Artificial Intelligence in Artistic Research: Interdisciplinary Perspectives and Opportunities

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Abstract: *The transformations generated by artificial intelligence in recent years have significantly influenced both artistic practices and the research methods associated with them. This article aims to analyze how artificial intelligence is integrated into artistic research from the perspective of music, theatre, choreography and the visual arts, highlighting the opportunities that digital technologies offer for the development of new forms of creation, analysis, and interdisciplinary collaboration.*
The approach seeks to identify the main possibilities offered by artificial intelligence–based tools in processes of documentation, analysis, and artistic creation, contributing to the expansion and diversification of research methods in the arts.
The interdisciplinary approach makes it possible to highlight the points of convergence between different artistic fields, as well as the ways in which digital technologies facilitate dialogue between artists and researchers. It also emphasizes that the integration of artificial intelligence does not lead to the replacement of human creativity, but rather to the development of new forms of collaboration between humans and technology. In this context, artificial intelligence can be regarded as a tool capable of supporting innovation and the redefinition of artistic research processes.

Key words: *artificial intelligence; artistic research; interdisciplinarity; digital technologies.*

Introduction

Research is the mechanism that ensures progress, even from times when it was not yet defined or theorized. From one generation to the next and from one era to another, evolution has gone hand in hand with research, in a gradual progression toward modernity. The age of technology brings renewed approaches to research processes, particularly visible in technical and scientific fields. Artistic research requires a different attitude, based on adaptability, openness, and the correlation of methods: on the one hand, the analysis of the artistic phenomenon, and on the other, the application (as far as possible) of scientific research principles. Thus, modern research tools can also be applied, to a certain extent, in artistic research. In arts rather than merely measuring the art object the aim is to understand it, with a view to assimilating it, because arts addresse aspects that are less tangible and more closely related to states of mind. The effects of arts on individuals – and, by extension, on society – are overwhelming and an honest perspective

on this reality can serve as the starting point for recognizing its important role and, by extension, of research into it (Fărcășel 2025, 38-39).

The accelerated evolution of digital technologies in the current period has brought about significant changes in many areas of human activity, and art is no exception. Among emerging technologies, artificial intelligence (AI) stands out due to its capacity to analyze large volumes of information, generate content, and support complex decision-making processes. The development of AI-based tools has opened new perspectives for research and creation, influencing both artistic practices and the ways in which cultural and aesthetic phenomena are investigated and interpreted.

At present, artificial intelligence is used in a wide range of artistic contexts, demonstrating that AI is both a technical instrument and a factor in transforming the way creative processes are conceived, produced, and analyzed. Accordingly, artistic research benefits from new methods of exploration, documentation, and experimentation that facilitate interdisciplinary and collaborative approaches. In the field of choreography and dance, AI-based tools are increasingly used to generate movement material, support choreographic ideation, and document creative attempts during the preparation stage of artistic research. Rather than replacing the choreographer's embodied knowledge, these systems can expand the range of possible movement variations and create a space for iterative experimentation between human intention and algorithmic suggestion. However, the integration of AI also raises a series of questions regarding originality and the limits of technological intervention in the creative act – issues that require a critical examination of the relationship between human creativity and new technologies.

In this context, the present article aims to analyze the major opportunities that artificial intelligence offers to contemporary artistic research. Moreover, the ideas presented in this study were generated by the conference "Neuroplasticity in the Digital Era – The Impact of Artificial Intelligence on Creativity," organized in 2025 by the Institute for Multidisciplinary Research in Art within the "George Enescu" National University of Arts in Iași, bringing together specialists from the fields of arts, medicine, and engineering. The discussion was based on the premise that AI can act as a catalyst for reshaping neural connections, directly contributing to the development of cognitive flexibility and creative thinking in a reality where algorithms have become an integral part of everyday life.

Building on the directions opened by this academic meeting, the article explores the collaborative environment between art and science, opening new horizons of knowledge in artistic research.

Methodology

Creativity is one of the defining characteristics of the human being. „Creativity is a critical component of human cognition and behavior, playing an essential role in fostering innovation, problem-solving, and personal fulfilment. Generally, creativity is a complex and multifaceted phenomenon that involves both individual and contextual

factors". (Ștefănescu, Bălăiță, Fărcășel 2025, 218) With the emergence of generative systems capable of producing images, texts, musical compositions, or multimedia content, researchers and artists are challenged to reassess the relationship between human creation and algorithmic processes. In this context, artificial intelligence is no longer regarded as a supporting technology, but as a dialogical partner and a research tool capable of expanding the possibilities of artistic exploration.

Artistic research plays an important role in multiple fields of creative practice, supporting the development of new forms of expression and knowledge. In this regard, AI offers significant opportunities for the generation, analysis, and interpretation of artistic content, facilitating the emergence of interdisciplinary approaches that bring together the arts, technology, neuroscience, and cultural studies.

