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FAMILY NEURAL NETWORKS: PRESERVATION AND TRANSMISSION OF MUSICAL HERITAGE OF DYNASTIES

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Abstract

The article addresses the problem of preserving and transmitting the musical heritage of family dynasties in the context of digital transformation. The author proposes an innovative approach based on the use of family neural networks – technologies that integrate genealogical data, multimedia materials, and machine learning methods. Family neural networks are presented as a tool for creating digital archives, analyzing musical creativity, developing educational programs, and establishing virtual museums. Particular attention is given to ethical and legal aspects, including the protection of personal data and intellectual property. The article highlights the significance of family neural networks for strengthening intergenerational ties, preserving cultural identity, and promoting musical art. Recommendations for further research and practical applications of this technology are provided.

Keywords: *family neural networks, musical dynasties, cultural heritage, digital technologies, machine learning, artificial intelligence, digital archives, virtual museums, ethics*

Introduction

Musical dynasties, passing down unique knowledge, skills, and traditions from generation to generation, play a key role in preserving and developing musical culture. In the era of digitalization, when traditional methods of transmitting cultural heritage are becoming less effective, modern technologies such as artificial intelligence (AI) and machine learning (ML) open up new possibilities. Family neural networks, combining genealogical data, multimedia materials, and intelligent algorithms, represent an innovative approach to analyzing and preserving cultural heritage. In the context of musical

dynasties, such networks can become a powerful tool for creating digital archives, analyzing musical works, developing educational programs, and promoting creativity.

In the modern world, where technology is advancing at an incredible pace, information technology (IT) plays a key role in all areas of life, including art and culture. In particular, IT can become a powerful tool for preserving and developing musical dynasties, which are a unique cultural heritage. Information technology permeates all aspects of musical art, from the creation and performance of music to its distribution and consumption. Modern musical instruments and software allow

composers to create complex and original works using various techniques and effects. IT is used to create virtual concert venues, organize online broadcasts of performances, and create interactive musical installations. The internet and digital platforms enable musicians to share their work with a wide audience, bypassing traditional distribution channels. Streaming services and digital libraries provide access to a vast amount of musical works, allowing listeners to choose music according to their taste and create their own playlists.

Virtual neural networks (VNNs) are a special type of IT that mimics the functioning of the human brain. VNNs can learn from large volumes of data and solve complex tasks such as pattern recognition, information classification, and data generation. In musical art, VNNs can be used to analyze musical works, create new musical compositions, and train musicians. VNNs can identify patterns and features in musical creativity, analyze harmony, melody, and rhythm, and determine the authorship of works. Trained on music of a particular style or author, VNNs can generate new musical works that align with that style. VNNs can be used to create interactive educational programs that help young musicians master the technique of playing musical instruments, study music theory, and develop their creative abilities (Grigoryev V.YE., 2024).

Musical dynasties are a unique phenomenon where talent and skill are passed down from generation to generation (Tursunova G.A., 2019). Preserving and developing the traditions of musical dynasties is an important task, and IT and VNNs can assist in this. IT allows for the creation of digital archives containing information about members of the dynasty, their works, awards, and achievements. These archives can include audio and video recordings of performances, sheet music, photographs, letters, interviews, and other materials related to the musical activities of the dynasty. VNNs can be used to create interactive educational programs that help young musicians master the traditions and secrets of the musical dynasty's craft. Trained on the music of a particular dynasty, VNNs can generate new musical works that continue the family's traditions. IT and VNNs can be used to create multimedia projects

that tell the story of the musical dynasty to a wide audience.

Imagine a musical dynasty that has been creating unique musical instruments for several generations. Using IT, a digital archive can be created containing information about each instrument, its history, construction features, and sound. Using VNNs, an educational program can be developed to help young craftsmen master the secrets of making these instruments. Additionally, VNNs can be used to create new models of instruments that combine traditional craftsmanship with modern technology.

Thus, information technology and virtual neural networks play an important role in the modern world of art, particularly in musical art. They can be a powerful tool for preserving and developing musical dynasties, ensuring the transfer of knowledge and skills from generation to generation, creating new musical works, and promoting musical heritage.

The goal of this article is to explore the potential of family neural networks for preserving and transmitting musical heritage, as well as to discuss the ethical and legal issues associated with their use. All family dynasties have long passed down their knowledge and skills from generation to generation. These could be secrets of craftsmanship, medical knowledge, musical practice, artistic skills, and much more.

