WHIOCE PUBLISHING PTE. LTD.
PROVIDING FIRST-CLASS SCIENTIFIC INFORMATION FOR TOP SCHOLARS

2026 Volume 4, Issue 2
Lecture Notes in Education, Arts, Management and Social Science
ISSN(Online): 2705-053X

The Era of Intelligent Dance: AI-Driven Innovation and Practice in Dance

Zihe Yu*
Minzu University of China, Beijing 100081, China

**Author to whom correspondence should be addressed.*

Abstract: In today's era of rapid digital technology iteration, artificial intelligence (AI), as a disruptive force, is deeply penetrating various fields of artistic creation, performance, and education. The dance art has also ushered in a new development stage of "integration of intelligence and dance". The in-depth integration of AI and dance can not only improve dance creation efficiency, enrich performance forms, and optimize teaching effects, but also promote the organic unity of traditional inheritance and modern innovation in dance art. Based on this, this paper conducts research on AI-driven dance innovation and practice, systematically sorts out the practical challenges and important values of AI in dance applications, and explores the innovative application paths of AI in the field of dance, aiming to empower the creative expression and performance presentation of dance art.

Keywords: artificial intelligence; dance innovation; motion capture

Online publication: February 26, 2026

1. Introduction

With the rapid development of artificial intelligence technology, technologies such as deep learning and motion capture have broken the barriers between art and technology, promoting dance art into the "era of intelligent dance". The core of the era of intelligent dance is the in-depth integration of AI and dance, rather than a simple superposition. From motion generation and style transfer in creation, to real-time feedback and virtual-real interaction in performance, and then to intelligent operation in the industry, AI is comprehensively reshaping the production and communication mode of dance art. It not only retains its emotional core but also breaks the limitations of human physiology, space, and resources, realizing diversified development[1]. Therefore, exploring AI-driven dance innovation and practice is of great significance.

2. Challenges of AI Application in Dance

2.1. Weakened Artistic Subjectivity and Lack of Emotional Expression

The core of dance is "conveying emotions through dance", which contains the dancer's emotional experience and cultural understanding, something that AI is difficult to replicate. As a tool based on data and algorithms, AI lacks independent

emotional perception and artistic thinking abilities. The movements it generates often remain superficial, lacking emotional core and appeal. AI can imitate the body charm of classical dance and generate impromptu movements of modern dance, but it cannot understand the spirit of Eastern aesthetics, nor can it reproduce the subtle physical changes of dancers caused by emotional fluctuations; although virtual dancers can complete movements accurately, they are difficult to resonate emotionally with the audience[2].

2.2. Imperfect Data Management System

The application of AI in the field of dance is inseparable from the support of massive data, which includes not only physical movement information but also dancers' privacy and copyright of classic works. The current relevant systems still have many hidden dangers. On the one hand, data collection lacks standardization. Some institutions collect and abuse data without obtaining the authorization of dancers, infringing on privacy rights[3]; on the other hand, the standardization level of dance data is low. The data formats and accuracy of different institutions are inconsistent, making it difficult to achieve sharing and interconnection, which restricts the efficiency of algorithm optimization and the development of intelligent dance integration.

2.3. High Technical Threshold and Difficulty in Popularization and Application

The application of AI in the field of dance requires professional equipment, algorithms, and interdisciplinary talents. The high technical threshold makes it difficult to popularize at the grassroots level. Professional equipment such as motion capture systems is expensive, which is difficult for grassroots dance groups and training institutions to afford; there is a shortage of interdisciplinary talents who understand both dance and AI, leading to a disconnect between technical application and practice. At the same time, AI technology is complex to operate, and grassroots practitioners and learners lack systematic training and are difficult to use proficiently, making AI technology limited to professional groups and restricting the breadth and depth of intelligent dance integration[4].

3. Important Values of AI Application in Dance

3.1. Conducive to Empowering Dance Creation

Traditional dance creation relies on the creator's experience and inspiration, which is inefficient and prone to thinking limitations. AI technology breaks this predicament, providing creators with new tools and ideas and enriching the forms of creative expression. AI algorithms can quickly generate movement sequences according to keywords such as dance style and rhythm, shortening the creation cycle, improving efficiency, and providing inspiration for group dance and impromptu dance creation; style transfer technology can realize the integration of different dance styles and artistic forms, breaking the boundaries of dance styles, providing more possibilities for creation, and helping to improve the quality of works[5].