The aim of this article is to highlight the ways in which artificial intelligence contributes to the transformation of contemporary artistic research, analyzing its applications in visual arts, music, and theatre, as well as the cultural and ethical implications associated with the use of this technology.

The study employs a documentary analysis method and a critical review of the specialized literature within an interdisciplinary framework concerning the application of artificial intelligence in the artistic area. Relevant works from the fields of visual arts, music, theatre, neuroscience, and creative technologies were examined, with the objective of identifying the main directions in which artificial intelligence is used in artistic research processes.

Dance and choreography introduce a particularly relevant perspective into the discussion of artificial intelligence in artistic research because they are based on embodied cognition, spatial awareness, rhythm, and kinaesthetic decision-making. From this point of view, human–AI collaboration in dance should not be understood only as the production of digital content, but also as a negotiation between bodily knowledge, movement intention, and computational processes.

Discussion

The integration of artificial intelligence into artistic research opens new possibilities for investigation, analysis, and experimentation, while tools based on machine learning algorithms enable the processing of large volumes of information and the identification of relationships that are difficult to observe through traditional methods. At the same time, generative platforms facilitate the rapid exploration of multiple creative variations, transforming the artistic process into a space of dialogue between human intention and algorithmic capabilities.

These adaptations influence both the activity of creators and artistic research in a broader sense, in that the use of AI can contribute to the development of innovative methods for analyzing cultural heritage, to the deciphering of relationships between

artworks and artistic movements, as well as to the emergence of new forms of visual, sonic, and performative expression.

In choreographic research, generative AI can support the early stages of creation by assisting with ideation, rapid prototyping, and the documentation of movement sequences. Such tools allow choreographers to test multiple movement possibilities before or alongside studio practice, thus transforming the creative process into an expanded dialogue between physical exploration and digital simulation (Liu & Sra, 2024).

One of the most dynamic directions of development is the use of artificial intelligence in the visual arts. Contemporary artists use generative models and learning algorithms to explore forms, compositions, and visual structures that are impossible or difficult to achieve through conventional methods.

Diffusion models and generative adversarial networks (GANs) are integrated into an iterative creative process in which the artist formulates aesthetic intentions, and the system produces successive variations that can be evaluated and reinterpreted. This hybrid space functions as an environment for experimentation that expands the possibilities of visual imagination. From this perspective, the creative process appears as the result of the interaction between human intention and the generative capabilities of algorithms. Arthur Miller, in *The Artist in the Machine: The World of AI-Powered Creativity*, highlights how intelligent systems can collaborate with artists in overcoming the limits of traditional imagination (Miller 2019), while Aaron Hertzmann (2018) critically addresses the issue of originality and the status of computational systems as creators, stating in the article "Can Computers Create Art?": "Computers do not create art, people using computers create art. Despite many decades of procedural and computer-generated art, there has never been a computer widely accepted as the author of an artwork. To date, all "computer-generated art" is the result of human invention, software development, tweaking, and other kinds of direct control and authorship. We credit the human artist as author, acknowledging that the human is always the mastermind behind the work, and that the computer is a simple tool" (Hertzmann 2018, 2).

In addition to contributing to the creative process, AI is also transforming research in art history. Image analysis algorithms allow the investigation of vast collections of artworks, identifying stylistic relationships, subtle chromatic evolutions, and cultural influences that are relatively difficult to observe through conventional human analysis. In *Cultural Analytics*, Lev Manovich proposes the use of digital methods for mapping visual culture and analyzing artistic trends at scale. Moreover, Manovich emphasizes the premises underlying this approach: "Cultural analytics includes not only the application of currently available computational methods for data analysis to cultural datasets and flows, but also critical examination of these data science methods and their assumptions" (Manovich 2020, 12).

An important contribution in this field is the research conducted by Elgammal et al. (2017), which demonstrates the possibility of developing systems capable of



reproducing existing artistic styles and generating original aesthetic variations through controlled deviation from learned rules.

Within contemporary digital art, interactive installations and new media projects occupy an increasingly significant place, so that the use of AI can create new environments that respond in real time to the presence and behavior of the audience, which becomes an active part of the algorithm generating the work. A prominent exponent of this direction is digital artist Refik Anadol, whose large-scale projects exemplify how massive datasets collected from reality can be transformed, through neural networks, into digital "paint pigments," generating dynamic data sculptures that reconfigure exhibition space (Anadol 2021).

In the field of music, artificial intelligence contributes both to theoretical research and to the development of new compositional practices, in which algorithms can analyze complex harmonic, melodic, and rhythmic structures, identifying patterns and relationships that facilitate the understanding of the evolution of musical styles. Research on generative networks shows that AI can participate in compositional processes by generating new sound structures and supporting creative experimentation (Cádiz et al. 2021).

