

## Intelligentization of Landscape Bamboo Buildings Based on Visual Data Transmission and 5G Communication

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### Abstract

*Based on intelligent visual information and 5G, this paper studies the intelligent visual communication of landscape bamboo buildings, and provides a new method of intelligent perception and interactive computing for the real world, which can represent, model, Perception and cognition; through the integration of virtual and real, the situational understanding of the human-machine-material fusion environment and the interaction with nature. The 5G network can well meet the combination of high-bandwidth uplink transmission and low-latency downlink control. At the same time, 5G-based AR intelligent inspection, remote operation and maintenance guidance, and machine vision inspection. Taking the bamboo building as an example, through field inspections to analyze tourism Bamboo buildings before and after development, and the intelligentization of bamboo buildings based on 5G and visual modeling.*

**Keywords:** Landscape Bamboo Buildings, Visual Data, 5G Communication

### 1. INTRODUCTION

In modern society, 90% of human information comes from audio and video. With the development of zero-degree-of-freedom-ultra-high-definition video technology, the three-degree-of-freedom presentation technology represented by "virtual reality" has gradually become a hot topic in academia and industry. In recent years, many companies and research institutions such as Samsung Electronics in South Korea, Apple in the United States, and Shanghai Jiaotong University in China have proposed the "visual communication" technology of six degrees of freedom in the International Moving Picture Experts Group (MPEG) standard organization. Since 2015, the State Council has successively issued a series of guiding documents such as "Made in China 2025", "Guiding Opinions of the State Council on Actively Promoting "Internet Plus" Actions," and "Guiding Opinions on Deepening "Internet Plus Advanced Manufacturing Industry" to Develop Industrial Internet"[1].

Today, 5G and industrial Internet, as important parts of new infrastructure construction, will help the transformation and upgrading of traditional industries, and promote the integrated development of industrialization and informatization on a wider, deeper and higher level. From the perspective of development traceability, as early as 1980, the country began to work on the reform of communication networks. Basically, new communication technologies appear every ten years, and these new technologies usually have higher spectral efficiency and bearing capacity. and use these technologies to promote the continuous development

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of other fields or innovative industries. So far, after 30 years of development, 4G network has been widely used in all walks of life around the world. In the business world, 4G network technology has effectively realized business informatization, and has played a role in solving dynamic data traffic problems and connecting more tools. important role. With the further development of network technology, 5G communication network technology has emerged as the times require.

Since 1980, from the first generation of dynamic communication business transformation to the present, dynamic communication technology can launch more advanced technology every 10 years, and use the import of important technologies to complete the multiple improvement of spectral efficiency and carrying capacity, and promote the continuous emergence of new types of operations. . At this stage, 4G technology is being used in large-scale commercial use in the world, as well as the connection of more tools to solve the increase of dynamic data traffic in the future, and the continuous emergence of new types of operations and utilization places. Under this situation, 5G technology should appear in the world. Compared with the previous technology, the difference is more in the form of utilization. Related elements such as peak rates, more reliability, and less transients become key elements of system planning. The research of perceptual psychology shows that the visual attention mechanism of primates can make use of limited information processing ability to efficiently extract interesting visual information from complex scenes. The research results of biophysical and neurophysiological mechanisms also show that this visual attention feature can help people pick out valuable parts or regions and objects of interest in an image [2].

The human visual system does not sample uniformly when processing external signals, but focuses on certain regions of interest (ROI) . Ethnic villages have always been a research hotspot of social science at home and abroad. The rise of the tourism industry has made ethnic villages a tourist attraction. The research focus of scholars. Due to differences in regions and cultures, foreign countries are more likely to refer to them as "communities", while domestically, they are more inclined to "village". In addition, there are differences in research content and research methods at home and abroad. In terms of research content, foreign community tourism is mainly about the participation of community tourism and community residents' perception of community tourism and the motivation of community tourism. This is to analyze the relationship between the host and the guest in the context of community tourism; the research method is mainly based on the combination of mathematical models and data analysis. Visual communication aims to use technologies such as accurate rendering of virtual scenes and objects, all-round perspective presentation, and real-time human-computer interaction [3]. It generates a visual perception environment that combines real and virtual, so that physical objects in the real world and digital objects in the virtual world can coexist and interact, providing users with an "immersive" experience that is not limited by time, region, and real conditions. At present, the key technology of visual communication is the key research content of the MPEG-Immersive (MPEG-I) standard, and it is also widely regarded as one of the most promising services carried by the 5G/6G mobile communication network.

