Practical Application of Artificial Intelligence in the Construction of Ancient Fengshui Buildings

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Abstract. At present, artificial intelligence technology has affected many industries in the development of modern society, providing structural transformation opportunities for the sustainable innovation and development of traditional industries. The theoretical research on artificial intelligence technology and the guidance of architectural practice can be used by Fengshui building culture, as an important component in traditional Chinese. It not only plays a positive role in inheriting the excellent culture of Oriental architecture, but also has important significance in promoting the concept of natural harmony of human settlements and guiding the healthy life. The development of the theoretical and practical wisdom under the natural concept of human settlement in ancient China requires the interdisciplinary vision and technical support. Using the advanced technical advantages of big data and artificial intelligence can complete the database of building resources and the practical technology and can guide the current architectural styles, so as to produce the real situation of natural harmony of human settlements.

Keywords: Artificial Intelligence, Deep Learning, Fengshui Construction

1. Introduction

Nowadays, artificial intelligence has become an important breakthrough in the reform of traditional technology industry due to its improvement of work efficiency and expansion of application fields, and also provides structural transformation opportunities for the sustainable innovation and development of traditional industry. Moreover, for many traditional academic research fields, the use of artificial intelligence technology for discipline integration and crossover research has promoted the
effective combination of theory and practice in traditional research fields to a certain extent.

At present, there are few domestic and foreign researches on the combination and application of artificial intelligence in the construction of ancient Fengshui architecture. Research on scientific practice in landscape architecture from the perspective of theory; Housing research in the theoretical perspective of cultural anthropology; Research on the relationship among settlement transportation, building materials, land types and natural resources in the theory of cultural geography; Environmental behavior theory from the environmental determinism, interaction and mutual penetration of the integrity thoughts belong to study, although the domestic and foreign scholars have from the integrity and philosophy, the integrity and geography, the integrity and the environment, the integrity and building, the integrity and city, the integrity and residential valuable diversity study is made on several aspects, such as content, but using the artificial intelligence and Chinese ancient Fengshui study hardly.

This paper discusses this topic and thinks that Chinese architecture construction can make use of modern artificial intelligence and big data technology. It can not only carry on the collation, induction and analysis of the text material content of the construction of Fengshui architecture, but also the technical construction of the practical application system of Fengshui architecture can better guide the completion of realistic architectural planning, architectural design, architectural implementation and architectural operation. At this point, I propose to use the mature technical means of big data and artificial intelligence, on the basis of collecting, sorting and analyzing the database of Fengshui text, and try to find the common fulm between artificial intelligence and construction of Fengshui. Its advantage lies in grafting and interusing the advanced technology advantage of big data and artificial intelligence with the natural intelligence advantage of human habitation.

2. The relationship between AI technology and Fengshui construction

As the core discipline system of Chinese traditional architectural construction culture, Fengshui(or Fengshui) has a broadly Oriental cultural feature in the term of Architectural Narratology. In the two directions of both theoretical knowledge and practical field, it pays attention to the internal element of architecture, Spatial dialectical model, the relevance of human (body) / thing (Architecture) and the practicality of technical strategy. And for the systematical program of geographical space inspection, site selection, and city construction in the external environment of building and construction, it builds a "space" of the trinity of meaning (Yi), time and space—that is the explicit implicit and related differentiation logic in the perspective of architectural Narratology. It shows the "image of heaven and earth(Xiang Tian Fa Di), "four image theory (Si Xiang Li lun) ", "Yang-Yin hold (Fu Yin Bao Yang) ", " seyama surface-water (Bei Shan Mian Shui) ", "precious place gathering wind and water (Cang Feng Ju Qi) ",and “the basic elements of the landscape gene”in the construction environment of Big Environment, Medium Environment and Small Environment.[1]And it also shows the architectural style from color, orientation, scale of the basic elements of the landscape gene to the "one chain and one form" of the landscape gene, architecture and " Yin embraces Yang(Yin Yang Hu Bu)". Therefore, the main body of the relationship between Artificial Intelligence technology and Fengshui construction research is as follows: Artificial Intelligence is also a complex cross system discipline, and its cross compatibility has brought opportunities and possibilities for the research of Fengshui construction in ancient times. At the theoretical level, Artificial Intelligence mainly uses to sense the external natural
environment of building construction by using digital computer or intelligence controlled by digital computer to obtain relevant knowledge in the process of survey practice, so as to integrate the analysis function established by the expert database of Fengshui science. It is to continuously carry out the data collection, storage and scientific analysis process; it is to use the theory, method, technology and application system of intelligent Fengshui theatrical analysis to obtain the best results. At the practical level: Artificial Intelligence uses the artificial system constructed around intelligent activities including in-depth research and practical operation in the field of Fengshui theory of building ancient buildings, such as data collection in dangerous environment, ancient building model construction, etc.; it also includes the certain behavior process of the machine imitating human beings using the knowledge of Fengshui to complete the construction of ancient buildings, including building’s location, planning, design, and operation and maintenance. At present, for Fengshui construction, there are three methoddususing Artificial Intelligence technology.

