Artificial Intelligence Landscape Design Application Based on University Management

Xinling Liu

Logistics department, Shandong University of Arts, Jinan, China

sdaulxl@163.com

Keywords: Market management; Artificial intelligence; Landscape design; Applied research

Abstract: With the continuous development of urban construction in China, landscape construction has become a basic project to enhance the taste of the city and improve the quality of life of residents. Before the construction of the landscape, using the market management concept, scientific design of the landscape has become a preliminary work to improve the quality of landscape construction. Therefore, the application of management and landscape design in colleges and universities is a trend. Strengthening the combination of landscape design and artificial intelligence from the management of colleges and universities is the key to improving urban landscape design. With the continuous expansion of the landscape design industry and the urgent need for technology, the landscape design industry, as an important pillar of the national economy, has begun to combine university management with artificial intelligence to promote the innovation and structural transformation of landscape design in university management. Bring changes in the form of industry and services. To improve the overall efficiency of decision making and design. Promote a virtuous cycle of the landscape design industry and complete industrial upgrading. This paper will analyze the artificial intelligence in landscape design under university management and explore how to apply artificial intelligence effectively in landscape design.

1. Introduction

Landscape design is the combination of art and technology to deal with the relationship between nature, landscape and human activities in a designated geographical area and transform the terrain to create a pleasing landscape [1-4]. Among them, the design of art depends on the designer's artistic design ability [5-8], but in practical engineering, art design and technical means can not be well combined, thus leading to a series of problems, from the usual concept In other words, intelligent landscape is the optimal combination of the four elements of landscape structure, system, service and management and the internal relationship between them [9-14], in order to provide a reasonable investment, convenient, fast, comfortable and safe environment [15]. Smart landscapes, like other smart solutions, are at the heart of computer science. Through the corresponding hardware and software such as sensors, information networks, and management systems, the computer calculates the collected data and proposes an optimized solution to achieve the desired goal of the administrator. As a basic project to improve the quality of life of residents, how landscape construction can be combined with artificial intelligence to create a harmonious atmosphere close to nature is the key to urban landscape design. Therefore, this paper will analyze the problems encountered by artificial intelligence in landscape design, and discuss how to effectively apply artificial intelligence in landscape design.

1.1 The Concept and Definition of Artificial Intelligence.

Many people associate it with robots when they hear artificial intelligence, but the concepts of the two are not the same. If we think of a robot as a person, artificial intelligence can be seen as its brain or central nervous system. Before analyzing artificial intelligence, we must first understand the concept of "smart". The word "intelligence" comes from Latin. From the literal meaning, it is the collection, collection, collection and selection. It is generally believed that intelligence is the

  DOI: 10.25236/icem.2019.011

ability of human beings to express through mental work in the activities of knowing the world and transforming the world, that is, human beings. Intelligence, that is, the individual's comprehensive ability to analyze, judge, and purposeful actions on objective things and effectively solve environmental problems. "Intelligence" can also be seen as "wisdom" and "ability", and the combination of the two has a meaning of intelligence. Although both human intelligence and artificial intelligence contain "intelligence", they cannot be equated. Human beings are different from artificial intelligence in that human beings have the subconscious mind. Artificial intelligence is an area of human intelligence research, from the initial mechanical automation of research and development. From electronic automation to information automation, this research work has gone through years and several generations of efforts. However, the current artificial intelligence is still in the stage of weak artificial intelligence. In fact, the most fundamental difference between strong and weak artificial intelligence is the processing of logical formation. Strong artificial intelligence completes a series of learning activities based on itself, and can actively acquire and not be active. Human constraints can develop independently; weak artificial intelligence is passively accepted, and tasks are passively performed according to the needs of the designed program.