3.2. Conducive to Optimizing Dance Performance

Traditional dance performances are limited by human physiology, stage space, etc., making it difficult to achieve innovative presentation. Through technologies such as motion capture and virtual simulation, AI optimizes performance forms and enhances stage appeal. Motion capture and real-time feedback technology can accurately capture dancers' movements, provide real-time feedback on deviations, help dancers optimize their movements, and improve the coordination of duets and group dances. Virtual simulation, holographic projection, and other technologies can construct a virtual-real combined stage scene, interact with real dancers, and break space limitations[6].

3.3. Conducive to Promoting the Integration of Intelligent Dance Resources

AI has important value in promoting the integration of intelligent dance resources. The preservation, management, and sharing of traditional dance resources are often limited by physical carriers and scattered systems, while AI can build a

digital intelligent resource hub. Through natural language processing, computer vision, and knowledge graph technology, AI can conduct in-depth analysis, intelligent tagging, and structured association of massive heterogeneous resources such as dance videos, text records, scores, costumes, and stage design, forming an interconnected dance knowledge network.

4. AI-Driven Dance Innovation and Practice

4.1. Introduce AI Algorithms to Promote Dance Creative Expression

Focusing on three key points: motion sequence generation, style transfer, and multi-dance style integration, introduce advanced AI algorithms, optimize the creation process, and realize the intelligent and diversified development of dance creation. First, AI algorithms can quickly generate a series of dance movements to provide inspiration materials for dancers. Users only need to give keywords such as dance style, rhythm, and emotion, and AI will immediately generate a set of movements that meet the requirements, which are then improved and processed by humans with imagination, greatly shortening the creation cycle. This greatly improves work efficiency. For example, the RAG+GAN artificial intelligence choreography system can judge dance styles and music beats, generate its own dance choreography and present it in 3D form, and the score of its original dance is higher than that of ordinary people; for group dance choreography, AI can quickly produce many different movement combinations, helping to avoid movement repetition and enrich the form of group dance performance; for impromptu choreography, it can respond to changes in music beats and emotions in a timely manner, generate corresponding physical movement sequences in real time, and provide a reference basis for dancers' choreography[7]. Second, AI's style transfer technology can integrate different types of dances and schools, breaking the limitations of traditional dance and enriching the form of dance expression. For example, with the help of AI's style transfer technology, the body language characteristics of classical dance can be transferred to modern dance, and the hand movement characteristics of folk dance can also be transferred to street dance steps to form a new type of dance; similarly, other art forms such as paintings, music melodies, and even film and television works can be used as reference objects in the choreography process to achieve the integration of different art categories. Google's artificial intelligence choreography project uses the understanding of music emotions and sense of rhythm to design dance movements that match the plot. The domestic DanceForms software also adopts the method of style transfer, which can quantify the dancer's own characteristics and transplant them to virtual dancers, providing more possibilities for dance creation[8].

4.2. Apply Intelligent Technical Means to Optimize Dance Performance Presentation

Dance performance is a bridge between dance art and the audience. Applying intelligent technical means such as motion capture, virtual simulation, and real-time feedback to optimize the presentation form of dance performance and improve the quality and appeal of stage performance is an important path to promote the innovation of dance performance. Combined with the actual needs of dance performance, focus on advancing practice from two aspects: motion capture and real-time feedback, and stage visual effects and audience interaction, to create a more innovative and immersive dance performance[9]. First, adopt high-precision real-time capture technologies such as photoelectric motion capture technology and inertial motion capture technology to accurately capture dancers' physical movements, transmit parameters such as the trajectory, amplitude, and speed of each part of the dancer's body to the computer in real time, and analyze and process them with intelligent software. It can online correct the posture errors and omissions of dancers during performance, help them adjust their movements in a timely manner, and enhance the accuracy and coordination of their own movements. For example, during the performance of ballet dancers, this method can be used to conduct online detection of the posture, strength, and standardization of their key movements such as arabesque and five-position rotation, and feed back the results to the dancers to guide them to improve their behavior and improve performance quality. At the same time, combine motion capture technology with robot dancers to enable them to accurately imitate the movements of real dancers and perform together with robot dancers, breaking the physiological limitations of humans and creating a more innovative performance form[10]. For example, Beijing Dance Academy produced a work called "The Soul of

