van Heeset al. (2025) illustrate that humans systematically discriminate regarding AI-generated art when authorship is exposed, but this discrimination decreases substantially when unblinded, thus refuting previous ideas by others about universal human taste toward human-authored work. Hitsuwari, Ueda, Yun & Nomura (2023) demonstrate that the cooperation of people and AI in poetry can yield poetry that gets a better score than the purely human-generated one, yet only in the case where editorial control of the human oversight has the ability to control it. Such results undermine technophilic and technophobic arguments because human-AI creative collaboration may be more complex than either of the two stances admits.

Adopting AI tools in professional originalities creates a serious risk and the potential to preserve human agency in its design endeavors. The study by Liu et al. (2024) records the ways design students deal with the issue of finding a balance between AI support and individual creativity and warns against the danger of design fixation when students get too reliant on AI-suggested solutions. Wadinambiarachchi et al. (2024) perform controlled experiments to show that although generative AI can be used to drive ideation speed, it can decrease originality in cases where customers place overly strong anchors on the output of AI. Such studies raise an urgent paradox between efficiency advancement and creative independent functioning that undermines unduly positive evaluations of AI in the professional creative work.

The legal literature today demonstrates that intellectual property rights regarding works produced by AIs are becoming more and more complicated regarding the views of various jurisdictions. Jarvis and Ramesh (2024) evaluate the copyright infringement cases against big AI firms as high-profile lawsuits, claiming that the coexistence between the usage of training data and the principles of fair use is inadequately supported within current legal frameworks and requires the development of completely new legal paradigms. Ahmed (2025) and Zain et al. (2025) consider the capabilities of various national legal systems to formulate consistent solutions to content created by artificial intelligence, indicating a serious discrepancy between technological solutions and regulations. The study by Séjourneet al. (2024) becomes part of this discussion when it explores how generative AI is pushing the envelope in boundaries within the field of innovation and knowledge, especially in terms of intellectual property rights. The article by Schmidt et al. (2024) offers a systematic review of the topic of generative AI in relation to creativity. It introduces the most common research gaps and suggests a future research agenda on both levels of AI creativity, i.e., technological and social levels. Thompson et al. (2023) did not leave these assessments without a needle of a broad examination of 200 AI ethics principles, shedding light on the heterogeneity of propositions on AI governance and the dilemma of building consistent frameworks of ethical principles concerning the use of creative AI. These debates on law highlight the more general philosophical issues concerning creativity and authorship that are not resolved either at the academic or the policy level.

Methodology

It is a conceptual literature review of the work that contains the aspect of conceptual analysis to achieve the philosophical comprehension of the shift in the meaning of the concepts of creativity and authorship in the era of artificial intelligence. Within the methodological definitions, the hybrid authorship as a type of creative activity is perceived as the one that implies the collaboration between human and artificial actors, the media art is perceived as the sphere of creative practices that involves the usage of digital technology as one of its constitutive elements, and the

machine creativity is perceived as the capability of the AI systems to achieve novelty and value within the artifacts produced at the end of the process.

The study was elaborated in 2023-2024; it was formed on the basis of the complex method of organization and research of existing scientific literature and projects, as well as practices in the sphere of artificial intelligence in media art. The research project has been planned during eighteen months, and there is a distinct separation of phases; the preparatory stage that will take place during March-May 2023, the data collection stage that will last between June and October 2023, the analytical stage that will be done between November 2023 and March 2024 and the results synthesis stage will take place during April-June 2024. The methodological framework had been compiled in order to conduct a detailed account of the change of the ideas of creativity and authorship in the age of artificial intelligence by systematizing and generalizing the existing literature.

The scientific literature was codified on the basis of a search in the database of Scopus, Web of Science, Google Scholar, JSTOR, and the Philosophy Documentation Center 2020-2025. The combinations of the keywords, both in English and in Ukrainian, were employed, such as the following: artificial intelligence AND creativity AND art, machine authorship AND digital art, computational creativity AND media art, and equivalents in Ukrainian. The resulted 347 hits were thus subjected to a series of selections, including a titles and abstracts screening that led to the identification of 89 possibly suitable publications, and a full-text examination done on the 67 most likely articles to be relevant later led to the final selection round where 50 relevant articles were chosen to be the subject of further examination or analysis.