1.2 Artificial Intelligence is not Accidental.

It has been developed through the accumulation of long-term philosophy, technology and art. It is not only the crystallization of human wisdom, but also an important tool for liberating human intelligence and physical strength. The usual system programming languages, such as C++, are used throughout the design of the program. They are powerful and efficient, but not easy to learn. The characteristics of the scripting language are: the grammar and structure are usually relatively simple; the learning and use is usually relatively simple; usually the "interpretation" of the program is easy to modify as the running mode, without the need to "compile"; the development capacity requirements of the program take precedence over Requirements for operational efficiency. Because the scripting language is easy to learn and use, it is widely used as the "secondary development" of traditional design software, and is therefore used as a parameterization function extension of traditional software. Almost any traditional drawing software can support one to several scripting languages. As shown in the Table 1 below:

Table 1 Traditional Drawing Software and Its Supported Scripting Language

Drawing software	Supported scripting languages
AutoCAD	AutoLisp,VBA,ARX(Using C++)
3dsMax	MaxScript
Rhinoceros	VBS(Visua lBasic Script)
Maya	MEL(Maya Embedded Language)
XSI	VBS(Visual Basic Script)

2. Problems in the Development of Intelligent Landscape

2.1 Single Function of Intelligent Application.

At present, some developers or manufacturers embedding a single function in the use of landscape, it is known as smart home, not to achieve multi-functional collaborative work.

2.2 Low Level of Intelligence.

Because of the short development time of intelligent landscape in China, many intelligent systems are imperfect and the technology is relatively weak. There are some congenital defects in the control system. For example, building automation system is widely used nowadays. Its automatic control system only has the ability of sequential logic judgement, can't self-adaptively learn, and can't make logical judgement. If the internal parameters of the landscape change, it must modify the control program or adjust the parameters manually, and because of the control system. The structure of the system is more complex, and maintenance is more difficult. Once problems

arise, the system is likely to face the risk of collapse.

2.3 Lack of Coordination Among Intelligent Systems.

The main control system and the sub-control system apply independent operation control method. Affected by technical factors, the two technologies operate independently and are disconnected from each other. The comprehensive self-control ability of the landscape is insufficient. The hardware equipment of each system is redundant, the interface of mutual control and communication is insufficient, the writing between systems is insufficient, and manual adjustment is needed in many cases. And different system control technologies require managers to fully understand, otherwise the system failure, managers are helpless. The proportion of development problems is shown in Figure 1.

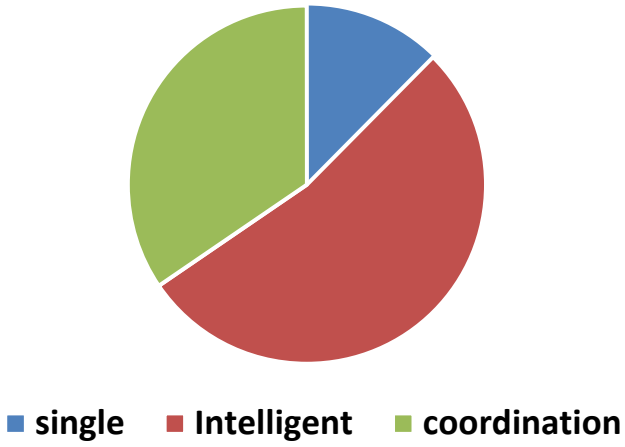

Figure 1. The proportion of development problems

3. Design of Intelligent Landscape System

The system simulates the various aspects of landscape planning and design by computer in accordance with the process of landscape planning and design. Each link can not only become an isolated link independently, but also dynamically influence the results of other links, facilitating the collaboration and handover of designers and reviewers in each link, and making the landscape design process iteratively modified. According to the general landscape planning and design process, the software is divided into the following subsystems as shown in Figure 2:

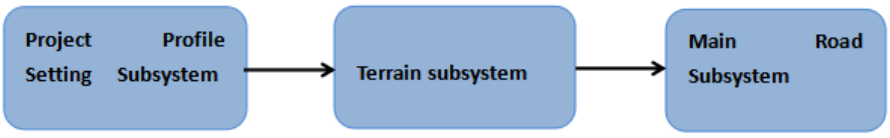

Figure 2. Diagram relationships of several subsystems

3.1 Project Outline Setting Subsystem.

The premise of computer modeling is to set up the basic rules of automatic project generation. After that, the collected information is input into the computer. The basic information needs to be input: construction scale, investment scale, sustainable development, service object, geographical location, temperature, light, monsoon direction and so on. These information will act as global parameters and affect the results of computer reasoning. Such as landscape area, landscape style, selection of vegetation flowers and so on.

