A Probe into the Practical Paths and Values of Generative AI in Empowering Musical Theatre Art Creation

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Abstract: The generative AI is changing the way of creating music in the digital intelligence age, which has a limited cycle and an inability to be flexible with its expression and a high price. The AI can help with the important aspects that are text, music, visual design, sound and editing, as it has the ability to assist in the most critical connections like scriptwriting, composition, stage design, production of sound, and promotion. This article will discuss the ways to integrate the use of AI to enhance the creative process, efficiency, creativity, and communication, as well as how to avoid ethical risks and aesthetic homogenization to make the musical art more innovative.

Keywords: Generative AI; Musical; Human-Machine Collaboration; Creative Production; Cultural Adaptability

1. Introduction

1.1 Research Background and Significance

1.1.1 Development of generative AI

Generative AI is a paradigm shift of rule-based systems to autonomous creative agents. It does not require explicit rules as it allows content generation, unlike discriminative AI. Predictive models make predictions based on data and generative models generate new data . The influence of AI on music theatre and creative processes can be seen in examples. This change enables the realistic creation of data in various ways due to deep learning. It is now possible to reconstruct unique artistic styles accurately.[1]

Multimodal content is now being generated by generative AI. The initial symbolic AI had no creativity as the rules were clearly defined and in Chinese music instruments, students are more creative due to less barriers that can be found in other tools. Using massive volumes of data, models will be able to learn with an artistic approach and create a piece that cannot be created by humans only.

Generative AI has come of age as a practical tool in creative disciplines, making a transition from reproduction to exploration. It takes care of the production, allowing humans to focus on the conception, and the boundary between the two is becoming increasingly blurred. This collaboration boosts creativity by merging intuition with accuracy, giving rise to co-creation. AI can also help teach art and redefine the value of digital art, as discussed in stage performance research.

1.1.2 Emergence of AI in arts

AI is also a remarkable art form and has revolutionized the music and theater industry. It can be used by composers and producers in order to analyze large data of music and produce new music. As an illustration, AI systems are able to generate complete songs on the basis of the themes that users would provide with them as they make it easier to create and come up with new ideas which are impossible to think of in human minds.[2]

Theater employs AI to design the stage, and 3D models of realistic sets are developed so that designers can easily imagine their ideas. It also assists choreography by examining movement and recommending new steps.[3] In storytelling, AI examines scripts and foresees reactions of the audience to assist in perfecting plays. Virtual AI actors allow realistic acting and new characters. All in all, AI is changing theater as it provides fresh creative instruments and opportunities to be innovative.

1.1.3 Significance of the study

AI is a generative force that will be helpful in the creative, production, education and theory of music theatre. It is also innovative in its approach to creating new music and choreography, which would not have been possible to inspire. As part of production, it has an impact on efficiency by being able to produce the drafts and simulate them quickly and at low cost, as well as having more flexibility and

scalability when working with various venues and audiences.[4] Teaching tools provided by AI can be used to teach the trends of the industry and the skills of collaboration. On theoretical level, it provides an opportunity to enrich the study of AI-art and make the sector more progressive and flexible in the world of digitalization.

1.2 Research Content and Method

1.2.1 Research objectives

The paper will explore the actual applications and principles of generative AI in the creation of musical theatre art. The recent studies indicate that generative AI transforms artistic innovation routines to a considerable extent. First, it demonstrates how AI can be used to enhance the creative process, including improving emotional expression and analyzing existing music to create new compositions with new features. Second, it discusses human artists working together with AI using both human creativity and data-processing of AI to make production efficient such as scriptwriting. Third, it identifies new forms of art expressions made possible by AI, which transcend traditional limits in stage design to achieve immersive effects. Moreover, it emphasizes on the efficiency of AI in simplifying processes such as choreography and its economic advantages in terms of cost saving. Lastly, it analyses the long-term effect of AI on the reception of the audience, styles of art, and professional training, giving an insight into the use of AI in musical theatre .[5]

1.2.2 Research scope

This article will discuss the issue of AI in musical theatre. It is a topic that I would like to limit it to, and I believe that it can be thoroughly discussed. It explores the use of generative AI as an aid in composing music by creating melodies, harmonies, and rhythms which are based on the artistic idea. The other thing that can be done with the help of AI is lyric writing where the lyrics can be created and improved using the themes provided, and this is done together with the human writers. This paper also discusses how AI can be used to design the stage and choreography (e.g., modeling the stage space, lighting, and movements) to create a more visually appealing performance. As mentioned in the research literature, AI has the potential to offer suggestions of the best designs and provide a sequence of the choreography to come up with new ideas. Moreover, the study includes the impact of AI on the audience such as personalized and interactive performances where the show is adjusted according to the situation. However, it does not cover the development of AI technology in other areas of the performing arts industry and its effect on the society over time.[6] The focus of the study is narrowed down so that the results of the study can be applied to the process of making a musical theatre.