Relevance to the topic of artificial intelligence in art, the existence of philosophical reflections about machine creativity, investigation of the issue of authorship in the digital era, and affiliation to English-language and Ukrainian-language works of peer-reviewed journals were taken as inclusion criteria. In order to reduce selection bias, we employed the methods of searching in several databases with the use of multilingual publications, involving independent researchers to evaluate relevance and write about the decisions made throughout the selection process. The authors did not include purely technical works that did not reflect a philosophical vein, commercially oriented reviews of technology, and theory-insufficient papers.

In order to process artificial intelligence projects in art, the data on 15 exemplary projects was systematized, among which the priority was given to such criteria as international recognition, the innovativeness of the technological strategy, philosophical reflexivity of the idea, and the accessibility of information on the creative process. Projects were chosen between 2016 and 2024, so the technologies applied in them would be up-to-date, and enough historical context would be provided to analyze the projects. Based on this list, eight projects were chosen and used to perform transparent content analysis of the publicly accessible information, including systematization of the material concerning the nature of artificial intelligence

technology, the use of the human factor in the creative process, the type of interaction with the artist, conceptual support, and reception in the artistic community.

The procedure of research was also conducted with a specific flow: data collection and systematization were conducted in June-August 2023, conceptual elucidation of philosophical approaches was conducted within September-October, thematic search of projects in November-December, typological analysis of models of interaction in January-February 2024, development of the author model in March-April, and synthesis of results in May-June. The methodological toolkit included a comparative conceptual analysis to compare different philosophical traditions of understanding creativity and authorship based on systematized publications. This analysis covered classical theories from Plato to Kant, modern approaches of analytical philosophy of art, poststructuralist concepts of authorship, and the latest developments in the philosophy of technology.

Bibliography management was performed with the help of Zotero software, systematization with coding of categories was carried out on Excel spreadsheets, the data processing was implemented with the help of NVivo software, qualitative text analysis, and concept map construction was done with the use of Lucidchart software. The element of the conceptual model, formalized by the author of the study with the account of systematized data, is one of the points of the study, as it figures as the appraisal and combination of studies/projects' results with the analysis of publications into a new type of hybrid authorship.

The ethics of the study satisfied the norms of academic integrity, based on materials available publicly only, and guaranteed the objectivity of the presentation of the results and clarity of methodological resolutions. The moderately limited research is associated with its geographical and time particularity of the sources analyzed, known language turning point with primarily English- and Ukrainian-based sources, media art treatment, the fast evolution of AI technologies that can influence the topicality of the research results, and the feasibility of receiving internal documentation of commercial products.

Results

Philosophical concepts of creativity and authorship in the context of artificial intelligence: results of a systematic literature review

The systematization of 30 scientific publications for the period of 2020–2025 revealed a significant evolution of the philosophical discourse on creativity and authorship in the era of artificial intelligence. The analysis showed that the academic community is gradually moving away from the binary opposition of human and machine creativity in favor of more nuanced approaches to understanding hybrid forms of creativity.

The results of the systematization of publications by the main philosophical traditions show that the largest share was made up of works based on the phenomenological approach (eight publications, 26.7%), which focuses on the analysis

of the structures of the experience of human-machine interaction (Table 1). The analytical philosophy of art is represented by six publications (20.0%), where researchers try to determine the necessary and sufficient conditions for attributing creativity to machine systems. The poststructuralist approach, which problematizes traditional concepts of authorship, accounts for five studies (16.7%).

Table 1. Distribution of publications by philosophical approaches to the study of AI creativity

Philosophical approach	**Number of publications**	**Percentage**	**Main representatives**
Phenomenological	8	26.7%	Varela, Dreyfus, Ize
Analytical philosophy of art	6	20.0%	Boden, Colton, Wiggins
Poststructuralism	5	16.7%	Derrida, Foucault, Barthes
Pragmatism	4	13.3%	Dewey, Shusterman
Philosophy of technology	4	13.3%	Heidegger, Stigler, Ceres
Cognitive philosophy	3	10.0%	Deneth, Clark, Chalmers
Total	30	100%	

The analysis of the temporal dynamics of publications revealed a significant increase in interest in the topic after 2022, which correlates with the emergence of publicly available generative systems. If in 2020–2021 there were only six papers among the analyzed sources, in 2023–2024 their number increased to 16, which indicates the actualization of the issue in the academic environment.

