

Research on Information Security of Computer Networks in Universities based on Artificial Intelligence

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Abstract: Based on artificial intelligence technology, this paper analyzes the problem of computer network information security in colleges and universities. Combined with the characteristics and advantages of artificial intelligence technology, it puts forward measures such as establishing a perfect security awareness education system, strengthening the security protection ability of network equipment and systems, and strengthening the monitoring and early warning of network attacks, in order to improve the level of information security of computer networks in colleges and universities, and it is hoped that this paper can provide certain references for colleges and universities.

Keywords: Artificial Intelligence; Universities; Computer Networks; Information Security

1. Introduction

Computer network in colleges and universities has become an important tool for teaching, research and management in colleges and universities. With the rapid development of artificial intelligence technology, the research on information security of college computer network based on artificial intelligence is getting more and more attention. Artificial intelligence technology has the characteristics of autonomous learning, intelligent reasoning, adaptive optimization, etc., and plays an important role in college computer network information security. The problem of computer network information security in colleges and universities is becoming more and more prominent, which not only seriously affects the normal operation of the informationization construction of colleges and universities, but also poses a great threat to the personal privacy and property security of teachers and students in colleges and universities.

At the twentieth National Congress of the Communist Party of China, General Secretary

Xi Jinping said that education, science and technology, and human resources are fundamental and strategic supports for building a modern socialist country in all aspects. President Xi's important speech suggested that all three are fundamental supports for building the country. The combination of science and technology and education is a sign of the information age, under traditional education, with the rapid development of the field of education, artificial intelligence has a greater impact on the field of computer network information security in colleges and universities and revelation, this technology gradually appeared in the vision of teachers.

First, the importance of information security of computer networks in colleges and universities. With the rapid development of computer technology and Internet technology, computer network has become an important means and way of teaching, research and management in colleges and universities, which often plays a role in protecting the normal operation of various information systems in colleges and universities. The computer network in colleges and universities involves a number of fields, including online and offline learning of students, teaching and scientific research of teachers, and the backstage management of school administrators and logistical staff. For example, the emergence of artificial intelligence can make it an important learning partner for students, promote the cultivation of students' divergent thinking, creative thinking and critical thinking, and provide a broader space for students' thinking. Good education is more than just 45 minutes in the classroom, and after school is also a good opportunity to enhance students' knowledge. With the emergence of AI, AI with a large knowledge base is usually able to accurately answer questions posed by students, and can stimulate students' interest in exploring knowledge.

Maintaining national security and social stability, the university computer network is also one of

the country's important information infrastructures, carrying the country's important military, scientific and technological, economic and other aspects of information. If the information security of university computer network is not effectively guaranteed, it will pose a serious threat to national security and social stability, affect the normal operation of university teaching, research and management, and even cause serious damage to the reputation and image of the university. Protecting the personal privacy and property security of teachers and students in colleges and universities, a large amount of important private information is stored in the computer network of colleges and universities, which involves objects including students, parents, teachers, etc., such as the family information of students, the scientific research data of the faculty and staff, and the management of the salary of the personnel by the logistics staff. In the use of artificial intelligence, if there is no good network protection, once the relevant data is stolen by hackers for illegal transactions, it will cause great risks to the privacy and property security of college teachers and students.

2. Problems Arising from Information Security of Computer Networks in Higher Education

The problem of information leakage in college computer networks is one of the major threats to information security in colleges and universities at present. Due to the complexity and openness of the computer network system in colleges and universities, there is a risk of information leakage, first of all, this will be a great threat to the personal data privacy and property security of teachers and students in colleges and universities. Hacker attacks often occur in colleges and universities, hacker attacks will not only invade the college network to cause the interruption of daily network use, but also lead to the interruption of college teaching, scientific research and management, which will have a serious impact on the normal operation of the informationization construction of colleges and universities; secondly, there are certain problems with the management and maintenance of the computer network system in colleges and universities. Some colleges and universities may not have specialized information security team, lack of professional technicians for management and maintenance, resulting in the security of

computer network systems in colleges and universities can not be guaranteed; furthermore, such as artificial intelligence generally exists in intellectual property rights infringement, generation of false information, algorithms, "black box", privacy leakage and other controversies. For example, the privacy of educational data due to networking and other reasons, there will be privacy leakage and infringement of rights and interests, educational data, if abused, will cause harm to students in the compulsory education stage, so students need to protect the data privacy of teachers and students when using such tools; Finally, the emergence of artificial intelligence reduces the cost of cheating and academic misconduct, which may lead to a series of integrity crisis. Students will use it to write essays on their behalf, disrupting the normal order of classroom instruction and triggering a crisis of trust in the teacher-student relationship, and when discovered, teachers will question the authenticity of every assignment thereafter for no apparent reason.

3. The Solution Countermeasures of Computer Network Information Security in Colleges and Universities Based on Artificial Intelligence

3.1 Strengthening the Security and Protection Capabilities of Network Equipment and Systems

Colleges and universities should strengthen the security protection ability of network equipment and systems. Due to the openness and complexity of the computer network system in colleges and universities, there are various security risks, such as virus attacks, hacker attacks, etc. Colleges and universities should take corresponding security measures to strengthen the security protection capability of network equipment and systems. For example, colleges and universities can carry out strict control and supervision of the network through the use of firewalls, intrusion detection systems and other technical means, timely detection and treatment of network security loopholes, so as to protect the security, reliability and integrity of the data of the computer network system in colleges and universities. Based on risk avoidance, colleges and universities should go to build a perfect network security management system. Colleges and universities first establish

a sound network mechanism to constrain network users, and then configure professional network engineers to maintain the network, responsible for network daily management, in the daily popularization of the use of norms and common network protection measures, to increase the education of network management personnel, network management is an important factor is in fact the people, so we must strengthen the network security awareness of teachers and students, and then the network security of colleges and universities can be guaranteed. Artificial intelligence technology can be beneficial to strengthen and prevent the network hardware equipment and network system management, improve the efficiency of network management. Colleges and universities can use the dual measures of human defense and machine defense to strengthen the analysis of network data traffic, when network anomalies can be detected by artificial intelligence, managers can respond in time to make measures to improve personal network prevention skills. For artificial intelligence can be used based on big data intrusion detection system, once found suspicious network appeared in a timely manner to alarm and deal with.