## **2. THE PROPOSED METHODOLOGY**

### **2.1 Visual Data Transmission**

Emerging media such as 3D point cloud (3-Dimensional Point Cloud) and panoramic video are the main data types carried by visual communication. The big data load and high complexity of their generation, processing, transmission, rendering and other processes are bound to be related to the ultra-low time of visual communication. The demand for extension and strong interaction forms a sharp contradiction. Secondly, the latest research report of Samsung Electronics shows that the social media business centered on self-media has

occupied the first place in mobile applications. Visual data is no longer uniformly produced by content providers, and visual communication is gradually becoming the next explosion in the development of social media. Remote operation and maintenance guidance: Using "5G+AR" technology, remote experts can provide technical guidance to front-line staff, analyze fault types and solutions, ensure the accuracy of fault judgment and the timeliness of maintenance, and enable the repair and maintenance of on-site equipment on the production line. Become more efficient and convenient.

Machine vision inspection: Use 5G network combined with ultra-high-definition video to monitor product defects, seam gaps, etc., to achieve rapid transmission of inspection data, and to realize intelligent inspection of products through AI algorithms, improve product yield and improve production efficiency. Not long ago, South Korean Go players lost to "Alpha Go", the score between the two was 1:4. "The contest between people and intelligent systems has sparked the discussion of intelligence and future technology, and it has also become a hot topic of Internet celebrities [4]. "I think machines will be smarter than humans, but not more intelligent than humans. Wise. Ma Yun, a representative of the Internet, said that the characteristics of human beings compared with artificial intelligence are that

human beings have emotions, and machines are used for human beings. "This Go game is a milestone event in the history of artificial intelligence development." Kerberg believes that even if intelligence can choose information analysis methods in image, speech, language, etc., it cannot achieve infinite energy in terms of energy, and there will be great progress in the next 5 to 10 years. The region of interest is the area in the scene that can most arouse the user's interest and reflect the main content of the image. Therefore, the detection of the region of interest plays an important role in the field of image processing and analysis.

## 2.2 Visual Data Transmission and 5G Communication

The 5G network can not only effectively solve the problems of wired deployment of production lines, unstable network signals and interference, but also change the dependencies and connection modes between devices through wireless transmission and wireless control. Require. The industrial intelligent cloud system in this paper is a new architecture based on "cloud-pipe-terminal", which consists of acquisition terminal, industrial intelligent gateway, 5G network, MEC server, industrial cloud platform and trusted cloud platform. The local network in the factory and the transmission network outside the factory are effectively connected. Compared with the previous 3G network technology and 4G network technology, 5G network technology uses more forms, has a higher peak rate, and connects far more objects and locations than 4G network technology. Secondly, the impact of 5G network technology is extremely extensive. It has the function of assembly and can realize effective link and communication between machines. Therefore, it is widely used in the configuration of high-speed trains and subways.

$$H_c = w_c(a^t a + b^t b) + g(a + b) \quad (1)$$

$$Q(b) = \sum_{i=1}^n (y_i - b_0 - b_1 x_{i1})^2 \quad (2)$$

The current high-speed trains and subways can already provide high-definition video for all crew members and passengers, and can equip communication vehicles with realistic simulation tools and diversified high-end

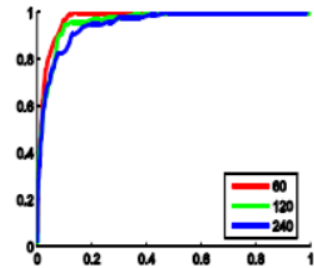


Figure 1. Visual Data Transmission

equipment. At present, among the many hot words, VR has already occupied a place, and the simple explanation is that this means completes "daydreaming" through computer users. During the implementation of this system, the VR method will virtualize a multi-dimensional virtual scene with high realism, and at the same time use human audio-visual to make users have a very realistic feeling. "2016 will become the era of transaction-level VR". Zuckerberg is very confident in the progress of VR. He said that his company will have more in-depth help with manufacturers of mobile communication equipment and virtual reality tools in 2015. VR uses virtualized peripheral conditions to give users Bringing extremely excellent use effects, it will create software related to smart mobile communication device applications in the future [5]. "There are many types of smart mobile communication device applications at present. Research on perceptual psychology shows that primates' visual attention mechanism can make their use limited. The information processing capability of the system efficiently extracts interesting visual information from complex scenes.

The human visual system does not sample uniformly when processing external signals, but focuses on certain regions of interest (ROI). The ROI is the area in the scene that can most arouse the user's interest and reflect the main content of the image.