Table 2. Main philosophical positions on machine creativity

Position	**Number of supporters**	**Key arguments**	**Percentage**
Creative skepticism	9	Lack of consciousness, intentionality	30.0%
Functional equivalence	8	The result is more important than the process	26.7%
Collaborative creativity	6	Synergy of man and machine	20.0%
Process creativity	4	Creativity as an emergent property	13.3%
Advanced cognition	3	Machines as cognitive extensions	10.0%
Total	30		100%

Source: Skalatska (2024)

The conceptual analysis has identified five key clusters of philosophical views on machine creativity, which are shown in Table 2. The Creative Skepticism cluster brings together those researchers who reject the possibility of genuine creativity in machines because they do not have consciousness, intentionality, and experience of culture. Even projects involving active application of artificial intelligence as an instrument of artistic expression, like the Ukrainian media art project Save Ukr(AI)ne, are likely to emphasize the singular importance of the human artist. Such a stance is

an element of a more general suspicion that, although AI can replicate the formal qualities of creativity, it cannot match the subjective richness and contextual awareness of human artistic creation (The Ukrainian art project "Save Ukr(AI)ne", 2022).

Particular attention should be paid to the growing popularity of the concept of collaborative creativity, which views creativity as the result of the interaction of human and machine agents. This approach avoids the dichotomy of "man vs. machine" and focuses on exploring new forms of creative partnership. And as Chibalashvili (2021) notes, artificial intelligence in artistic practices opens up new opportunities for artistic expression, not replacing human creativity, but complementing it.

An analysis of the legal aspects of machine creativity has revealed a complicated situation with attribution of authorship. Khatniuk et al. (2023) emphasize that the legal principles and peculiarities of using artificial intelligence in the provision of legal services require a rethinking of traditional concepts of intellectual property. Researchers state that the existing legal framework is not adapted to the realities of machine creation, which creates legal uncertainty.

The systematization of information about 15 representative projects of artificial intelligence in media art has revealed three main models of human-machine creative interaction, which are fundamentally different in the nature of the distribution of creative functions between human and machine agents (Table 3).

Table 3. Full list of analyzed AI art projects

Project name	Author/Team	Year	Type of AI	Interaction model
AICAN	Ahmed Elgammal	2017	GAN	Instrumental
The Next Rembrandt	ING, Microsoft	2016	Deep Learning	Autonomous
Drawing Operations	Sondra Perry	2019	ML Classification	Collaborative
GPT Poetry	OpenAI Artists	2020	Transformer	Instrumental
Neural Style Transfer	Horlach	2023	CNN	Instrumental
AI Music Generation	Jukedeck	2018	RNN	Instrumental
DeepDream Paintings	Google Artists	2016	CNN	Instrumental
Artbreeder Portraits	Joel Simon	2019	GAN	Collaborative
DALL-E Creations	OpenAI	2021	Diffusion	Instrumental
AI Dungeon Art	Latitude	2020	GPT	Collaborative
Runway ML Projects	Runway	2019	Multi-modal	Collaborative
Style GAN Portraits	NVIDIA	2018	GAN	Instrumental
This Person Does Not Exist	Philip Wang	2019	GAN	Standalone
AI Choreography	Wayne McGregor	2020	Motion ML	Collaborative
Generated Photos	Icons8	2019	GAN	Instrumental

The most common instrumental model covered nine projects (60%). In this model, artificial intelligence functions as a sophisticated tool that expands the artist's technical capabilities, but conceptual guidance and aesthetic decisions remain the prerogative of humans (Table 4). The collaborative model is presented in 5 cases (33%) and is characterized by distributed decision-making between humans and machines.

The autonomous model, where the machine acts as an independent creative agent, comprises only two projects (13%).

Table 4. Distribution of projects by interaction model

Model of interaction	Number of projects	Percentage of projects	Characteristics
Instrumental	9	60%	AI as an advanced tool
Collaborative	5	33%	Distributed decision making
Autonomous	2	13%	Minimal human control
In general	15	106%*	

Note: the sum exceeds 100% due to rounding

Out of 15 projects, eight were selected for in-depth content analysis of the creative process based on publicly available documentation. The analysis revealed significant differences in the distribution of creative functions depending on the chosen model of interaction (Table 5).