2.1 Traditional programming methods
The traditional programming method is based on mathematical logic reasoning to simulate the behavior of human construction process. In the first stage, according to the traditional programming method of computer, with accurate mathematical model, physical model and statistical model, the dialectical thinking process of "seeking dragons and acupoints" of the past generations of Fengshui family is expressed in a fixed program. Under the guidance of the program or data, the computer executes the instructions one by one according to the pre-determined steps; in the second stage, the programming focuses on the discipline of Fengshui from the past generations of scholars’s Knowledge, the special calculation and reasoning methods of different schools of Fengshui, as well as the expression, processing and use of the Fengshui knowledge. The computer can make the reasoning process of the system under the guidance of the construction environment mode, which is suitable for solving the complex rather than numerical calculation problems in the observation process of Fengshui. The basic structure of this programming system includes: Fengshui knowledge database, inference engine, human-computer interface, knowledge acquisition and update. The knowledge of Fengshui stores the specific knowledge of Fengshui to solve problems; the inference engine can use the knowledge of Fengshui in the knowledge base and the survey information obtained from human-computer conversation, and make analysis report and implementation scheme for the site or building according to various reasoning strategies, control strategies and analysis strategies of Fengshui.

2.2 Fengshui machine learning
Fengshui's machine learning is an interdisciplinary subject involving statistics, system identification, approximation theory, neural network, optimization theory, computer science, brain science and many other fields. It studies how the computer simulates or realizes human's learning behavior of Fengshui, and grasps the ability of improving algorithm in early learning and investigation practice to acquire new knowledge or exploration of Fengshui to test skills, we need to reorganize the existing knowledge structure of the theoretical / practical knowledge of other Fengshui schools, and make it continuously improve its performance, making it the core of the application of Artificial Intelligence technology. The biggest difference between machine learning based on Fengshui data and traditional programming
method is that machine learning can simulate human perception ability, judge and analyze building construction scene. The observation and inspection data (ancient building samples) can find the rules and can use these rules to predict and predict the future public opinion data or unobservable public opinion data. According to the different learning mode, learning method and Fengshui algorithm, machine learning has different classification methods, mainly including decision tree, integrated learning, clustering algorithm, supervised learning, unsupervised learning, reinforcement learning, transfer learning, active learning and evolutionary learning. Fengshui machine learning algorithm needs to input a large number of experience data of Fengshui building construction, and summarize these experience data, form a model through the intelligent training of computer. And in the further mining of Fengshui data, it needs to deal with a large number of data to build more simple and useful models. As a specific application, the efficiency of the learning or reasoning algorithm of Fengshui machine learning is the spatial complexity and time complexity of Fengshui may be as important as the accuracy of its survey and prediction.

2.3 Deep learning method
Deep learning has been widely concerned by academia since 2006, and it has become an upsurge of Internet big data and Artificial Intelligence.[2] The realization of deep learning method is mainly through combining the hardware and software of Fengshui building construction, so as to make an in-depth analysis of the construction mode based on Fengshui building. The Artificial Intelligence processing unit (APU) at the hardware level performs large-scale synchronous processing algorithm through the SDK port combined with the software level, and obtains the characteristic attributes through the combination of high and low levels, so as to effectively discover the distribution characteristics of the survey data of Fengshui and integrate them. In 2006, Geoffrey, a professor at the University of Toronto and a leading player in machine learning, published a paper in Science: firstly, the multi hidden layer artificial neural network in deep learning has a strong feature learning ability, and the features acquired by learning have a more essential simulation of the collected data, which is conducive to the visual classification and sorting of the data; secondly, the difficulty of deep neural network in training can be initialized layer by layer (layer wise to overcome and correct effectively). It can be seen that deep learning can simulate the learning path of the human brain neural network, like thinking method of experts, to analyze and process the optimal decision-making. Deep learning can build a complex structure of Fengshui machine learning model and a large number of empirical training data to learn more useful features of Fengshui. It will eventually improve the accuracy of classification and prediction, and it will be able to form a complex architecture model that is an intelligent mechanism of means and purpose.