3.2 Terrain Subsystem.

The goal of topographic subsystem is to output the topographic design map of the target landscape based on the input geological survey data and inference engine calculation. Firstly, the geological survey work needs to be handled manually, which can not be replaced by computer at present. The basis of survey work is divided into roughness in the early stage and fineness in the later stage. The rough purpose is to preliminarily evaluate or prepare the design draft for bidding. The less manpower input, the rougher survey data. Detailed purpose is to prepare construction drawings for the project construction, which requires detailed investigation of the entire site. Our software system can make a smooth transition between rough and fine data. After the rough data is input, the fine data is input again, and the system will refine and correct the design results automatically. The survey data needed to be input here include the base status map, contour map, hydrological distribution map, soil acid-alkali distribution map and so on, which are the input parameters of the reasoning engine. Then, the inference opportunity refers to the basic information input from the previous steps, including the construction scale, investment scale, whether sustainable development, service object, geographical location, temperature, light, monsoon direction, etc. At the same time, referring to the basic design criteria of general landscape and the design of other existing landscape, the preliminary model of terrain is deduced. We choose rule engine as reasoning engine. Rule engine originates from rule-based expert system, and rule-based expert system is one of the branches of expert system. Expert system belongs to the category of artificial intelligence. It imitates human reasoning, uses tentative methods to reasoning, and uses terminology that human can understand to explain and prove its reasoning conclusions. It can be used to separate business decision-making logic of business decision-maker and technology decision-making of application developer in application system, and put these business decisions in central database or other unified place, so that they can be dynamically managed and modified in operation, so as to provide effective technical support for enterprises to maintain flexibility and competitiveness. Simply put: Let the business logic of the program be processed through rule configuration.

3.3 Trunk Road Subsystem.

The goal of the trunk road subsystem is to generate terrain roads using the terrain subsystem to output terrain data. After the terrain design is completed, before starting other designs, you first need to design the road to avoid the simultaneous delineation of landscapes, gardens and trees.

The principle of landscape design is first and foremost the basic principles that landscape design should follow. First, the relationship between design awareness and service awareness should be interactive. Designers and customers should have sufficient communication. Second, designers should remember their responsibilities and create landscape design features according to local conditions. Third, landscape design should be combined with local realities, such as local environment, regional characteristics and humanities, as a basis for the breakthrough of landscape design; fourth, emphasize the organic balance of diversity and unity, try to landscape The overall order of presentation is integrated into the design and integrated into one. Fourth, the climatic factors should be fully considered. For example, the landscape design of Shenyang should take into account the cold and warm summer sun in Shenyang, the concentration of rain, and the short and windy characteristics in spring and autumn. To choose the type of plant in the landscape, in order to maximize the benefits of landscape design. Secondly, landscape design should also pay attention to the principle of plant matching. First, the specifications of the plants should be determined, and the plants of various specifications should be coordinated and combined with the geological conditions that the plants are adapted to. In general, the medium-sized and above-special arbor as one of the landscape architectures plays an important role in the landscape effect presented by the entire landscape. It should be placed first, then the small-sized plants are placed, ensuring that The details of the landscape landscape should be treated; secondly, the species type of the plant should be properly combined, and the proportion of the deciduous plants and the evergreen plants in the landscape should maintain a certain balance relationship. For plants such as flowers and leaves. The

color of the plexus should be well coordinated. Generally, the plant colors in the summer and the east are the main colors, and other colors are supplemented to ensure visual complementation.