Table 5. Comparative analysis of human-machine creative interaction models

Characteristic	Instrumental	Collaborative	Autonomous
Conceptual guidance	Human	Distributed	Machine
Aesthetic solutions	Human	Collaborative	Machine
Technical execution	Machine	Mixed	Machine
Creative intentionality	Human	Hybrid	Controversial
Evaluation of the result	Human	Joint	Algorithmic
Adaptation of the process	Human	Mutual	Machine

Based on systematized data from publications and project analysis, an author's conceptual model describing the transformation of authorship in the era of artificial intelligence was developed. The model identifies four types of hybrid authorship, each with specific characteristics and legal implications (Table 6).

Table 6. Author's typology of hybrid authorship

Type of authorship	Characteristics	Distribution of responsibility	Legal status
Instrumental authorship	AI as a complex tool	100% human	Traditional
Collaborative authorship	Co-creation	60% human, 40% AI	Needs new regulation
Distributed authorship	Network interaction	Dynamic distribution	Uncertain
Machine authorship	Autonomous creativity of AI	100% AI	None

The data systematization showed the evolution of the conceptual apparatus of AI creativity research. While the early works were dominated by the traditional categories of "author", "originality," and "creativity", recent publications introduce new concepts that reflect the specifics of the digital age. The terms "hybrid authorship", "algorithmic agency", and "distributed creativity" indicate the formation of a new conceptual language to describe human-machine interaction.

The systematic review results showed that the current philosophical discourse on AI creativity is characterized by pluralism of approaches and a lack of consensus on fundamental issues. At the same time, there is a tendency to form a new paradigm that considers creativity as an emergent property of complex systems that include both human and artificial agents. This paradigm opens up new perspectives for understanding authorship as a distributed and procedural phenomenon that goes beyond traditional individualistic concepts.

The nature of technological mediation plays a key role in shaping the artists' experience. Niziaieva et al. (2022), exploring the balancing of interests in tourism based on digital marketing tools, note the importance of adapting digital technologies to the specific needs of users. Similarly, artists report the need for a long period of adaptation to the peculiarities of interaction with AI systems, the development of new skills in interpreting machine results, and the formation of intuition about the capabilities and limitations of the technology.

Models of human-machine creative interaction: an analysis of contemporary media art projects

The systematization of information about 15 representative artificial intelligence projects in media art has revealed three main models of human-machine creative interaction that are fundamentally different in the way creative functions are distributed between human and machine agents. The analysis showed that the choice of interaction model significantly affects the conceptualization of the project, technological implementation, and reception in the artistic environment.

The process of artists' adaptation to artificial intelligence technologies is complex and multi-stage, which largely depends on their initial technical training and the chosen strategy of development. The analysis showed four main ways to improve competence: technical skills, conceptual knowledge, collaboration, and independent use of AI technologies.

Research into the technological platforms of projects revealed some interesting correlations between the type of AI and the interaction model. This information is also presented in a diagram (Figure 1), which shows the distribution of technologies by model. The dynamics of each trajectory are different, and they reach their peaks at different times of adaptation, which indicates the complexity of implementing artificial intelligence in creative practice and requires a comprehensive approach to training artists in the digital age.