1.2.3 Methodology overview

The research applies a holistic approach that entails case studies, interviews and literature review to analyze the actual - life courses and principles of generative AI in facilitating musical theatre art production.

1.3 Thesis Structure and Innovation

1.3.1 Thesis structure

This thesis is devoted to the use of generative AI in musical theatre creation. It presents the emergence and influence of AI on creative limits. Research indicates that learning based on AI increases the creativity of music. The methodology applies structural equation modeling to examine the acceptance of AI by music fans in composition, where objectives are aimed at AI applications and integration using case studies and interviews.[7] The theoretical framework includes the basis of generative AI, neural networks, and dynamics of AI-human creativity. Case studies indicate an increasing interest in the potential of GenAI and research requirements. Analyses provide domestic and international examples with different professional perspectives and comparative insights. In practice, it can be seen that GenAI promotes creativity through human-AI interaction and enhances efficiency. The issues involve technical constraints, artistic assimilation, UX design, and ethical issues such as authorship. The conclusion provides a summary of results, implications, and recommendations on future research, technological developments, and policies.

1.3.2 Innovative aspects

The paper is an original article on the application of generative AI to the musical theatre art. It will first cover how AI can break through the creative boundaries. Hong and Lee, in their study, have demonstrated that AI has been able to change the music-making process by taking large amounts of work and making it into new songs, lyrics, and dances with a mix of genres. Second, human-AI interaction, in which AI acts

as a machine, according to Kou, was found to be significant. The artists are using the generated content of AI as a source of inspiration and creativity to produce various works. Thirdly, artificial intelligence has introduced additional forms of art such as virtual characters that reach out to younger people. Fourth, AI can also help to reduce time and cost when producing scripts, scores, designs, etc., and this is what Yanxin Mao mentions. Generally speaking, the article gives some fresh perspectives to make the musical theatre more innovative.[8]

1.3.3 Theoretical and practical contributions

The paper on the generative AI of the musical theatre art is both theoretical and practical. It can be seen as a theoretical contribution to the debate on the role of artificial intelligence in the process of creativity, which does not consider inspiration as something that only people possess. As an example, we may take the use of the generative AI to create new scores and scripts, which will alter the perception of artistic creation. The work of Zhang Xiaobing proves that it is possible to create music with emotional content using GANs, and the field of arts has more possibilities of being creative.[9] This leads to the larger theory of interaction between AI and art. In practice, the research helps the practitioners of the musical theatre to simplify the creative process, i.e., the artificial intelligence can produce some initial concepts of the music, choreography, design, etc., thus saving time and effort. It also saves money through automation of the activities such as simple script writing and designing stages. The cultural preservation and innovation are further supported by the AI virtual technology offered by Bing Tian. Also, AI makes it easier to scale up the production and adjust it to various audiences and locations. The paper is also an educational tool where students would learn about the use of AI tools and how they could apply them in their future careers in the digital world.

2. Methodology

2.1 Case Studies and Data Collection

2.1.1 Selection of case studies

The use of generative AI in musical theatre is the subject of case studies. We have selected a number of cases to be used to apply generative AI to music theatre and we have found them to be well written and well researched in the form of reports, academic works, and news articles on the topic.

Representativeness is also important, as we make sure that cases represent different areas such as scriptwriting, music composition, choreography and stage design. An example of this is a case on AI-generated musical scores can be combined with another one on dynamic stage design which provides a wide view of the influence of AI in musical theatre.

The diversity of cases is necessary, including both domestic and international examples to indicate the local adaptations and global trends of generative AI in musical theatre. We examine success and failure situations in order to determine best practices and difficulties like the lack of emotional understanding of AI. The latest examples are given priority to show the fast development so that current conclusions could be made regarding the practicality of AI in empowering the creation of musical theatre art.

