Artificial Intelligence Technology in Optical Fiber Communication Engineering

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Abstract. Optical fiber communication engineering as a kind of "wired" optical communication mode which uses light wave as carrier and optical fiber as transmission medium to transmit information from one place to another, especially optical fiber has a special position in the communication industry due to its unique advantages of wide transmission frequency band, high anti-interference and small signal attenuation. It has important practical value for the deep research of the area setting and protection of optical fiber and cable in the optical fiber communication engineering. However, at present, there is no complete management system in the aspects of hardware processing, fiber optic cable protection and the guarantee of the introduction of related talents, so it is urgent to innovate and develop the existing path. Based on this, this paper first analyzes the problems of optical fiber guarantee in the intelligent technology system construction of optical fiber technology in the field of communication engineering, and then puts forward the construction strategy of intelligent protection and breakthrough technology in optical fiber communication technology system.

Keywords: Artificial Intelligence, Communication Engineering, Optical Fiber

1. Introduction

After a long period of rapid growth, China's economy has entered a period of slowing down. China's economy urgently needs to prevent growth from stalling and maintain the growth rate at a moderate level. On the basis of this economic condition, the emergence of optical fiber has brought a key point of technological and energy breakthrough for China's communication industry. As an important way to guarantee all kinds of connections between economy and society, the construction of effective optical fiber communication engineering improvement system in the communication industry has important practical role and value [1]. And the project as a kind of light waves do carrier, optical fiber as transmission medium to transmit the information from one place to another place "wired" optical communication way, especially the smooth implementation of the national communications network safety, the industrial chain of its related technology development to promote the advance of the class project development and the progress of communication technology, intelligent and promoting the high-quality development of AI technology in China's communication field has great practical significance.
At present, there are still many problems and deficiencies in the construction level of intelligent optical fiber communication network system in China, which is embodied in the dislocation and disconnection between the existing optical fiber communication laying range, the upgrading of the laying environment in remote areas and the optical cable guarantee level and the actual demand of society and industry [2]. This dislocation and disconnection lead to the existing communication engineering in the implementation of optical fiber communication guarantee mechanism at the same time, there is still a transmission fault risk between the base stations. Therefore, optical fiber communication research personnel should be in the maintenance of optical fiber laying the scope of the process, especially all kinds of base station in the process of optical fiber transmission in laying, scarce area in the process of the construction of research should focus on from several aspects, as shown in Figure 1 to construct perfect communication network system in our country to lay a solid foundation.

![Figure 1. The focus of light wave information integrity protection system research](image)

In addition, the fiber type of information transmission technology as the base station information dissemination regions, and plays an important role in the building of the network technology, and different areas based on the transmission cable and the difference of base station signal reception, the emphasis of the communication is not the same, but these engineering point when technicians set to considering the wavelengths of light such as theoretical calculation formula is the same [3]. As shown in formula 1:

\[ V = \lambda \cdot f \]  

(1)

Based on this, the development level of the high-tech industry in the communication network of each region under the artificial intelligence technology has not been significantly improved, resulting in the intelligent improvement direction of the optical fiber communication system in each region gradually show the same trend, and it is difficult to make further technological breakthrough. In this context, as a development path based on the intelligent technology industry in the intelligent era, the exploration and research on the development path of various link networks of optical communication need to build a high-tech and benign cultivation system has important practical value.

2. Problems existing in optical fiber guarantee in intelligent technology system construction of optical fiber technology in communication engineering field

2.1. In the field of communication engineering, the practical dilemma of optical fiber guarantee in the intelligent technology system construction of optical fiber technology

First of all, communication, as one of the most technologically dynamic technologies in China, gathers sufficient production factors such as technology, talent and capital, and the absorption effect of communication development is very obvious. The current communication station in remote areas because of the difference of geographical location and environment, the development of the base station construction level not neat, in regional economic development level disparity is gradually increase, due to the government for the development of optical fiber communication cannot with corresponding protection, so as to lower the overall level of technical development, further...
intensifying the plight of the development of intelligent technology in this field. Secondly, the old industrial model in each region is facing the dilemma of being eliminated by the society, which is mainly manifested in the lack of labor resources and insufficient supply of land resources [4]. These problems lead to a decrease in the flow of people, which prevents the fiber optic technology from challenging more difficult conditions, and thus keeps it content with its current state. In addition, the development pace of the research system is slow, which is mainly reflected in the declining employment rate of graduates from universities such as electronic information technology and communication engineering. As a result, the proportion of new technical personnel introduced into optical fiber research and technology centers in various regions is greatly reduced, which objectively reduces the source and participation of fresh vitality of such technology research. The existing base station construction research talent knowledge reserve can not meet their own needs.

2.2. Practical problems of fiber optic guarantee in intelligent technology system construction of fiber optic technology in communication engineering field
The practical problems existing in the artificial intelligence technology construction system in communication are mainly reflected in the following aspects. First, with the continuous expansion of new technology development planning in various regions in China, the economic development of towns and villages is gradually uneven, resulting in the incomplete popularization of optical fiber communication. Secondly, there are prominent problems such as unclear positioning in the planning scheme of the cable laying plan formulated by the relevant government agencies, which leads to the lack of its own characteristics in the development system of communication AI technology, and further makes the artificial intelligence communication constructed by it without competitive advantage and position in the market [5]. In addition, the phenomenon of fiber optic cable loss in remote areas can not promote the operation of high-tech technology in the new era. Over time, a vicious circle has been formed, resulting in the long-term application of fiber optic communication in such areas. As a result, various regions cannot adapt to the development mode of the new communication technology era, which is not conducive to promoting its long-term, sustainable and stable development.