Qin Terra-Cotta Warriors", which used motion capture technology to complete the co-performance of real dancers and virtual dancers, presenting a new kind of beauty and winning the first place in the dance category of the world humanoid robot competition. In addition, the use of motion capture technology in group dance performances allows multiple dancers to make the same movements, avoiding mixed movements, and improving the neatness and consistency of group dance performances. Second, considering the stage performance effect and on-site viewing experience, adopt AI virtual simulation system, holographic imaging technology, real-time rendering and other technologies to construct a virtual-real combined stage space to improve the stage presentation effect. With the help of AI virtual simulation technology, virtual stage backgrounds, virtual props, and virtual actors can be generated and projected into real scenes, creating a strong visual impact and breaking the limitations of traditional theater space. For example, the AI ballet "Fusion" produced by the Leipzig Ballet in Germany uses artificial intelligence to design the stage setting, costumes, and sound effects of the ballet. At the same time, it establishes a complete set of virtual ballet dancers based on hundreds of the world's top ballet dancers, which not only maintains the artistic beauty of ballet but also has distinct movement characteristics. It also introduces AI real-time rendering technology to adjust the stage lighting, color, and special effects in real time according to the dance rhythm and emotional changes, so as to enhance the stage expression in a way that is more in line with the emotions expressed by the ballet[11]. Third, develop an AI audience interaction system, use cameras and microphones to collect real-time feedback from the on-site audience: applause, cheers, facial expressions, physical movements, etc., and use artificial intelligence to analyze the information fed back by the audience, and adjust elements such as dance steps, movement rhythm, and lighting as the basis to achieve real-time interaction with the audience. For example, in impromptu dance performances, the rhythm of the dancers is controlled according to the audience's applause frequency; the emotional expression of the dance is adjusted according to the audience's facial changes, allowing the audience to better engage in it and enhance the fun of watching. An AI interactive program can also be developed: this allows the audience to participate in dance activities using their mobile phones, such as sharing their own dance movements, and then AI generates an interactive video of dancing with professionals, which not only improves the audience's participation but also maintains fun, and to a certain extent promotes the transformation of dance performance form from "one-way display" to "two-way communication"[12].

4.3. Integrate Tradition and Intelligence to Establish Artistic Creation Guidelines

Dance innovation in the era of intelligent dance is by no means a one-way empowerment of AI technology, nor is it a subversion of traditional dance art. Instead, it is necessary to realize the in-depth integration of the essence of traditional dance and AI technology. While empowering technology, establish clear artistic creation guidelines, adhere to the essential core of dance art, avoid falling into the misunderstanding of "technology supremacy", and achieve a benign symbiosis between technology and art. Traditional dance carries national cultural genes and artistic aesthetic pursuits, while AI provides innovative tools and paths. The organic integration of the two is the core direction of dance creation in the era of intelligent dance. Clear artistic creation guidelines are the key to ensuring the quality of integration and promoting the healthy development of dance art[13]. The key to the in-depth integration of traditional and intelligent methods is to protect and develop classical dance culture and art, and realize innovative development with the help of AI technology. We should take classical dance culture and art as the core, define the scope involved in the application of AI in dance development, and avoid excessive technical intervention in art. AI can only be used as an auxiliary creation tool to enhance the artistic expression and cultural communication of dance, and cannot dominate the entire creation process. In the process of integration, we should follow the principle of "art first, technology for use", integrate the aesthetic standards and emotional expression needs of classical dance into the optimization of AI algorithms, so as to realize the requirement that the rhythms and works produced by AI conform to the aesthetic norms of classical dance and have a sense of the times, and achieve the organic unity of "preservation" and "creation"[14]. To formulate dance generation principles based on the intelligent environment, it is necessary to construct from the following three aspects to ensure the standardization and aesthetics of dance production: first, follow the principle of emotional expression, that is, any AI dance production element should