2.1.2 Data gathering techniques

The research on generative AI in musical theatre was based on the interview and observation as a data collection method. The effects of AI, including its challenges and advantages, were identified through interviews with industry professionals such as composers and directors, such as breaking creative bottlenecks. The use of AI in productions was observed, which influenced the flow of performance and audience experience.

Document analysis was also important. We read research papers to learn about the theory behind generative AI in arts, industry reports to learn about the current trends of AI in musical theatre, and production scripts containing AI-generated content to learn about the use of AI in scriptwriting such as plot and character development. Together, these approaches allowed us to study the influence of generative AI on the creation of musical theatre art.

2.1.3 Analysis framework

We structure the framework of analysis so that there is a comprehensive process in interpreting data about generative AI in musical theatre. The qualitative analysis involves interviews with artists and producers to investigate creative processes and the effect of AI. Quantitative analysis collects information on time saving and costs to statistically analyze efficiency. Comparative analysis contrasts global case studies to learn practices.[10] Content analysis analyzes AI generated artworks to evaluate new

expressions. Thematic analysis detects repetitive themes such as technical or ethical concerns to come up with conclusions and recommendations.

2.2 Technical Approaches

The most important aspect of the music generation in theatre is GANs and transformers. Adversarial training of GANs allows them to generate high-quality music, and transformers can be used to analyze and create music that will fit into a particular genre. In musical theatre, AI technology has been integrated with the conventional techniques: the composers have polished the score generated by the AI system using the principles of music theory; choreographers have developed the dance sequences based on the advice provided by the AI system; designers have improved the lighting and sets created by the AI systems with the help of stagecraft knowledge; writers have enhanced the scripts generated by the AI systems with the help of cultural knowledge. This union of artificial intelligence and human intellect as well as emotional quotient is an innovation production. The criteria of evaluation are the musicality, story flow, expressiveness, traditionalism, and originality.

3. Case Analysis

3.1 Domestic Case Studies

3.1.1 Examples from china

The use of generative AI is becoming more popular in Chinese musical theatre, which boosts creativity. In scriptwriting, AI can analyze existing scripts to generate storylines, dialogues, and character arcs, speeding up the process and offering fresh ideas. Human playwrights then refine AI-produced drafts. AI also helps explore narrative structures for more engaging plots.[11]

AI mixes traditional Chinese music with modern Western music to compose original scores in music composition. As an example, it can mix pentatonic scales and modern orchestration to produce a new sound.

AI assists with set design by generating 3D models from the settings and mood of a story. This allows for creative and productive sets. The AI can come up with whimsical designs that would be hard for humans to conceive of on their own.

AI in choreography can be used to examine dance patterns and create sequences, which can be applied to large numbers. It also modifies movements to suit the capabilities of performers to make performances smoother.

Overall, generative AI is transforming how Chinese musicals are produced and presented.

3.1.2 Analysis of outcomes

The effects of generative AI in Chinese musical theatre are evaluated by the reception of the audience and artistic influence. Reception of the audience is important because AI can gain interest with new music, which makes shows more dynamic. In terms of artistry, AI helps to write scripts as it creates new plots based on previous works and also helps choreography since it can simulate movements to create complex dances. Nevertheless, others consider the AI components too mechanical or unemotional, they lack human touch and cultural nuances. On the whole, the outcomes are ambivalent: AI is able to attract audiences and enhance the artistic elements, but should provide a greater contribution to the human-oriented nature of musical theatre.

3.1.3 Lessons learned

The experience of using generative AI in musical theatre at home is useful. To begin with, AI has a significant effect on creativity whereby the composers can experiment with new styles and forms of music as well as AI-generated themes, rhythms, and harmonies that stimulate compositions. This improves content of theatres and artistic expression.

Second, the human - AI joint work. The use of AI by artists is a creative one. It mixes human feeling and cultural consciousness with AI's ability to create new things. In any case, it should be emphasized that people are the core of creativity and AI is an assistant in the process.

Third, AI enhances the efficiency of operations through the optimization of scriptwriting, choreography and stage design. It rapidly creates drafts of scripts and resource-saving, which saves time and money.

