Retraction

Retraction: Intelligent Control Optimization of Remote Transmission Quality of Communication Signals Based on 5G Network (J. Phys.: Conf. Ser. 2066 012031)

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The authors of the article have been given opportunity to present evidence that they were the original and genuine creators of the work, however at the time of publication of this notice, IOP Publishing has not received any response. IOP Publishing has analysed the article and agrees there are enough indicators to cause serious doubts over the legitimacy of the work and agree this article should be retracted. The authors are encouraged to contact IOP Publishing Limited if they have any comments on this retraction.

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Intelligent Control Optimization of Remote Transmission Quality of Communication Signals Based on 5G Network

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Abstract. With the rapid development of the information age, mobile communication networks have gradually entered people’s lives. The emergence of 5G networks has accelerated the convenience of people’s communication and contact, and has become an advanced information technology that has been widely used in various fields. Although the emergence of 5G networks is beneficial, the remote transmission quality of communication signals has also caused many problems. The optimization of remote transmission quality can effectively improve the operational stability of the communication network. There are many ways to optimize the transmission quality of communication signals. For example, when signal interference needs to be reduced, calculate the average value of signals in various places, set the interference reduction threshold function, and complete the remote transmission quality optimization of communication signals. The existing method is to use microblogs with hard and soft thresholds to decompose the signal quality through multiple scales to provide interference reduction thresholds, but ignore the calculation of the average value of the subband signals, so the signal transmission quality is optimized. The effect is not satisfactory. It is recommended to reduce the interference in the network communication process based on the anti-window. First, the input communication signal is Pulley converted, the frequency domain interference detection is performed on the communication signal, a low-pass prototype filter is formed, the average value of the signal in each place is calculated, the interference reduction threshold is set, and the network communication process is completed. The weakening of interference realizes the optimization of transmission quality. This article conducts research and discussion on the optimization of the long-distance transmission quality of the communication signal of the 5G network. Experimental research results show that by demonstrating the optimization of the quality of the 5G communication signal transmission process, these demonstrations can ensure the quality of the communication signal, and people's demand for the network is already indispensable.
Keywords: 5G Network, Communication Signal, Remote Transmission Quality Optimization, Intelligent Control

1. Introduction

Nowadays, with the formalization of information technology, computers are widely used in the construction of various industries and fields. People have learned to use computers to communicate with each other on the Internet and can exchange information all over the world. An indispensable part of people's lives, but the network is the carrier. The technology that truly realizes people's information exchange is network communication, and people have higher and higher requirements for the quality of communication signals. In the process of network communication, when pilots of similar strength appear in a specific area at the same time, interference will occur. Under the interference, the communication signal generated by the communication filter is very unstable, which has a serious impact on the quality of network communication [2]. At this time, during network communication, it is necessary to perform interference weakening. If actual interference attenuation is performed, compared with most interference attenuation methods, the absolute value of the signal cannot be calculated in the window, which reflects the interference attenuation in the network communication process [3]. In this case, optimizing the signal quality and weakening the interference in the network communication process is one of the main factors restricting the development of the computer communication field. This has attracted the attention of experts and scholars [4].

In the long-distance transmission of communication signals, the line must rely on specific media to complete the transmission action, and communication cables are the most important media [5]. The cable is physical, and it is affected by external personnel or non-human factors during the production process, and the transmission line has defects. If there is such a defect, the line will move toward the signal strength during operation, thereby weakening the situation.

The line connection problem should be analyzed from the following aspects. After the line is disconnected, irregular and discontinuous line connections will appear on the surface of the fuse connection, which will obviously harm the transmission of communication signals and induce signal transmission. The strength becomes weaker and the entire system is damaged [7]. Second, the dust in the air may also be absorbed on the surface of the circuit. After the single-sided fusion, the dust and impurities adhere to the single-sided, and it is inevitable that problems with the single-sided structure will not help the signal. Part of the transmission and signal cannot be transmitted smoothly due to the lack of its own strength due to impurities [8]. The third is that when installing the clip part of the heat shrinkable tube, the installation cannot be completed by the general method. When using charging cable technology to install lines, if inflation is not implemented in time, the federation will be sealed. When using non-expandable heat-shrinkable sleeves, the side ribs of the metal zipper and heat-shrinkable sleeves do not match during long-term work. When the temperature of the connecting part is too high, the metal chain will gradually shrink, causing the moisture problem of the joint [9]. The optimization of the remote transmission quality of 5G network communication signals is achieved through the study of these issues [10].