contain an emotional core, avoid the formalized production mode of "skills without emotion", and point out that artists should add their own emotional experience and cultural cognition in the process of using AI assistance, so that dance works can reflect the true expression of profound emotions and contain a lot of cultural and historical connotations, achieving "conveying emotions through dance and carrying culture through dance". Second, adhere to the principle of traditional inheritance, that is, intelligent creation should abide by the artistic laws and cultural genes of traditional dance, not arbitrarily change or distort its behavior system and cultural connotation, and advocate improvement on the basis of inheriting tradition to realize the development transformation of traditional dance art. Third, adhere to the principle of aesthetic guidance, that is, the methods adopted by AI in participating in dance creation should meet the public's demand for beauty and the laws of artistic development. We should not only innovate but also appreciate, and not blindly pursue the technicality of skills, ignoring the aesthetic characteristics of art itself, so as to promote the creation of high-level and high-grade dance works[15].

5. Conclusion

In summary, the arrival of the era of intelligent dance has promoted dance art into a new stage of development. AI comprehensively reshapes the modes of dance creation, performance, and education, injecting vitality into its innovative development. The in-depth integration of intelligent dance can not only enrich creative expression, improve performance effects, and optimize education quality but also promote the unity of traditional inheritance and modern innovation in dance art. With the iteration of AI technology, the integration of intelligent dance will be more in-depth and diversified. Relevant practitioners should adhere to the principle of "technology serving art", promote dance art to radiate new vitality in the era of intelligent dance, and realize a virtuous cycle of classic inheritance and innovative development.

Disclosure statement

The author declares no conflict of interest.

References

[1] Wen JM, 2025, Aesthetic Experience and Motion Symbol Projection: Aesthetic Reshaping of AI Choreographed Art Works. *Art Garden*, (1): 59-63.

[2] Jin SS, 2022, Research on the Impact of Artificial Intelligence on Dance Teaching. University of Electronic Science and Technology of China.

[3] Deng YF, 2024, Is There Artistic Value in AI Choreographed Works—A Digital Art Criticism Based on Aesthetic Experience. *Journal of Aesthetic Education*, 15(5): 64-71.

[4] Yang JH, 2025, Application Analysis of Artificial Intelligence Technology in Dance Training Space Design. *Nanqiang Beidiao*, (7): 85-88.

[5] Sun YH, 2025, Application of Artificial Intelligence in Dance Training Space Design. *Earthquake Resistant Engineering and Retrofitting*, 47(1): 196.

[6] Liu L, 2025, Living Protection of Shaanxi Intangible Cultural Heritage Folk Dance in the Era of Artificial Intelligence. *Art Grand View*, (2): 55-57.

[7] Luo LN, Bai Y F, 2025, Research on Digital Communication and Protection of Hebei Folk Dance Culture in the Intelligent Era. *New Legend*, (1): 44-46.

[8] Deng YF, 2025, AI Choreography Empowers the High-Quality Development of Dance Creation: Mechanism, Core, and Direction. *Xinjiang Art (Chinese Edition)*, (1): 4-12.

[9] Deng YF, 2024, AI Choreography and Reflection on the Subjectivity of Dance Creation. *Chinese Dance Science*, (2): 114-124+337-338.

[10] Tong Y, Hu YD, 2024, Artificial Intelligence and Dance: The Construction of Body Aesthetics in the "AI+" Era. *Studies in Art*, (1): 72-77.

[11] Xu R, Guo JM, 2024, The Logical Connotation and Challenges of the Digitization of Dance Language in the Era of Artificial Intelligence. *Journal of Beijing Dance Academy*, (6): 48-54.

[12] Liu C, 2024, Re-recognizing Dance Creation Under Generative Artificial Intelligence. *Contemporary Dance Art Research*, 9(4): 10-18.

[13] Li LN, Ma A, Wang HH, et al., 2024, Does Dance Need AI?—Innovative Development of Dance Empowered by Generative AI. *Golden Key (Chinese and Mongolian Editions)*, (4): 70-74+80.

[14] Zhang HL, 2022, Research on Automatic Generation of Robot Dance Movements Based on Artificial Intelligence. *Techniques of Automation and Applications*, 41(4): 82-85+165.

[15] Deng YF, 2024, Human-Computer Interaction: A Reflection on the Subjectivity of Choreography in the Intelligent Era. *Journal of Yunnan Arts University*, (4): 31-37.