### 2.3 Intelligentization of Landscape Bamboo Buildings Based on 5G Communication

At present, industrial data collection can be divided into automatic collection or integrated collection. It comes from various data sources such as sensors, controllers, and monitoring equipment. There are various data structures such as machine conditions, state parameters, environmental parameters, and material inventory. There are text, Various data types such as pictures, voice or video. Due to the existence of data with different data sources, data structures and data types in industrial scenarios, industrial intelligent gateways are required for protocol conversion and adaptation, data interaction and transmission to the cloud. 3G makes pattern design more complete and mature, and 4G technology effectively promotes With the advancement of video production technology, 5G network technology will vigorously speed up the network operation rate, establish ultra-broadband, promote the sound development of network technology, and optimize the allocation of network resources [6].

$$d_{\text{intersect}}(H_1, H_2) = \sum_t \min(H_2(i), H_1(i)) \quad (3)$$

$$H_{qd} = -(w_{qd} + \delta_{12})/b \quad (4)$$

For now, the impact of 5G communication technology on people's lives is mainly reflected in commercial applications. Commercial enterprises can use the 5G communication technology platform to conduct video communication with consumers and provide consumers with better services. Secondly, the mobile network supported by 5G communication technology can be closely integrated with intelligent cities, making electronic transactions more convenient, and at the same time, constantly improving the image delivery system. At present, big data is increasingly embedded in people's daily life. In the "Thirteenth Five-Year Plan" plan, the term has a total of 20 times. Good progress for the data enterprise. "The key to 'Internet +' is to use the value of information, and at the same time, to increase the speed of data socialization, use information as the key to create innovation and the engine of economic progress, and promote the national economy to a higher stage of development. Xishuangbanna is in a period of rapid development [7]. , brought a large number of tourists to the Dai Nationality Garden. During this period, the bamboo buildings in the Dai Nationality Garden began to change, and even the dry-storied buildings in the Dai Nationality Garden during this period were called "Dai-style Western-style buildings".

### 3. EXPERIMENT

5G communication as shown in the figure

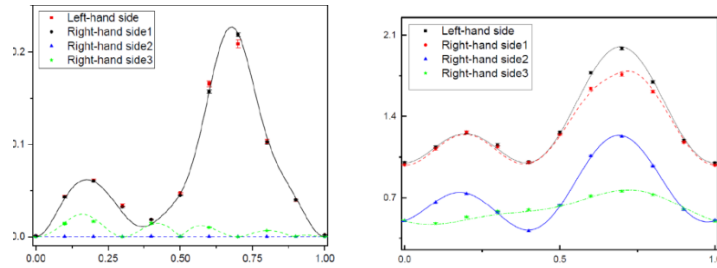


Figure 2. 5G Communication

The transmission of visual information is shown in the figure.

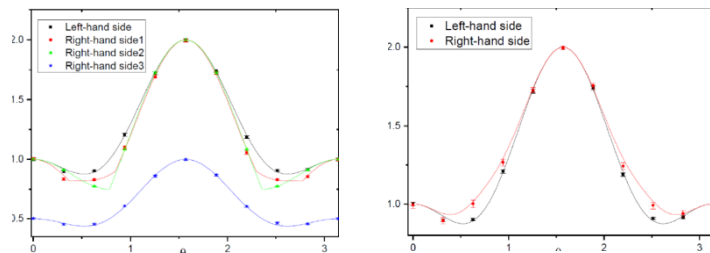


Figure 3. Visual Information

The upgrade of rural sports consumption based on cloud payment is shown in the figure.

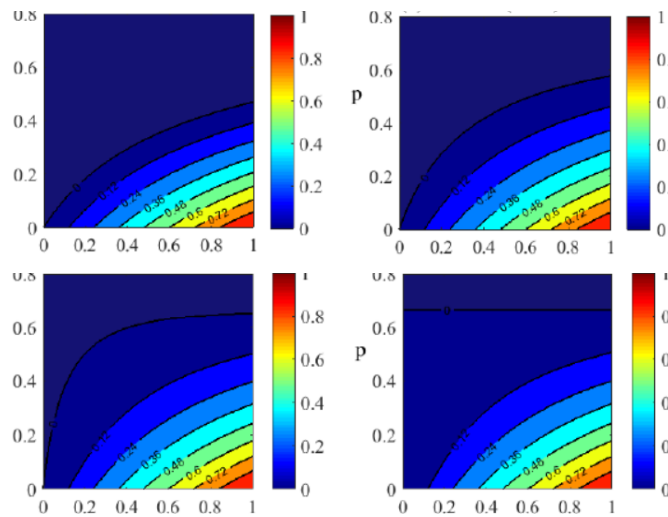


Figure 4. Rural sports consumption upgrade based on cloud payment

### 4. CONCLUSION

In this paper, from the aspects of system architecture, landscape bamboo buildings, etc., in-depth research and analysis of the bamboo building industrial intelligent cloud system, build a network environment to verify that the 5G network can meet the combination of high-bandwidth uplink transmission and low-latency

downlink control, and supports AR intelligent inspection, remote Integrated applications such as operation and maintenance guidance and machine vision detection make inspection standardized, operation and maintenance convenient, and inspection standardized. In remote sensing image compression, visual cognition theory can also play an important role.

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