2. Algorithm establishment
2.1. 5G signal transmission algorithm

The unit impulse response of the signal is:

\[ H^{(k)}(\omega) = \beta_1(k)\sum_{l=1}^{k} \epsilon(\varphi-\varphi_k) \]  

(1)

Among them, is the frequency domain unit impulse response, is the interference factor of the M-th signal on the first subchannel, and \( \omega \) is the frequency domain unit impulse response delay on the l subchannel time.

It can be obtained from equation (1) that the frequency domain form of the obtained signal can be expressed as:

\[ H^{(M)}(\omega) = S(\omega)H^{(M)}(\omega) + L^{(M)}(\omega) \]  

(2)

The original signal \( s(t) \) is in the form:

\[ s(t) = b_j\sum_{i=1}^{\infty} A(t-iT_s-jT_c)a_i \]  

(3)

Through formula (2), we can know:

\[ Y^{(M)}(\omega) = L^{(M)}(\omega) + \sum_{l=1}^{M} \beta_1(M)e^{-j\omega l} \]  

(4)

According to formula (1), it can be seen that the network channel supports up to M signals for transmission in the frequency domain of the node sending signals, and the dispersion coefficient \( \omega \) can be written as:

\[ \omega = \frac{2\pi}{M} \]  

(5)

After discretizing the M signals of equation (4), the signal to be transmitted can be obtained as:

\[ Y^{(M)}(\omega_M) = L^{(M)}(\omega_M) + S(\omega)\sum_{l=1}^{M} \beta_1(M)e^{-j\omega_M l} \]  

(6)

For wireless network channel transmission, vector processing is required. Therefore, formula (6) can be further vectorized:

\[ Y_M = L_M + \beta_mF_{\omega}s \]  

\[ L_m = [L^{(M)}(\omega_1), L^{(M)}(\omega_2), \ldots, L^{(M)}(\omega_M)]^T \]  

(7)

(8)

2.2. Solve the problem of bending of communication lines

Through research and analysis, if the current line bending radius does not exceed the specified range, the line bending has the least impact on the transmission speed. This provides us with clear setup specifications. In other words, in the construction process, try to adjust the bending force of the cable according to the relevant specifications. But in fact, when the bending radius of the cable does not reach the bending loss limit, the cable bending cannot be completely avoided, such as cold bending and fastening. Therefore, in the actual construction process, in order to avoid reducing signal loss, this situation must be avoided.
2.3. Start optimization before the cable is used

In order to reduce the possible impact of the signal transmission process, not only can a variety of structural measures be taken during the construction process, but also there are optimization measures for line use in the actual operation process. Related manpower can improve the original characteristics of the line and reduce losses. For example, in the opening inspection process, the inspection equipment is used to test the lines one by one, to maximize the screening of the problematic lines, and to find the defective or short-circuit lines as soon as possible.

2.4. Introduce advanced connection technology

In the communication signal transmission process, the core points of connection related technologies are as follows. One is that during the cable connection process, the connection index exceeds the standard. Pay attention to the inevitable situation during the connection process. For example, if there are errors in the geometric size, diameter, and other related parameters of the line, it will affect the subsequent line operations. When such a connection failure occurs, the main reason for the accelerated signal loss is the quality of the connected device. According to the performance and status of the connected device, it is determined whether the connection loss value can be controlled. The use of accurate and reliable machines can prevent interference joint loss caused by geometrical size, diameter error and other reasons to the greatest extent. Second, in the process of cable cutting, if the section has a large inclination or defect, the signal loss of the line will also accelerate. Therefore, in the cut-off project, only continuous standardized operation methods and the use of high-quality separation equipment can effectively reduce the loss of communication signals. In the process of line connection, the staff should accept it carefully and confirm whether the line part is concise. In addition, in order to prevent severe wear, the cleanliness of the operating environment must be improved. Before the start of the project, various tools such as electric fans, tents and generators should be reasonably organized in advance, and arranged in the correct positions, and the cutting tools and circuit parts should be cleaned in advance. The third and very important step is that the technical level of the technicians in the garment connection must be excellent, which of course helps reduce losses.