3. Application of Artificial Intelligence technology in Fengshui construction field
With the continuous development of modern technology, modern architecture industry has made full use of new technologies such as computer, network and artificial intelligence to bring huge productivity,[3] optimize the construction process, improve the production efficiency of the construction industry, and improve the level of information application and management of the construction industry. As an important part of Chinese traditional culture and Oriental architectural
wisdom, it is particularly important to utilize artificial intelligence technology to carry out double transformation and innovation in theory and practice.

3.1 Fengshui big data: the core foundation of intelligent Fengshui
Using computer information technology to differentiate into a lot of big data, feng shui feng shui characteristic of machine learning algorithm, and the powerful computation ability based on cloud computing technology elements can build awareness in the process of geomantic omen, connection, language, four artificial intelligence decision-making ability of intelligent system, the main experience is to integrity of knowledge construction of big data. The construction of ancient architecture under the guidance of Fengshui has a long history of thousands of years, and the accumulation of many Fengshui classics is the practical experience accumulated by the Chinese people in the construction of architecture for thousands of years. Therefore, how to datatize the vast Fengshui classics is the important work of current Fengshui intelligentization. To inherit the Fengshui knowledge system for thousands of years, it is necessary to dig the Fengshui knowledge map through data analysis, and the assistance of natural language processing and other technologies can optimize this process. By objectifying the data of "dragon, cave, sand, water and direction", the computer can analyze the visual record of the case information of Fengshui, and the cases the famous Fengshui experts did in the past dynasties. Based on the construction case data of Fengshui, the computer can also automatically analyze the rules and core inspection cases of Fengshui. The collation, storage and innovative practice of Fengshui data are not only conducive to the excavation and inheritance of the construction experience and knowledge of ancient Chinese Fengshui, but also conducive to the construction process under the guidance of the harmonious coexistence of "man and nature" in modern architectural practice.

3.2 Machine learning: an intelligent technical means of Fengshui
At present, most of the construction industry is dominated by western architectural theories, and relevant data are obtained through controlled experiment. And then experts use these theories to guide practice and get the test and correction in practice. Through controlled experiments and structured theories, they can learn and improve the typical production mode of architectural knowledge. In "gas", "yi", "li", "xiang", "number", "shu", six big cultural orientation as the ideological basis of the integrity system, people pay more attention to living environment. With the arrival of the era of big data and artificial intelligence, the fragmentary and empirical nature of knowledge is no longer a scientific problem. Big data transforms all the books and construction experience of Fengshui into data to form a mass of Fengshui big data. The personalized and fragmented Fengshui construction experience will have a scientific way of expression, and personal experience can also be transmitted and communicated with each other through data. With the continuous improvement of the algorithm, deep learning can imitate the way of thinking of human beings, stratify and classify the massive and complex data, and conclude and advance step by step[5] Deep learning is the ability to extract a general pattern from the raw data of a jumble of cases, and then continue to extract and increase.[6] Deep learning can be used in conjunction with the same simulated quantitative data of geographical environment for geomantic thinking. Therefore, deep learning will realize the reasonable unification of
scientific quantification and Oriental wisdom thinking, so as to conduct guidance, analysis and disposal of building construction under external and objective natural conditions.

3.3 Intelligent Fengshu: the future inheritance of intelligent Fengshu

As a representative of Chinese traditional culture, it has been criticized as pseudoscience for nearly a hundred years, mainly because it does not conform to the standard of modern science, that is, it lacks of logical deductive theory system, precise construction implementation method and falsification of results[6]. However, the thinking mode and scientific method contained in the system of Fengshui are exactly in line with the complex science facing human settlements. Artificial intelligence can not only learn and improve with the help of Fengshui big data, and discover the underlying empirical rules of Fengshui, but also continuously innovate and develop on the basis of human experience, so that Fengshui can make great progress in building construction and inherit and develop excellent traditional culture under the condition of intelligent new technology. Artificial intelligence is used for data mining and processing of Fengshui, and a variety of intelligent devices help locate and design modern buildings. With its powerful storage capacity, processing capacity and intelligent algorithm, Fengshui intelligent machine can quickly conduct search, comparison and analysis, and quickly judge the overall plan of building site selection, design, implementation and operation. The intelligent Fengshui will be integrated into the daily life and become the real guide to the future human habitation.

4. Conclusion

Actually, big data, artificial intelligence and the ancient Chinese Fengshui construction culture have a common ground, so this paper relies on the theory and practice of the architectural research and practical technology. In the discussion, the paper emphasizes the database construction of Fengshui resources in traditional programming methods, and the function and value of kanyu machine and the deep learning are discussed. From theory to practice, we will gradually develop the guidance and support of modern building’s site selection, design, implementation, operation and maintenance by using big data and intelligent technology.

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