The relationship between music and dance also represents an important area for AI-assisted artistic research. Music-conditioned dance generation models demonstrate that artificial intelligence can analyze rhythmic and structural features of music and produce corresponding three-dimensional movement sequences, opening new possibilities for studying the relationship between sound, gesture, and choreographic composition (Li et al., 2021).

Generative systems enable the development of compositional sketches, thematic variations, and automated accompaniments, offering composers the opportunity to explore diverse creative directions in a reduced amount of time. Artistic research thus becomes a process of continuous experimentation, in which the creator uses technology to investigate new sonic possibilities.

At the same time, the use of AI in music facilitates collaboration between artists, programmers, and researchers, contributing to the development of interdisciplinary projects that bring together sound art, data analysis, and digital technologies.

However, artificial intelligence must be used with a heightened degree of caution and discernment. AI-based technologies are developing at an astonishing speed, which the human factor – although itself the creator – can hardly keep up with. On the other hand, AI systems possess a sufficient (though not fully controlled) degree of autonomy to initiate further steps within the processes in which they are involved without permission, generating a significant level of unpredictability. In this sense, any endeavor supported by such tools must be subject to rigorous human supervision and review.

Artificial intelligence uses existing (online) data and compiles it through complex methods, producing non-original associations that may nevertheless be useful. Researchers who rely too heavily on AI software for constructing their research risk producing clichéd

results lacking scientific and artistic relevance. In any case, in order to obtain valid and effective answers and resources from AI systems, users must pay particular attention to how prompts and requests are formulated. This reinforces the idea that AI can be useful to a researcher only to the extent that their own knowledge and skills (within their professional field as well as related areas) are rich and continuously expanding.

At present, there is no AI application capable of performing a complete and fully complex musicological analysis; instead, there are only tools that partially address analytical problems and can support the process by solving isolated tasks.

One such application, created in 2008, is *Music21*, developed with the support of the music departments of the Massachusetts Institute of Technology, Harvard University, Smith College, and Mount Holyoke College. It is a tool based on the Python programming language and designed for computer-assisted musicology. Researchers and musicians use it to study large-scale musical datasets, extract examples from the musical literature, identify elements of musical language in selected works, teach music theory concepts, investigate the relationship between music and the brain, and also to compose music. The aim of the application is to reduce the time needed to identify certain preferred musical styles.

Another useful tool for musical analysis is *jSymbolic*, a software application designed for research in music information retrieval (MIR), musicology, and music theory. Its main purpose is to extract statistical information from symbolically represented musical data, such as MIDI or MEI formats. This information is expressed in the form of feature values, which can be used for automatic classification, querying large musical databases, or empirical research conducted by musicologists and music theorists. The application *Partitura*, on the other hand, is designed to be used by individuals with minimal musical training. For stylistic classification using machine learning technology, the *MusPy* application – a music generation library – can be useful. For analyzing elements of musical language in audio files, the capabilities of *Sonic Visualiser* can be employed.

Ultimately, however, musicological analysis is not a purpose in itself, but one of the main pathways toward understanding music and its meaning. While technical analysis can be achieved with the help of AI, the essential task remains the responsibility of the human factor: to integrate the entire analytical process into a unified vision that highlights the ultimate meaning and role of musical art. Artificial intelligence should be regarded as an ally in the research process, operating under the authority of human capabilities.

Theatre is another field in which the integration of artificial intelligence generates significant opportunities for artistic research. Natural language processing tools can support the development and analysis of dramatic texts, offering new perspectives on narrative construction and stage dialogue. AI is explored both as a dramaturgical tool, through the generation and analysis of texts, and as a performative partner in experimental contexts of collaboration between actors and intelligent systems (Mathewson & Mirowski, 2018; Rosa et al. 2020).

In addition, intelligent technologies are used to extend digital scenography, control multimedia elements, and design interactive experiences that reshape the relationship between actor and audience. By integrating algorithmic systems into the performative process, contemporary theatre explores new forms of artistic representation and communication. These transformations contribute to the emergence of hybrid forms of artistic expression in which technology becomes an integral part of the stage experience. At the same time, AI can facilitate the analysis of audience reactions and the adaptation of the theatrical experience according to behaviors observed during performance.

The specialized literature highlights that artificial intelligence contributes to the transformation of artistic research by expanding the possibilities of documentation, analysis, and experimentation, and that the capacity of algorithms to process large volumes of information facilitates the identification of patterns and connections that can support the development of innovative approaches in artistic research. In their study published in "Understanding and analyzing AI art: A review of methodologies and cultural implications", Eva Cetinic and James She demonstrate the improvement of AI-generated art in terms of emotions and styles, the minimization of compositional differences between human-made and AI-generated art, as well as the way in which it is changing audience preference: "It should be assumed that this statistic demonstrates that the advancements in generative AI capabilities enable these systems to emulate artistic styles and potentially evoke human-like emotions, but also reflect a shifting perception of AI within the wider community. As AI technology continues to develop, its ability to produce visually appealing and conceptually engaging art is destined to improve. This, in turn, will lead to audience preferences changing over time and eventually one can imagine a world where there is no difference between AI- and human-generated art" (Cetinic & She 2022).