Another lesson is that AI needs to be adapted to the specific requirements of musical theatre. AI-generated music and narratives should be culturally relevant.

Finally, the authorship and originality of AI content is an ethical problem that needs to be discussed. It has fair rules. The cases are helpful in the future sustainable development of the musical theatre with AI.

3.2 International Case Studies

Musical theatre is being changed by the use of generative AI and it is making a lot of creativity. In America, there is AI that can make music as it uses data to create musical pieces in an effective way. It also helps with the set design in Europe. The dialogue between characters is done through AI in Japan whereas choreography is performed through AI in South Korea. These are some of the instances of how the AI has potential in the industry.

The comparison of the international and local experience can be seen in the fact that both aim at increasing creativity with AI as a part of composition and scriptwriting, and they use the same generative models. The international theatre is creative within the Western culture and domestic practice is more or less creative in the Chinese culture, as the latter combines the Western culture with the Chinese culture. In the world, it focuses on business development; in the country, it finds new ways of doing business. Abroad, there are better technology to access tools whereas in the home front, the tools may be limited due to lack of resources.

For China, international experience suggests that AI can be a source of inspiration for creative scores, an aid to storytelling, and a means of producing cost-effective virtual sets. The importance of human-AI collaboration can be highlighted to improve the efficiency and quality of Chinese productions.

4. Practical Applications and Values

4.1 Creative Empowerment

4.1.1 Enhancing creativity

Generative AI can also be used to create music and musicals as it is a creative process in the sense that it is able to generate the melody, harmony or other elements of music which are not bound by the traditional rules. It studies various pieces of music to write its own, which will add more to the language of music and the scope of topics.[12]

In scriptwriting, AI produces plots, dialogues and scripts on the basis of input themes to accelerate initial ideas and save time. It also reviews current scripts in order to give references and learns musical theatre regulations to provide creative suggestions.

In the case of visual design, AI develops stage sets, costumes and lighting effects that are specific to the style of the play. It assists designers in exploring possibilities and enhancing efficiency by simulating visual styles and producing 3D models.

AI also promotes cooperation between musicians, playwrights and designers with the help of common tools. Creative intentions are introduced by teams to be used in AI-generated results that are then discussed to enhance the overall creativity and promote artistic integration.

4.1.2 Collaboration between humans and AI

The AI - artist relationship in the musical theatre production is a complicated and influential one. Artists are able to provide emotions, cultural knowledge, and experiences that are of great importance for producing meaningful works. It's possible for AI to generate content quickly, like melodies, lyrics, and stage design, which helps speed up creativity and provides options. The first step in collaboration is artists choosing the theme and mood. AI can be used to compose music by providing ideas for further development, create choreography by suggesting dance moves, and produce shows by optimizing the designs and schedules. This process makes use of the precision of AI with the artistry of human beings, enhancing the quality of the performance, and it is essential for the growth of musical theatre.

4.1.3 New artistic expressions

The generative AI can create new forms of music and the art of musical theatre. It uses a huge amount of information about music to generate new scores, for example, the combination of classical music with electronic beats will be made in order to produce new types of music, which is an opportunity to use more instruments to compose the score. In the design of stages, artificial intelligence is used to come up with complex sets that are dynamic by creating a realistic simulation of various settings.[13] The design schemes are created according to themes and parameters so that they can be changed dynamically at any time. As an example, the AI would make futuristic cityscapes as part of the sci-fi musicals. To choreograph, AI has the ability to interpret the movement patterns in order to generate innovative sequences. It mixes the ballet and hip-hop genres to form a new style of dance and it also makes dancers learn new ways of moving. Through the use of AI, there is a possibility to tell a non-linear and interactive story where the plot line and the conclusion can be chosen by the audience. Generative AI may bring some changes in the artistic world of musical theatre

as the creation and performance process becomes more creative and active, and the art itself is renewed.

4.2 Operational Efficiency

AI simplifies the process of musical theatre production by saving time in scriptwriting, choreography and stage design by producing drafts, developing dance sequences, and generating 3D models. It lowers costs through reducing cycles, minimizing rehearsal costs, and avoiding waste with virtual simulations. AI also enhances scalability and flexibility to allow large-scale content creation, changes in scripts and casts, as well as real-time interactive experiences, and integrating across production stages for innovation and adaptation.