4. Conclusion

With the further development of science and technology, various functions of artificial intelligence technology will be constantly improved. In the process of intelligent landscape development, in order to meet the needs of human activities, the application of artificial intelligence technology in intelligent landscape will be more and more. Whether it is expert system, decision support system or artificial neural network, each system will continue to improve and optimize in the further development of intelligent technology, promote the performance of intelligent landscape to be more superior, and ultimately constantly meet many higher-level needs of people, so as to achieve continuous improvement of the quality of human life. The application of artificial intelligence in landscape design should be based on the existing landscape foundation, to implement the scientific, ecological and low carbon requirements of landscape design, and to play the role of improving the quality of life of residents in urban construction of landscape design.

References

[1] Pitarch Y, Ienco D, Vintrou E, et al. Spatio-temporal data classification through multidimensional sequential patterns: Application to crop mapping in complex landscape[J]. Engineering Applications of Artificial Intelligence, 2015, 37:91-102.

[2] Fraser, Donald C. Artificial Intelligence Design Challenge[J]. Journal of Guidance, Control, and Dynamics, 1988, 11(5):385-385.

[3] Wei X. The application and development of artificial intelligence in smart clothing[J]. IOP Conference Series Materials Science and Engineering, 2018, 320.

[4] DOTY, Karl W. Multiple algorithm solution to the artificial intelligence design challenge[J]. Journal of Guidance, Control, and Dynamics, 1988, 11(5):397-402.

[5] Ghanem R, Du X, Thimmisetty C, et al. Homogeneous chaos basis adaptation for design optimization under uncertainty: Application to the oil well placement problem[J]. AI EDAM : Artificial Intelligence for Engineering Design, Analysis and Manufacturing, 2017, 31(3):12.

[6] de Araújo, Danilo R.B, Bastos-Filho C J A, Martins-Filho J F. An evolutionary approach with surrogate models and network science concepts to design optical networks[J]. Engineering Applications of Artificial Intelligence, 2015, 43:67-80.

[7] Xing L, Krupinski E A, Cai J. Artificial intelligence will soon change the landscape of medical physics research and practice[J]. Medical Physics, 2018, 45(5).

[8] Liang S, Hua S, Shuyang L, et al. Integrated Application of Eye Movement Analysis and Beauty Estimation in the Visual Landscape Quality Estimation of Urban Waterfront Park[J]. International Journal of Pattern Recognition and Artificial Intelligence, 2018, 32(09):1856010-.

[9] Petridis M. Research and development in intelligent systems XXXIII[J]. Journal of Development Studies, 2016, 32(2):175-194.

[10] Poteralski A, Szczepanik M . The application of artificial intelligence in the optimal design of mechanical systems [J]. IOP Conference Series: Materials Science and Engineering, 2016, 161(1):012040.

[11] Chen X, Hu X, Liu T Y, et al. Efficient Mechanism Design for Online Scheduling[J]. Journal of Artificial Intelligence Research, 2016, 56(1):429-461.

[12] Manwaring K, Clarke R. Surfing the third wave of computing: A framework for research into eObjects[J]. Computer Law & Security Review the International Journal of Technology Law &

Practice, 2015, 31(5):586-603.

[13] Coppedè, Fabio, Grossi E, Lopomo A, et al. Application of artificial neural networks to link genetic and environmental factors to DNA methylation in colorectal cancer[J]. Epigenomics, 2015, 7(2):175-186.

[14] Zatarain, Niebla J M. The role of automated technology in the creation of copyright works: the challenges of artificial intelligence[J]. International Review of Law, Computers & Technology, 2017, 31(1):91-104.

[15] Yazdani S, Shanbehzadeh J. Balanced Cartesian Genetic Programming via migration and opposition-based learning: application to symbolic regression[J]. Genetic Programming and Evolvable Machines, 2015, 16(2):133-150.