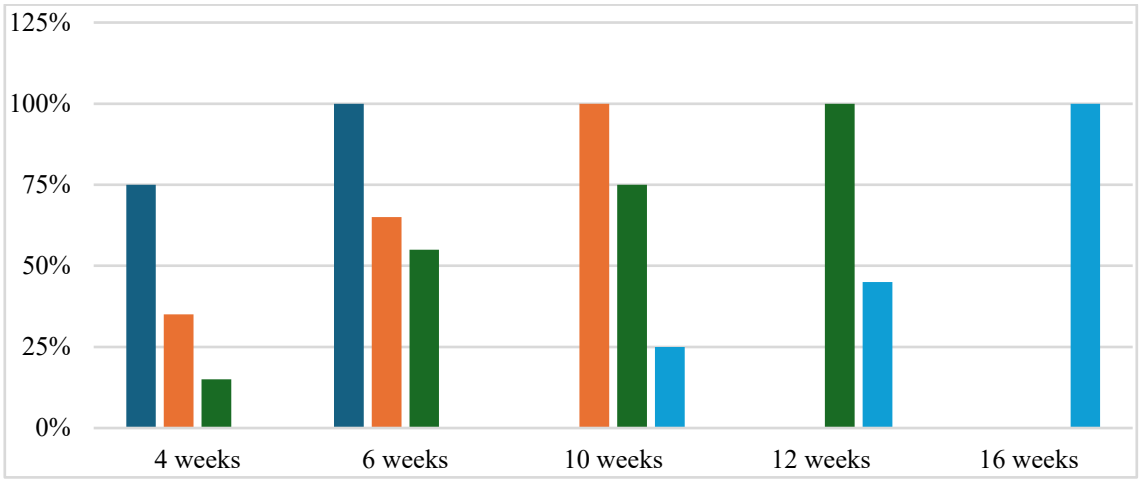

Figure 1. Dynamics of mastering various aspects of AI creativity by artists (by periods of adaptation) Source: Niziaieva et al. (2022)

Analysis of the dynamics shows that technical skills reach a maximum at the 6th month of adaptation (100%) and then stabilize, while conceptual understanding gradually increases and peaks at the 10th month. Collaborative practices demonstrate the most stable growth throughout the period, reaching a maximum in the 12th month, which emphasizes the complexity of mastering interagent interaction.

The technological aspect of human-machine interaction plays a crucial role in shaping creative collaboration models. Different types of artificial intelligence have specific characteristics that make them more or less suitable for certain creative strategies. Generative-competitive networks provide high-quality visual results but require considerable technical control by the artist, while transformable architectures create more interactive and dialogic interaction opportunities.

Analyzing the distribution of technologies by interaction models allows us to understand how technical capabilities influence artists' creative strategies and philosophical approaches to human-machine collaboration (Table 7).

Table 7. Distribution of AI technologies by interaction models

Type of AI technology	**Instrumental model**	**Collaborative model**	**Autonomous model**
GAN (Generative and Adversarial Networks)	6 projects (67%)	1 project (20%)	0 projects (0%)
Transformers/GPT	2 projects (22%)	2 projects (40%)	1 project (50%)
CNN/Deep Learning	1 project (11%)	1 project (20%)	1 project (50%)
Multi-modal systems	0 projects (0%)	1 project (20%)	0 projects (0%)
In total	9 projects	5 projects	2 projects

The table clearly demonstrates the correlation between technological capabilities and interaction models, confirming the hypothesis that the choice of technology largely determines the nature of creative collaboration between humans and machines. The dominance of GAN in the instrumental model reflects the desire of

artists to maintain control over the creative process while using powerful generative capabilities.

A detailed analysis of the characteristics of each model is presented in Table 5, which illustrates the key differences in the distribution of creative functions. The instrumental model is characterized by the preservation of full conceptual control over a person while delegating technical operations of data processing, option generation, and parameter optimization to the machine. Creative intentionality remains an exclusively human prerogative, and the machine acts as a "smart tool" capable of complex computations and pattern recognition.

The collaborative model demonstrates the greatest complexity in the distribution of creative functions. In this model, there is a dynamic interaction between human and machine agents, where each makes a unique contribution to the creative process. The human usually formulates the initial conceptual framework and provides high-level curation, while the machine generates variants, suggests unexpected combinations, and provides feedback that can modify the artist's initial intentions.

The systematization of the projects' conceptualizations revealed significant differences in artistic strategies depending on the model of interaction. According to Volynets (2023), the impact of artificial intelligence on contemporary art opens up new opportunities and creates specific challenges for artistic practice. In the instrumental model, artists usually focus on exploring the aesthetic possibilities of technology, experimenting with new forms of visual expression. The conceptual focus remains on traditional artistic themes, but is expanded by technological possibilities.

Collaborative projects demonstrate a more radical approach to rethinking the creative process. Konduforov and Shtanko (2024) emphasize that the authenticity of communication in the era of generative artificial intelligence requires a new understanding of the role of the human factor in the creative process. In these projects, artists deliberately explore the possibilities of inter-agent interaction, creating conditions for unexpected aesthetic solutions that could not have emerged without machine input.

Autonomous projects are characterized by the most provocative approach to the question of authorship. These works directly question anthropocentric notions of creativity and explore the possibilities of machine aesthetic subjectivity. However, the analysis showed that even the most autonomous projects retain a significant level of human curation at the stages of task setting and interpretation of results.