5. Challenges and Ethical Considerations

5.1 Technical Challenges

5.1.1 Limitations of current AI technologies

The use of generative AI is also limited in the technical sense within the artistic context such as in musical theatre. The greatest disadvantages are that it does not have real creativity, and it can only imitate the style of others without having any true originality or depth of feelings. Another disadvantage of AI is its inability to be contextualized and produce a result that fits into cultural, historical, or emotional contexts.[14] There is also a need to train and tune it which demands huge amount of high quality data and training. It may be hard to produce a good product, and there will be some errors in the music, lyrics, design etc. Finally, the interface and communication between human artists and the AI tools are not efficient enough, so they cannot work together efficiently, and the role of AI in the production of the musical theatre is not fully exploited.

5.1.2 Adaptation to artistic needs

BI can be used to adjust in musical theatre and this is a very complicated art form that involves music, drama, dance, and visual. AI does not have the ability to grasp its subtleties. The use of AI in composition of music has its benefits in creating technically sound music but cannot create emotionally rich and story-telling music. [15] Choreography: In case of choreography, the AI would be able to make dances mechanically right but it would not be able to tell the story with them. It is challenging to combine AI with the conventional ways of creative processes as the artists are reluctant to such changes. Moreover, training an AI system demands huge amounts of data, which should be heterogeneous, but gathering it is expensive. There will be no much AI output without sufficient information. However, there are still obstacles to overcome in order to revolutionize the musical theatre using AI technology, such as the development of new technologies, collaboration between artists and AI systems, and the willingness to embrace the novel forms of creativity.

5.1.3 User experience and interface design

The experience and interface of the generative AI in musical theatre is also an important factor, as it will determine the quality and effectiveness of the creative process. The problem with these AI tools is that they are complicated and uninviting to non-technical users, the design is not user-friendly enough to allow creative work, and there is no feedback system to be used when working on them. Enhancement of such areas will make the user-AI relationship more efficient and will result in better production of creativity.

5.2 Ethical and Social Issues

Generative AI makes authorship in musical theatre more difficult, as it is unclear who are the developers and users. The subjective consciousness of AI is absent, which causes originality issues because the learned data is combined, and this can result in homogenization. Copyrights are behind the times, and there should be clear rules on ownership of AI-generated content.

In the musical theatre, AI is a threat to the traditional jobs of composers and designers as it will open up new opportunities in the field of training and supervision of AI. The quality still requires human interaction. In spite of possible job losses over a short period of time, AI can offer new career opportunities, and therefore one must have an ability to work with AI.

Generative AI changes musical theatre culturally by bringing new artistic expressions and forms, but it also plays a dual role in preserving or diluting cultural heritage. Socially, it automates tasks but creates roles such as AI trainers, while personalizing the audience experience. Ethical issues include ownership, bias, and cultural diversity that need to be balanced with innovation.

6. Conclusion

6.1 Summary of Findings

6.1.1 Key insights

The research demonstrates that AI can enhance the creativity in musical theatre to a great extent by creating various musical components, which allows developing new styles and soundscapes. The human-AI cooperation improves creative processes, where AI provides ideas that artists can develop further, combining human imagination with computing power. In practice, AI simplifies the production of scripts, choreography, and stage design, minimizing the cost due to automation. Nevertheless, there are problems such as the inability of AI to reproduce human emotions at this point and ethical issues related to authorship and employment. On the whole, generative AI is an opportunity and challenge that should be focused on technical and ethical aspects to use it responsibly.

6.1.2 Implications for practice

Musical theatre performers, the music producers and the music teachers will be greatly affected by the use of generative AI. To artists, it is a source of inspiration to create new ideas and break free from the boundaries, as well as provide them with more time in making their creations and experimenting with other cultures in order to create something unique. With the help of AI, the cost of producing and designing the stage is reduced and can be automated. The teacher will also incorporate AI in teaching process to encourage creativity among students and introduce them to different styles to be ready to face changes in the industry.

6.1.3 Theoretical contributions

The research makes a theoretical contribution to AI and the arts by discussing the use of generative AI in musical theatre. It demonstrates how AI can be used to compose music, using data analysis and generating new scores, broadening creative options. In theatre, AI is used to improve storytelling and stage design, making production easier and more engaging with the audience. The study presents AI as a cooperative tool that supports human creativity, which assists artists in overcoming blocks and perfecting work. It also provides information on the application of generative AI to other forms of art, furthering the study of technology and art.

