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Application of Digital Signal Processing Technology in Electronic Information Engineering

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Abstract:

With the continuous development of the social economy, people have put forward higher requirements for improving the application level of digital signal processing technology in electronic information engineering. This needs to be combined with actual work, fully utilize the advantages of digital signal processing technology, and carry out targeted innovation and optimization, thereby improving the application level of digital signal processing technology. Based on this, this article starts with the application principles of digital signal processing technology, analyzes the status quo of its application in electronic information engineering, and proposes corresponding improvement suggestions.

Keywords:

Electronic information engineering
Digital signal
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1. Introduction

With the development of the social economy, science and technology are also constantly advancing. As a new type of electronic information technology, digital signal processing technology can provide effective support for the development of electronic information engineering. Digital signal processing technology mainly combines various devices such as computers, digital circuits, microprocessors, data storage devices, and displays to form a complete electronic information system. Digital signal processing technology can be seen as a process of collecting, transmitting, and storing information. At the same time, digital signal processing technology can effectively improve the transmission efficiency and accuracy of data information in electronic information engineering, and reduce transmission costs.

2. Application principles of digital signal processing technology

2.1. Systematicity

In practical applications, digital signal processing

technology can divide the system into several subsystems according to the actual situation, and these subsystems interact and restrict each other to ensure the overall function of the system. Firstly, sampling and quantization of signals are performed. To ensure the performance of the digital signal processing system, processes such as sampling, quantization, and encoding must be carried out, which requires the signal acquisition system to have good data acquisition capabilities. Secondly, appropriate processing algorithms are selected. Digital signal processing technology needs to have good processing algorithms to achieve the desired functionality, and different algorithms can have different impacts on system performance.

2.2. Practicality

In the process of digital signal processing, it is necessary to ensure that it can better serve electronic information engineering, which means ensuring that digital signal processing technology can meet the actual needs of the development of electronic information engineering. From the perspective of practical application, the application of digital signal processing technology cannot be limited to simple numerical calculations and analysis, but should further develop the multiple functions of digital signal processing technology in electronic information engineering to provide a more comprehensive guarantee for the construction of electronic information engineering. Specifically, in the process of applying digital signal processing technology, continuous optimization and innovation of digital signal processing technology are needed to ensure that it can better serve electronic information engineering [1].

3. Problems in the application of digital signal processing technology

3.1. Lack of specialized operational talent

Electronic information engineering is a comprehensive project that involves many technical aspects. Only by ensuring the introduction and use of high-quality talent can the efficiency of electronic information engineering be improved. The current lack of professional talent is the main reason for the problems in the application of digital signal processing technology in electronic information engineering. Therefore, in the practical application of digital signal processing technology, it is necessary to introduce professional talent to ensure that digital signal processing technology is fully applied in electronic information engineering.

3.2. Lack of a complete supervision mechanism

Currently, many enterprises lack an effective supervision mechanism for the application of digital signal processing technology. The existing supervision mechanism cannot fully reflect the current status of digital signal processing technology applications, nor can it comprehensively address the problems that arise during the application process. In electronic information engineering, digital signal processing technology has certain specificities, and many problems may arise during its specific application. For example, when using this technology for electronic information engineering design, if the designer does not strictly follow the corresponding design specifications, it may lead to failures in the entire system operation [2].

3.3. Lack of optimization and upgrading of equipment

Digital signal processing technology has very strong computing capabilities, but there are also some problems that lead to poor application results. For example, in practical applications, data loss may occur. Due to the strong computing capabilities of digital signal processing technology in data acquisition, data transmission, data processing, etc., if data loss occurs during the data acquisition process, it will affect the normal operation of electronic information engineering. To solve this problem, it is necessary to optimize and upgrade digital signal processing technology to improve its computing capabilities.

3.4. Lack of effective integration of digital signal processing technology into other technologies

Digital signal processing technology has strong computing capabilities, but there is also a problem of not being able to effectively integrate with other technologies. For example, in the process of image processing and communication, signal interference often occurs, which can affect image quality if not resolved.

4. Application strategies of digital signal processing technology in electronic information engineering

4.1. Establishing a complete data system

Electronic information engineering is a vast system, and only by summarizing and organizing these data in a reasonable way can the system operate normally. The application of digital signal processing technology in electronic information engineering must establish a sound data system because the application of digital signal processing technology cannot be separated from the data system. When establishing the data system, it should be designed according to actual needs, first considering safety, stability, reliability, and other aspects. Secondly, when establishing the data system, the security of data should be ensured, such as data transmission, storage, management, and other aspects, to ensure the security and reliability of data and avoid impacts caused by environmental factors.

4.2. Strengthening training for relevant personnel

The application of digital signal processing technology plays an important role in electronic information engineering. Therefore, relevant enterprises need to train their staff to ensure they master the relevant knowledge of digital signal processing technology. Electronic information engineering is a highly comprehensive task that requires the participation of personnel with different professional backgrounds in practical work, which requires enterprises to strengthen training for relevant personnel. Enterprises need to provide professional knowledge training to their staff, allowing them to understand the important role of digital signal processing technology in electronic information engineering, recognize the technical content and methods they should master in practical work, and strive to learn professional knowledge.

4.3. Focusing on innovative technology application methods

In electronic information engineering, digital signal processing technology has broad development prospects. Applying digital signal processing technology to electronic information engineering can bring more efficient development to enterprises. Enterprises should actively introduce advanced digital signal processing technology, conduct practical operations in electronic information engineering, timely identify problems, and resolve them. For example, in practical work, it is necessary to fully consider the actual application of digital signal processing technology, reasonably choose application methods, and improve the application level of digital signal processing technology in electronic information engineering.

4.4. Strengthening the protection of information resources

In electronic information engineering, the application and development of digital signal processing technology cannot be separated from the protection of information resources. Therefore, when applying digital signal processing technology in electronic information engineering, it is important to focus on protecting information resources. In the information transmission system, attention should be paid to protecting signals, optimizing the design of transmission lines, and introducing digital signal processing technology to improve transmission quality and efficiency.

5. Conclusion

In summary, digital signal processing technology in electronic information engineering exhibits many advantages, such as high precision, strong reliability, high efficiency, and low development cost. However, due to certain defects in its own development and application, continuous innovation and optimization are still needed in practical applications. Digital signal processing technology can improve the quality and efficiency of electronic information engineering. To apply digital signal processing technology to electronic information engineering in practical applications, it is necessary to fully understand the specific applications of digital signal processing technology and strengthen the supervision and management of its application process. Only by continuously strengthening the supervision and management of the application of digital signal processing technology in electronic information engineering can we better leverage the advantages of digital signal processing technology and provide support for its development in electronic information engineering.

Disclosure statement

The authors declare no conflict of interest.

References

[1] Gu T, 2023, Discussion on the Application of Digital Signal Processing Technology in Electronic Information Engineering. Digital Technology and Applications, (3): 20–22.

[2] Zeng H, 2022, Research on the Application of Digital Signal Processing Technology in Electronic Information Engineering. Electronics Quality, (9): 81–84.