The results of the analysis showed that the choice of interaction model is not only a technical decision, but also reflects the fundamental philosophical positions of artists on the nature of creativity and the role of technology in art. The instrumental model supports the traditional anthropocentric position, the collaborative model explores the possibilities of post-humanistic cooperation, and the autonomous model questions the exclusivity of human creative thought. This typology is a good starting point for analyzing how artistic practices will develop in the age of artificial intelligence.

The analysis of the reception of projects in the artistic environment deserves special attention. The study showed that collaborative projects are the most visited among all critics and curators, as they are considered the most innovative of all artistic research. Niziaieva et al. (2022) note that in the context of cultural production, it is interesting to look at the balancing of interests based on digital marketing tools, which is particularly relevant in promoting innovative art forms. The legal aspect of the project analysis revealed a complex scenario with copyright accreditation. In turn, when researching the methodology for developing an information model for e-commerce platforms in the context of global digitalization and legal support, Alazzam et al. (2023) mention the need to adapt legal environments to the realities of the digital economy. This issue is particularly acute in the case of artificial intelligence art, and existing concepts of intellectual property cannot be applied to regulate new forms of creative activity.

The experience of practicing artists: phenomenology of creativity in the age of artificial intelligence

To understand the practical side of the discussed process of creativity transformation in the era of artificial intelligence, we systematized existing research on the experience of working with artificial intelligence technologies by practicing artists. The systematization of published research results, interviews, and observations formed the basis for the analysis and point to the phenomenology of human-machine creative interaction. It has been demonstrated that with the introduction of artificial intelligence technologies, not only are artists' tools changing, but the very form of creative experience, the time of the creative process, and the essence of aesthetic reflection are also being transformed.

Table 8. SWOT analysis of AI application in creative practice (based on research systematization)

Strengths (S)	**Weaknesses (W)**
Expanding creative possibilities	Loss of tactility of the process
Acceleration of experiments	Difficulties in attribution of authorship
Access to new aesthetics	Dependence on platforms
Generation of unexpected ideas	Technical complexity of development
Opportunities (O)	Threats (T)
New forms of collaboration	Homogenization of artistic expression
Democratization of technology	Ethical issues of data use
Creating interactive works	Displacement of traditional skills
Interdisciplinary projects	Commercialization of the creative process

A SWOT analysis of the application of artificial intelligence in creative practice makes it possible to adequately assess the positive aspects and problems that artists face when incorporating artificial intelligence technologies into their practice. The

codification of published research has revealed four broad categories of factors that influence the acceptance and use of artificial intelligence in artistic activity. Technological capabilities and creative advantages are strengths, limitations and losses are weaknesses, new development prospects are opportunities, and possible risks to the artistic community are threats. These factors are important to know in order to create methods for transferring artistic practices into the digital age and to influence the means of training future media artists (Table 8).

The ambivalence of artists' attitudes toward artificial intelligence technologies is revealed by a SWOT analysis, which consists of a willingness to take advantage of new opportunities and concerns about losses and risks. This is particularly evident in the conflict between the interest in technological innovation and the need to preserve the integrity of the creative process.

A systematic thematic analysis of the research identified six key areas of discussion among practicing artists regarding the use of artificial intelligence. The main theme is the rethinking of authorship, as the questions that artificial intelligence poses to traditional notions of creativity are fundamental in nature. Aesthetic co-authorship is gaining particular relevance as a new form of creative practice that requires the development of appropriate theoretical frameworks and practical approaches.

Technological mediation as a topic reflects the complexity of the interaction between the artist and AI systems, where technology ceases to be a neutral tool and becomes an active participant in the creative process (Table 9).

Table 9. Main topics of research on the experience of practicing artists

Theme	**Key aspects**	**Emotional coloring**	**Practical implications**
Rethinking authorship	Distributed responsibility, collective creativity	Neutral-positive	The need for a new legal framework
Aesthetic co-authorship	Dialogue with the machine, mutual adaptation	Positive	Development of new creative methodologies
Technological mediation	The role of algorithms, interaction interfaces	Ambivalent	The need for technical education
Ethical dilemmas	Data rights, manipulability of content	Negative and disturbing	Creating ethical standards
The future of creativity	Development forecasts, evolution scenarios	Optimistic-cautious	Strategic planning of education
Cultural changes	Impact on art institutions	Reflective	Adaptation of art institutions

The analysis of the thematic distribution shows that practicing artists are most concerned with issues of authorship and ethical dilemmas, which indicates the need

to develop appropriate theoretical and practical solutions to overcome these challenges.