6.2 Future Directions

The future studies on generative AI in musical theatre should focus on the following issues: long-term impact of artistic practices, cross-cultural usage that combines various musical traditions, educational implications such as AI-enhanced teaching and ethical-social aspects concerning authenticity and inequalities.

It is possible to change the music theatre by AI. Generative models are used in composition where new scores are created and traditional and modern ones are mixed. In choreography, it can be done with the help of AI that studies the movements and creates sequences of the mood and tempo. [16]The design of the stage uses the artificial intelligence to create 3D images and light simulation to visualize creatively. Also, the VR/AR is being added to the experience of the audience in order to have an immersive environment. All in all, AI affects creation as well as performance and interaction.

The policy makers ought to develop definite copyright policies of AI generated content in order to determine ownership and protect interests. The industry players need to invest in training artists and technicians on the use of AI tools. The ethical guidelines must cover bias, job loss and cultural impacts. Financial rewards such as grants may encourage AI growth. It is necessary to cooperate internationally to exchange best practices and speed up the responsible adoption of AI.

References

[1] Alexandra Huang Kokina.Creative Artificial Intelligence for Music Theatre [J]. Performance Research,2024,29(6):

[2] Haixia Ma, Yan Zhang, Xin Shan, Xiaoxi Hu. Exploring the Impact of Artificial Intelligence on the Creativity Perception of Music Practitioners [J]. Journal of Intelligence,2025,13(4):

[3] Ma, Pengxiang, Cao, Kun. Exploring the Application and Development of Generative AI Music in Contemporary China[J]. Journal of International Social Science,2025,2(7):

[4] Ziqiu Zhuang, Xue Li. The influence of collaborative music creation supported by generative artificial intelligence on students creativity [J]. Frontiers in Psychology,2026,16

[5] Yue Liu. The Study of the Practical Way of Art and Music Education in the Age of Artificial Intelligence [J]. Artificial Intelligence Technology,2025,3(4):

[6]Yu Yu.A Creative Stage Performance in the Integration of Vocal Singing and Artificial

Intelligence[J].Applied Mathematics and Nonlinear Sciences,2025,10(1):
[7] Xu Tao. The Practical Value of Musical Theatre Art in College Music Education: An Initial Exploration [J]. Art and Performance Letters,2025,6(1):
[8] Jacob Holster. Augmenting Music Education through AI: Practical Applications of ChatGPT[J]. Music Educators Journal,2024,110(4):
[9] Meixi Liu. AIGC Enabling the Transformation and Upgrading of Theatre Arts Designs[J]. Frontiers in Computing and Intelligent Systems,2024,9(2):
[10] Jiaxiang Zheng, Moxi Cao, Chongbin Zhang. AI-based generation of guzheng music based on classical Chinese poetry: towards a new paradigm of creative practice in Chinese traditional Music[J]. Multimedia Systems,2025,31(6):
[11] Mikael Bagratuni, Patrick Muller, Patrick Planing. A study of the use of artificial intelligence to create music: An empirical research on how people accept it[J]. Computer in Human Behaviour Reports,2025,18.
[12] Guro von Germeten, David Fielder. Voice and Gender in Contemporary Musical Theater Education: An Exploratory Practice Study[J]. Voice and Speech Review,2026,20(1):
[13] Lijun Wei, Yuanyu Yu, Yuping Qin, Shuang Zhang. From Tools to Creators-A Survey on the Development and Application of Artificial Intelligence Music Generation [J]. Information,2025,16(8):
[14] Lee Cheng. The impact of generative AI on school music education: Challenges and recommendations [J]. Arts Education Policy Review,2025,126(4):
[15] Psyche Loui, Corinna Parrish, Xiaotong Eva Wu, Jethro Lee, Elizabeth Hellmuth Margulis.Sequence Generation and Evaluation: A Novel Assessment of Musical Creativity [J]. Creativity research journal,2024,38(1):
[16] Dan Wu. Design of an optimisation algorithm for musical performance informed by constructivist theory in musical theatre [J]. Applied Mathematics and Nonlinear Sciences,2025,10(1):