Family neural networks can become a powerful tool for preserving and transmitting this knowledge and skills, especially in cases where traditional methods of information transfer are difficult or impossible. Preserving a musical dynasty through a neural network takes on special significance, as it involves not only music but also the preservation of family history, traditions, and values.

Main Part

Family neural networks, as a technology capable of combining and analyzing vast amounts of data, represent a unique tool for preserving and developing cultural heritage, especially in the context of musical dynasties. In the modern world, where technology plays an increasingly important role, such systems can become a bridge between the past and the future, allowing not only for the preservation but also the revitalization of traditions that might otherwise be lost.

A family neural network is not just a set of algorithms but a kind of digital twin of a family or dynasty. It learns from data related to a specific family, including musical works, personal records, memories, interviews, photographs, and other materials that form the family's cultural code. In the case of musical dynasties, such as the Bach or Richter families, the neural network can become a repository not only of sheet music and recordings but also of emotions, style, and unique performance techniques that have been passed down through generations (Peter M., 1991). This allows for the creation of a digital "personality" of the dynasty, capable of not only storing information but also generating new knowledge based on accumulated experience.

One of the key functions of family neural networks is the preservation of cultural heritage. In a world where many traditions are being lost due to globalization and changing lifestyles, such technologies can be a lifeline for unique cultural phenomena. For example, in the case of musical dynasties, a neural network can analyze performance style, instrumental techniques, compositional features, and even the emotional aspect of music. This is especially important for cultures where learning occurs through oral tradition, as in the case of the "Ustoz-Shogird" principle in the East (Tursunova G. A., 2020). Here, the neural network can become a digital "mentor," passing down knowledge to younger generations while preserving not only technique but also the spirit of the tradition.

However, preservation is only one side of the coin. Family neural networks also open up new horizons for creativity. They can create new musical works in the style of a particular dynasty. Imagine a neural network trained on the works of the Bach family generating music that sounds as if it were composed by a member of that family. This is not mere imitation but a continuation of the tradition, offering modern musicians the opportunity to interact with the heritage of the past and create something new based on it. Such technologies can breathe new life into classical music, making it relevant for contemporary audiences.

The educational potential of family neural networks is also difficult to overestimate. They can form the basis for creating interactive educational programs that combine

traditional teaching methods with modern technology. For example, a virtual AI-based mentor can analyze a student's level and offer personalized exercises based on the techniques and style of a particular dynasty. This makes learning more effective and tailored to individual needs. Students can not only study theory but also "communicate" with digital versions of great musicians, receiving feedback and advice that would be impossible in a traditional learning system.

Digital archives and museums created based on family neural networks are another step toward popularizing cultural heritage. Virtual and augmented reality (VR and AR) technologies allow visitors to "immerse" themselves in the history of a musical dynasty. For instance, one can attend a virtual concert where works created by a neural network in the style of the dynasty are performed or explore archival materials in an interactive format. Such museums can be of interest not only to the descendants of musicians but also to a wide audience, promoting classical music and preserving cultural heritage.

However, the use of family neural networks raises a number of ethical and legal issues. First, it is necessary to ensure the protection of personal data, especially when it comes to living members of the dynasty. Second, it is important to consider copyright and intellectual property, particularly when using archival materials. Third, there is a risk of information manipulation, which requires the development of strict standards and protocols. For example, how can we be sure that music created by a neural network truly reflects the style of the dynasty and does not distort it? These issues require careful discussion and regulation.

Conclusion

It can be said that family neural networks represent a powerful tool for preserving and developing cultural heritage, especially in the context of musical dynasties. They allow not only for the preservation of unique traditions but also for the creation of new forms of art based on these traditions. However, their use is associated with a number of ethical and legal challenges that require careful consideration. In the future, such technologies may become an important part of cultural and ed-

educational infrastructure, promoting classical music and preserving cultural heritage for future generations.

Family neural networks are not just a technology but a new way of interacting with the past. They allow us not only to remember but also to continue traditions, cre-

ating something new based on them. This is especially important in a world where cultural heritage is often under threat. Family neural networks can become a bridge between generations, allowing us not only to preserve but also to revitalize the traditions that make us who we are.

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