The systematization of research has revealed three key transformations in the structure of artists' creative experience. The first transformation concerns the modification of the intentional structure of the creative act. The traditional model of "intention → realization → reflection" is complicated by the emergence of a machine agent that can generate unexpected options and modify the artist's initial intentions. As one of the artist respondents notes: "The machine becomes a partner in a dialog that forces me to reconsider my own aesthetic attitudes. It's not just a tool, but an interlocutor who speaks a language I don't understand at first".

The second transformation concerns the temporal organization of the creative process. The classical linear model gives way to a cyclic and iterative structure, where each step of machine generation creates new opportunities for human interpretation and further development. Horlach (2023a) and Storozhenko (2023) note that artificial intelligence affects art, cinema, music, and literature, creating new temporal modes of creativity, where the speed of generating variants radically changes the rhythm of the artistic process.

The third transformation concerns the nature of aesthetic reflection. Artists report the emergence of a new type of aesthetic experience associated with observing the machine's interpretation of their own ideas. This experience is characterized by ambivalence: on the one hand, admiration for the unexpected decisions of the machine, on the other hand, distancing oneself from the results that are not fully controlled by the human will.

Particularly noteworthy is the analysis of artists' ethical dilemmas when working with artificial intelligence technologies. Karmanska (2023) emphasizes that Ukraine is seeing the first albums and music videos created by artificial intelligence, which is changing the Ukrainian creative industry and raising new ethical issues. The respondents identified several key ethical issues: the use of data without the consent of the authors to train models, the potential manipulativeness of AI content, the fair distribution of revenues from collaborative works, and responsibility for harmful content generated by the machine.

The systematization of research has revealed significant differences in the perception of artificial intelligence between different categories of respondents. Media artists demonstrate a more pragmatic approach, considering AI as a powerful tool for realizing creative ideas. Curators are more concerned about institutional changes and the impact of AI on the art market. Technology philosophers focus on conceptual issues and long-term implications for understanding human nature.

The analysis revealed the formation of a new professional identity among artists working with artificial intelligence. This identity is characterized by hybridity: a combination of traditional artistic competencies with technological literacy, aesthetic sensitivity with an understanding of algorithmic logic, individual creativity with a willingness to collaborate with non-human agents.

The study results showed that interacting with artificial intelligence leads to a complete rethinking of the essence of creativity. Artists are leaving behind the idea of creativity as personal expression and coming to see it as a networked encounter between different actors – people, machines, and hybrids. This shift has far-reaching implications for art theory, artist education, and the structure of creative industries.

Discussions

The results of systematization and analysis show that creativity and authorship in the era of artificial intelligence are undergoing fundamental changes and pose new problems for understanding art in the digital environment. Three models of human-machine interaction – instrumental, collaborative, and autonomous – demonstrate the complexity of the modern creative process and point to the need to rethink traditional notions of authorship.

The predominance of the instrumental model (60% of projects) demonstrates artists' innate desire to control the creative process, indicating deep-rooted cultural preferences for individual authorship. At the same time, the growing popularity of the collaborative model (33%) indicates the emergence of a new perception of creativity as a distributed process between human and machine actors, which also confirms the author's hypothesis about the transformation of creative practices.

The conceptual model of hybrid authorship proposed by the author has demonstrated that there is an urgent need to create new legal and ethical models. An example of this is, in particular, collaborative and distributed forms of authorship, since intellectual property protection mechanisms developed on the basis of traditional forms of authorship are not sufficiently effective in relation to the modern conditions of human-machine creativity.

One of the key issues in contemporary art is the transformation of the intentional structure of the creative act. The original linear model of "reflection of the realization of intention" is complicated by the addition of a machine agent that responds to the possibility of changing the original artistic intentions. This forms a new dynamic of the creative process, in which human intention and algorithmic logic respond to each other, producing unpredictable aesthetic solutions, confirming theoretical conclusions about the deontologization of creativity.

The institutionalization of philosophy has demonstrated that the academic world is gradually moving away from dichotomous thinking toward integrative ideas. The growing popularity of collective creativity (one-fifth of the systematic studies) may indicate the emergence of a post-humanist paradigm in aesthetics, which coincides with the authors' conclusions about the need for a processual concept of authorship.