2.3. Thinking on problems existing in fiber optic guarantee in intelligent technology system construction of fiber optic technology in communication engineering field
At present, in the establishment, research and process of optical fiber communication network, too much attention is paid to the expansion of the scale, while ignoring the long-term development of fiber optic cable material and the construction of the protection mechanism of fiber optic cable, resulting in the lack of guarantee of the service life. Secondly, the current research direction of optical cable in the use and coupling technology ignores the capital characteristics of various social enterprises in pursuit of interests, resulting in the research of high-precision cutting technology can not be put into the market for large-scale use and production [6]. In addition, some communication centers lack a unified and correct understanding of the research and training objectives of technical personnel in the aspect of data security, and many fiber optic cable material researchers ignore the construction of basic capabilities, resulting in the development of technology is not ideal. The overall goal of the research and planning of optical cable radius is the lack of vitality and innovation in the technical breakthrough and the guarantee of various measures in the experimental stage and the in-depth research, which further restricts the rapid development of the efficient and level of the construction system of this kind of technology.

2.4. The in-depth study of communication technology and the training of corresponding technical personnel will promote the problem that the intelligent development of this kind of project does not match the demand of social industry
First of all, the system engineering of optical fiber communication in the construction of intelligent system lacks the embodiment and representation of innovative connotation, which leads to the neglect
of the profound observation and feeling of social and technical needs in its improvement concept. Moreover, due to the lack of innovation connotation, the optical fiber developed by the company cannot be linked with the actual social needs, and it is necessary to further study the material with higher cost performance [7]. Secondly, there is a lack of innovation in the training of relevant professional and technical personnel in universities. This lack of innovation is not only reflected in teaching methods, teaching objectives and teaching modes, but also reflected in the enhancement of students' main practice and ability, as well as the cultivation of students' independent thinking, practice and pioneering consciousness and ability. In addition, this kind of technology system in the monitoring, trial, put into the stage of product research and development, intelligent technology has not reached a certain height, here, should be in the pipeline to increase the application of intelligent, so that more energy can be put into the cable material research. These aspects together constitute the communication technology system in the development of intelligent technology and social needs do not match the root of the problem.

3. The construction strategy of intelligent protection and breakthrough technology in optical fiber communication technology system

3.1. Upgrade intelligent technology breakthrough trial in communication network
First of all, at the positioning level of AI technology trial corresponding to its project, the communication network should accurately locate the development goals and directions of optical fiber material and radius technology system application based on its own conditions and relevant development needs of society and industry. In the development and application of intelligent technology, it is not only necessary to set up multi-path light wave transmission mechanism, but also to improve the construction of operation mechanism of multiple intelligent detection networks in corresponding platforms. Second, it is necessary to speed up the improvement of the defects of optical fiber itself and cultivate the engineering practice ability of technical personnel, so as to improve their comprehensive quality in several aspects as shown in Figure 2 below[8-9]. In addition, the construction of the system with the application characteristics of this kind of technology in multi-angle technology research needs to cultivate and encourage the practical operation of technical personnel. By improving the innovation vitality of researchers, it can help this kind of system to establish efficient engineering concepts and improve the application characteristics of intelligent technology in optical fiber communication.

![Figure 2. Engineering practice capability application system of technological breakthrough](image)

3.2. Build a perfect optical fiber information transmission application network
In terms of the research of optical fiber materials, the concept of "green development" should be deepened, and the construction and reform of the industry should be promoted. For example, the role and function of modern information technology should be fully utilized and played, and the key points
to be strengthened should be considered and understood through the vivid and intuitive demonstration of Internet technology [10]. Secondly, the institute should carry out targeted communication technology optimization according to different regional climate conditions and local personalized needs, build a scientific and efficient development system, and carry out targeted improvement experiments according to the specific application situation of problems in transmission practice, so as to promote the common development of all regions. Third, to build up an objective and effective system of economic development, in view of the lack of funding support and economic level is not high problem areas in a timely manner and information feedback and iteration optimization, makes the corresponding treatment measures as soon as possible to enhance its positive construction and development, promote the intelligent levels continue to rise, guarantee in optical fiber communication industry and ultimately achieve the goal of construction of "comprehensive intelligence".

4. Conclusion

In short, in view of the current in the development of the technology of artificial intelligence in this kind of communication engineering system functions in the research of constructing level there are still many problems and shortcomings, the specific performance in optical fiber communication in laying late laying environment and remote areas to upgrade and cable protection level and the actual demand of social and industry dislocation and disconnectedness. In this paper, through the analysis of the problems in the construction of intelligent technology system of optical fiber technology in the field of communication engineering, the practical difficulties and the root of the problems of this kind of technology are studied. Then, in view of the intelligent maintenance technology in the field of technical skill application engineering aspects of the outstanding problems and the insufficiency, this article presents the intelligent protection, breakthrough technology in optical fiber communication technology system construction strategy, namely to promote the communication network intelligence technology through trial, build up perfect optical fiber information transmission network, so as to ensure the realization of the goal of intelligent construction of China's communication network system.

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