3.2 Strengthening Monitoring and Early Warning of Cyberattacks

Colleges and universities can use security detection and early warning prevention software to collect, process and analyze the campus network in real time, and managers can grasp the network security situation in real time, deal with problems in a timely manner, and extinguish the seedling instantly. When there are various types of network behavioral anomalies, artificial intelligence will carry out in-depth analysis, and then improve the reliability of the university network computer system. In colleges and universities, a comprehensive inspection of the network can be established to repair vulnerabilities and prevent the emergence of vulnerabilities from being attacked.

For example, colleges and universities can use a deep learning-based system for preventing cyberattacks, where the collection and analysis of attack data is carried out, and artificial intelligence is used to deeply analyze and learn from the relevant data, so as to automatically realize the automatic identification and interception of various types of cyberattacks.

3.3 Promoting the Use of Advanced Artificial Intelligence Technologies

Colleges and universities should promote the use of advanced artificial intelligence technology, and should strengthen the in-depth research and application of artificial intelligence technology. Colleges and universities can open relevant artificial intelligence courses and research projects, cultivate and attract a group of professional artificial intelligence technology talents, and establish artificial intelligence technology research and application centers to promote the wide application of artificial intelligence technology in the field of computer network information security in colleges and universities. For example, colleges and universities can adopt a machine learning-based intrusion detection system to realize automatic identification and interception of various types of network attacks by analyzing and learning from network traffic data.

In the era of information technology, teachers, under the premise of new technology generation, to promote the reform of education digitalization and informatization, will add new roles from the traditional teacher-student relationship, forming a diversified model of teacher-student machine. For example, it can be applied to the intelligent tutoring system, which becomes a tool to assist teachers in the classroom, help teachers to solve students' doubts and promote the innovation of teaching mode.

Furthermore, artificial intelligence technology can even help colleges and universities establish a more intelligent and automated network security defense system to improve network security prevention and response capabilities. For example, colleges and universities can use the threat intelligence analysis system based on deep learning to analyze and warn network security events in real time, and ensure that the computer department network of colleges and universities can operate normally through the analysis and processing of network security events. Colleges and universities can also strengthen the combined application of artificial intelligence technology and other technical means. For example, colleges and universities can combine artificial intelligence technology with blockchain technology to establish a decentralized network security defense system and improve the credibility and robustness of network security. At the same time, colleges and universities can also combine artificial

intelligence technology with big data technology to establish a more accurate and efficient network security monitoring and early warning system, and improve network security prevention and response capabilities.

3.4 Conducting Cybersecurity Drills And Emergency Response Exercises

Colleges and universities should often carry out network security drills and emergency response drills, through the drills can restore the real occurrence of network attacks, managers through the drills can enhance the detection of network defense capabilities and emergency response capabilities, for network problems can be repaired in a timely manner, to find the network processing measures in times of crisis. Therefore, colleges and universities can organize network attack simulation simulation activities at the end of the year, through the personnel of multiple simulation to deal with network security time, the college network has a complete understanding of the college network, the college computer network system for the comprehensiveness of the test, check the security defense and emergency response capabilities, so as to improve the ability to guarantee the information security of the computer network of colleges and universities. Colleges and universities should adopt artificial intelligence technology to optimize network security drills and emergency response drills. Real-time data of network attacks are very beneficial to artificial intelligence, which can conduct deep analysis and learning based on these data to improve the intelligence and automation of network security drills and emergency response. Colleges and universities can use a machine learning-based cyber attack simulation system to simulate various cyber attack events, and improve the accuracy and efficiency of cyber security drills and emergency response by analyzing and learning from cyber attack data. For the method of network security awareness of teachers and students, colleges and universities can realize it by means of carrying out network training, network annual professional assessment, etc., and improve the network security awareness of teachers and students through the annual network behavioral assessment results as the annual quantitative standard, improve the knowledge and response ability of teachers, students, and staff on network security issues, and provide a strong

guarantee for the network security drills and emergency response drills.

4. Conclusion

Marshal Liu Bocheng once pointed out that "a good doctor is needed to open a hospital, a good cook is needed to open a restaurant, a good actor is needed to run a theater troupe, and the most important thing is to have a good instructor to run a school." Since ancient times, no matter how quickly the machine development, artificial intelligence is only an auxiliary tool for computer network information security research in colleges and universities, education informatization has always been a gradual and sustainable way. The reform of computer network information security research in colleges and universities needs to be implemented step by step, stage by stage, and the problems faced now in computer network information in colleges and universities are believed to be adjusted in the near future.

The analysis of computer network information security in colleges and universities based on artificial intelligence technology needs to strengthen the research and development of artificial intelligence technology and continuously improve the safeguards of computer network information security in colleges and universities. It is necessary to continuously improve the level of information security of computer networks in colleges and universities, and to guarantee the normal operation of the informationization construction of colleges and universities, in order to better protect the personal privacy and property security of teachers and students in colleges and universities.

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