Similarly, generative platforms enable the rapid exploration of creative variations, contributing to the emergence of new forms of artistic expression, which makes the artistic research process dynamic, based on the interaction between human creativity and the algorithmic capabilities of technology (Mazzone & Elgammal 2019). Likewise, M. Vijayakumar and C. Rathiuksha, in their study "Human-AI Collaboration in Creative Arts: Exploring Co-Creation and Artistic Expression", explore creative collaboration between humans and machines, stating that "artificial intelligence (AI) is developing in the creative arts, presenting it as a collaborative tool that can improve artistic expression rather than as a substitute for human creativity" (Vijayakumar & Rathiuksha, 2025).

A relevant aspect is the dissolution of disciplinary boundaries, making the dialogue between artificial intelligence and the arts increasingly fluid. Beyond the advantages that AI offers to artistic research and creation, a number of questions remain open regarding how audiences perceive and interpret algorithmically generated works.

In this context, the study conducted by Lombardi and Di Cesare (2022) provides important insights into the relationship between aesthetic experience and cognitive processes. The authors investigate the role of "forms of vitality" – subtle expressions of

human behavior such as gestures, movement, tone of voice, or touch – in communication and perception. The research highlights that these forms are processed through specific brain mechanisms and contribute to the affective understanding of social and artistic experiences. The results suggest that original artworks, which preserve traces of the creator's gestures and intentions, can activate embodied simulation mechanisms and empathetic processes in the observer. In the experiments analyzed, cortical motor activation was observed in the case of original artworks, but not in images generated by artificial intelligence (Lombardi & Di Cesare 2022).

In dance practice, even the inaccuracies or "glitches" produced by generative AI may become valuable compositional stimuli. Instead of being treated only as technical errors, these unexpected deviations from realistic movement can be reinterpreted by choreographers as material for improvisation, selection, and artistic refinement, emphasizing the creative role of human interpretation in AI-assisted dance composition (Wallace & Martin, 2022).

However, these consequences do not diminish the value of AI-assisted creations, but rather suggest that aesthetic experience is influenced by complex cognitive and affective factors that go beyond simple visual appreciation. From this perspective, future artistic research may benefit from closer collaboration between the arts, artificial intelligence, and neuroscience, in order to understand how new technologies reshape the relationship between creator, artwork, and audience.

Conclusions

In the digital era, the human brain is not overwhelmed by technology, but rather adapts and transforms in relation to it. In this context, artificial intelligence can be leveraged as a tool for exploration and creative development, contributing to the acceleration of research processes and idea generation. When used critically and responsibly, AI can function as a dialogical partner and support for artistic activity, without replacing the individual's cognitive and creative contribution.

Thus, based on our analysis and the examples of artificial intelligence use in the artistic field, we can conclude that AI supports the diversification of research and creative methods, offering new tools for exploration, analysis, and experimentation. The integration of intelligent technologies is not limited to the automation of existing processes, but also encourages the emergence of new artistic practices based on the interaction between human creativity and algorithmic capabilities.

In the visual arts, music, and theatre, artificial intelligence facilitates the development of innovative forms of expression and stimulates interdisciplinary collaboration between artists, researchers, and specialists in the technological field. Dance and choreography further demonstrate that AI can function as a tool for variation, reflection, and movement analysis rather than as a substitute for artistic authorship. In this sense, the value of AI in choreographic research lies not in autonomous creation, but in its capaci-

ty to stimulate new forms of embodied experimentation, interdisciplinary collaboration, and critical reflection on the relationship between body, technology, and performance. At the same time, perspectives offered by neuroscience demonstrate that artistic experience remains deeply connected to the affective and embodied dimensions of human perception, an aspect that underscores the importance of the creator's contribution to the artistic process.

However, the integration of artificial intelligence also raises challenges regarding authorship, originality, and intellectual property. Current legal frameworks were designed for works created by human authors, and the development of generative systems requires a reconsideration of fundamental concepts of copyright. At present, the dominant tendency is the recognition of legal protection for those creations in which human contribution remains decisive in guiding and controlling the creative process.

Therefore, artificial intelligence supports the transformation of contemporary art by opening new spaces for exploration, experimentation, and collaboration. The future of artistic research is shaped by the balanced integration of intelligent technologies into creative processes, valuing both the algorithmic capabilities of AI and the human dimensions of imagination, experience, and artistic expression.

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