3. Modeling method

When optimizing the transmission quality performance of the network communication signal, the first step is to reduce the interference of the communication signal, improve the processing of the computer communication signal including the interference, and provide a state space for the received signal. Get the sample value of the received signal sample, and get the background noise and other interference. In the basic communication process of the network communication process, the dispersion of the system provides important value for reducing interference. The specific weakening steps are as follows.

\[
R_{ert} = \frac{p_{dg} \pm d_{gh}}{s_{ig}} \Theta (l_{top} \times s_{dg})
\]  

(9)

Then use equation (10) to calculate the communication signal processed by the communication filter under interference.

\[
y_{dggh} = \frac{k_{dg} \pm l_{gh}}{p_{ghh}} \Theta \xi_{sfg}
\]  

(10)
Then use equation (11) to give the state space of the received signal.

\[ k_{jip} = \frac{k_{wegp} \cdot v_{ji}}{\rho_{jip}} \cdot \frac{k_{adlp}}{\epsilon_{jlp}(p)} \times y_{dgh} \]  

(11)

Using equation (12) to get the sample value of the received signal sampling:

\[ W_{s_{ert}} = \frac{s_{w_{ert}} \cdot \chi_{s_{ert}}}{\zeta_{opt} \cdot \sigma_{p}} \pm p_{fgh} \]  

(12)

Obtain the variance of the sum of background noise and interference residue as:

\[ R_{we} = \frac{\phi_{w_{e}} \cdot \phi_{io}}{\rho_{p}} \pm s_{y} \]  

(13)

Use equation (14) to give the interference weakening threshold in the communication process.

\[ R_{we} = \frac{\epsilon_{we} \cdot \chi_{opt}}{\chi_{s_{ert}}} \cdot k_{dpp} \pm \theta_{d} \]  

(14)

\[ l_{kio} = \frac{\omega_{s_{ert}} \cdot R_{s_{ert}} \cdot k_{i}}{y_{h}} \cdot W_{s_{ert}} \cdot R_{wer} \cdot R_{wegp} \]  

(15)

4. Evaluation results and research

By exploring the optimization of the remote quality of the communication signal of the 5G network, it is found that the quality of the signal transmission has several aspects, which can be known by investigating the situation in several places.

Table 1. Factors affecting the quality of long-distance transmission of communication signals

| Region          | Weather factor | Technical factors | Material factors | Uncertainties |
|-----------------|----------------|-------------------|------------------|---------------|
| Northern region | 65%            | 10%               | 20%              | 5%            |
| Central Region  | 20%            | 40%               | 30%              | 10%           |
| Southern region | 10%            | 50%               | 23%              | 17%           |
| Western Region  | 30%            | 60%               | 5%               | 5%            |

It can be known from Table 1 that various regions of our country are affected by some factors. For example, because of the severe cold in the northern region, it may freeze the line and hinder the transmission quality. The western region, because it is in a remote location, is more affected by technical factors, while other regions are not much different. Therefore, with the further development of the times, the important role of communication technology in various fields is constantly improving. In the face of signal attenuation problems in communication signals, it is necessary to analyze the reasons, pay attention and pay attention to understanding, so that reasonable and effective optimization methods can be adopted, and then cooperate with continuous improvement in process design and inspection of construction quality to properly solve the communication transmission signal attenuation problem makes the communication transmission more smooth and efficient.
From Figure 1, we can know that after optimization, the transmission quality rate of communication signals in various places has increased a lot, so we should strengthen the rectification of communication lines in various regions, and strictly control the materials of the lines and strengthen the technology. The training ability of personnel and the focus on some areas affected by the weather.

From the data in Figure 2, we can know that most areas need line optimization to strengthen the problem of communication signal transmission quality, because now the information age is in need of the network, and the existence of the network is already indispensable. In recent years, our country has also continuously increased its research on communication technology and made targeted strategic deployment. At present, with the continuous expansion of the application scope of communication optical fiber, the problem of signal attenuation has become the focus of attention. For large-area communication optical fiber laying, it is necessary to consider problems such as poor communication and interruption caused by signal attenuation. Therefore, for the communication technology team, the source of signal transmission problems is very complicated. To solve these problems, the relevant personnel must have professional knowledge and skills, and they must also develop careful thinking.
skills in order to truly solve the problems. The optimization of the long-distance transmission quality of the communication signal of the 5G network has been greatly improved.

5. Conclusion

With the rapid development of modern society, people and the network have become closely integrated. In the current information age, it is impossible for humans to discard the network, and the problem of the quality of network communication signal transmission has already appeared in people’s sight. The optimization problem of signal transmission quality is waiting for us to solve. With the emergence of 5G networks in recent years, although the emergence of 5G networks has brought more convenience to people, people’s requirements for technologies to prevent the quality of communication signal transmission are gradually increasing, and the problem of communication signal quality attenuation also requires attention and solve. Nowadays, communication has become the main means of information transmission in society and is widely used in daily life. Therefore, it is very important to study the quality of communication signals in long-distance transmission. When sending communication signals, there are many factors that affect the quality of information, such as environmental reasons and human reasons. Therefore, from the discussion in this article, we can know that we should increase our research efforts, and then formulate some scientific solutions to these problems, to minimize the consumption of communication signal transmission quality, and take measures to optimize the communication signal quality according to the actual situation.

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