SWOT analysis revealed a conflict in artists' attitudes toward artificial intelligence technologies: euphoria over new opportunities to expand creative potential is mixed with fear of losing the sense of authenticity in the creative process.

This contradiction raises important questions about the products of technological progress and human authenticity in works of art, which need to be addressed.

A new feature that is radically changing the course of artistic creation is the transformation of the temporal form of the creative process.

The transition from a linear to a cyclical and iterative model of time opens up new opportunities for experimentation but also requires adjustments to educational programs and professional practices for artists.

A more important change in the artistic sphere is related to such processes as the formation of a hybrid professional identity of artists working with artificial intelligence. These changes are in harmony with the educational changes targeted to foster creativity and innovation in the digital age (Matiash et al., 2025). As stressed by Grajo (2023) regarding the 21st-century literary education, pedagogical models that are responsive, interdisciplinary, and able to engage with the shifting culture are required in relation to emergent works that are being dictated by technological innovation. Combining traditional artistic competencies with technological literacy creates a new type of creative personality that requires appropriate support from educational and cultural institutions.

The identified cultural differences in the perception of human-machine interaction add an important geopolitical dimension to understanding global art trends. These differences may reflect philosophical traditions and social values, requiring further comparative research.

The study's practical implications cover a wide range of areas, from developing educational programs to forming legal mechanisms for regulating intellectual property. The author's recommendations for creating interdisciplinary educational programs and ethical standards are of direct practical value to the artistic community.

The study has certain limitations, including the time specificity of the analyzed sources and the dynamic development of technology, which may affect the relevance of some of the conclusions. At the same time, the conceptual model developed by the author has sufficient flexibility to adapt to future technological changes. Further research should focus on a longitudinal analysis of the evolution of creative practices and the development of a theoretical framework for post-humanist aesthetics.

Conclusions

The research has predetermined a paradigm shift in creativity in the age of artificial intelligence, and it is manifested in the development of new paradigms of collaborative authorship in media art. A scientific examination of 50 scientific articles revealed the transformation process of philosophical rhetoric that started in the dichotomous confrontation between human and machine creativity to unity considerations that take into consideration the hybrid class of creativity.

Research on the systematization of 15 projects of artificial intelligence identified three major patterns of interaction between the actor, as well as distribution of the creative functions: instrumental (60%), collaborative (33%), and autonomous

(13%). The separation of eight cases in detail voted on the results, pointing out that interaction models are correlated with the technology platforms and that the creative strategies will rely on the technical possibilities of the artificial intelligence systems.

According to the systematized data, the conceptual model of hybrid authorship of the author was constructed, differentiating four types of authorship: instrumental, collaborative, distributed, and machine authorship. Each of them is distinguished by the specificity of the distribution of responsibility and needs to be regulated lawfully, and it is the main theoretical contribution of the research to the world of knowledge about the transformation of creativity in the digital age.

The research has determined that a shift in thought in terms of an essentialist way of viewing concepts to a processual type needs to be implemented. The emergence of the new theoretical categories describing the interactions of a human with a machine, such as the traditionally accepted notions of an author and originality, opposed to the new forms of hybrid authorship, algorithmic agency, distributed creativity, etc., demonstrates the development of another new means of description of this interaction.

The primary practical implications are the design of interdisciplinary systems of education tying together artistic education and literacy in the technological domain, the establishment of legal frameworks governing hybrid authorship conditions, and the establishment of ethical guidelines towards the application of artificial intelligence in the creative sector. The primary scientific value of the study is the realization of an author typology of hybrid authorship, an idea of an author concept of the joint human-machine creative collaboration that could be defined as the conceptual model that fills the gaps that exist in the theoretical knowledge on how creativity transforms in the digital age.

Study limitations are associated with the fact that the examined sources were conducted at a certain period of time; however, the sample is geographically representative, and the discussed technology is dynamic and can influence the accuracy of some conclusions. As a recommendation for future research directions: create a long-term scaling of the history of changes in creative practices, develop a theoretical base of posthumanistic aesthetics, and investigate the long-term socio-economic impacts of technological remodeling of creative industries.

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Conflicts of Interest

The authors declare no conflict of interest.

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