ISSN 2616-7433 Vol. 1, Issue 10: 130-134, DOI: 10.25236/FSST.2019.011016

Application of Edge Computing Technology in the Security Industry

Kuo-Chi Chang[1] Yuh-Chung Lin[2] Kai-Chun Chu[3*]

1.2 Fujian Provincial Key Laboratory of Big Data Mining and Applications, Fujian University of Technology, Fuzhou, China
3 Kai-Chun Chu, Department of Business Administration Group of Strategic Management of National Central University, Taoyuan, Taiwan
**Corresponding Author*

ABSTRACT. *With the continuous development of clinical technology in recent years, edge computing is closer to the source of data and data, and it provides an open platform for edge intelligence services. Edge computing technology is initially applied to cloud computing, and it has gained positive effects in many aspects. effect. This paper analyzes the characteristics of edge computing technology, and proposes the use of edge computing technology in the security industry to explore future development trends.*

KEYWORDS: *Security industry; Edge computing; Technology*

1. Introduction

Unlike cloud computing, edge computing technology is more timely in acquiring and processing information[1]. It does not need to transmit all information to the cloud center for processing and feedback processing information. It can process information at the source of data and data, and it will be effective. Direct transmission of local information solves the problem of low timeliness of information processing and improves processing efficiency. This paper focuses on the application of edge computing technology to the security industry.

2. Edge Computing Technology Features

Since the edge calculation is closer to the data source, the data can be acquired in the first time, and the data can be analyzed and intelligently processed in real time, which is more efficient and safer than pure cloud computing. Compared with cloud computing, the characteristics of edge computing mainly include the following[2]:

ISSN 2616-7433 Vol. 1, Issue 10: 130-134, DOI: 10.25236/FSST.2019.011016

2.1 Distributed Low Latency

Since the edge calculation is close to the data receiving source, the data can be acquired and analyzed in real time, which can better support the real-time intelligent processing and execution of the local service.

2.2 High Efficiency

The edge calculation is closer to the user, and the data can be filtered and analyzed at the edge node without waiting for the data transmission time, so the efficiency will be higher.

2.3 Relieve Flow Pressure

Edge computing performs some simple data processing through edge nodes when performing cloud transmission. When faced with a large amount of data, a certain compression algorithm can be used to extract useful information and then transmit, which can save a lot of data bandwidth consumption.

2.4 High Security and Data Processing

After receiving the data, the edge calculation can encrypt the data and then transmit it, which improves the security of the data. Edge computing requires independent data processing after receiving data. If the chip performance is insufficient, complex data processing algorithms cannot be processed.

2.5 Specification Edge Calculation Output Data

Because the devices using edge computing technology are widely distributed in each data node, different processing algorithms may appear, and standards are required to standardize the output data format, otherwise it is not conducive to cloud data reprocessing.

3. Edge Computing Technology Development in the Security Industry

3.1 Video Encoding and Encryption Technology

When video surveillance transitions from the analog era to the digital age, the big problem is the huge amount of video data. For D1 video with a standard resolution of 704 X 576, if you don't compress the data, it will take about 250Mbps of data bandwidth to transmit 25 frames of video, which was impossible at that time[3]. Even now, the network bandwidth is qualitatively flying over, but facing the demand for high-definition video, if the data is not compressed, video transmission

ISSN 2616-7433 Vol. 1, Issue 10: 130-134, DOI: 10.25236/FSST.2019.011016

cannot be performed. Therefore, to transmit digital video, it is necessary to perform data processing at the data source and compress the video data. This video compression technology is actually an edge computing technology. And with the development of the times, people's demand for high-definition video development is much higher than the development of network bandwidth, so the edge computing technology of video compression has been developing and progressing. From the early DSP-based MJPEG and MPEG4 algorithms to the H264, H265 and SVAC algorithms based on proprietary encoding chip algorithms, the video compression rate has been improved. In addition, some requirements require encrypted transmission of compressed video, so some digital monitoring devices have the function of encrypting video on the device side, and this technology is actually an edge computing technology.

3.2 Special Analysis Algorithm

With the development of the security industry, users' needs are no longer limited to simple video preview, storage, and playback functions[4]. Security products are no longer just simple general-purpose monitoring products, but become professional video devices in various fields. One of the most well-known is the electric police and bayonet equipment in the transportation industry, because they need to have the ability to identify license plate numbers, detect red lights, and not to wear seat belts. These applications often require extremely high real-time data processing. Sex, and in the data center is only interested in illegal behavior and license plate number, so the device needs to process the data immediately after collecting the data, capture the violations, and then upload the illegal photos and license plate information to the cloud. This is a typical edge computing technique.

3.3 Deep Learning Face Recognition Artificial Intelligence Algorithm

Artificial intelligence began in the mid-1950s and then developed and fluctuated in the decades. In the late 1980s, with the rise of artificial neural network research, artificial intelligence entered a new stage. Especially in recent years, deep learning has made breakthroughs in artificial neural network optimization, making machine assistance possible and expanding the application field of artificial intelligence. Because the artificial intelligence algorithm consumes a lot of system performance, if only CPU operation is used, it is basically impossible to promote at the edge. So the previous artificial intelligence algorithms are more focused on the cloud. However, with the gradual maturity of technology, major chip manufacturers have begun to introduce chips of artificial intelligence algorithms, making the realization of artificial intelligence at the edge end possible. Major security vendors have also introduced artificial intelligence devices based on edge computing technology[5]. Among them, Tiandi Weiye's face capture series products are typical of them. The face capture device based on the edge computing technology enables the face data to be parsed in the first time when the pedestrian passes, and the face data is sent to the data center for matching processing, compared with the simple cloud computing

ISSN 2616-7433 Vol. 1, Issue 10: 130-134, DOI: 10.25236/FSST.2019.011016

solution. No need to upload all video data, it can greatly reduce data traffic and improve real-time performance, even if it is based on 4G network to ensure data integrity.

4. Edge Computing Technology Application Security Industry

In the traditional security industry, it is difficult to have better data processing efficiency. Generally, centralized processing of data is required before centralized processing. In this less efficient data information processing process, it is difficult to achieve the effect of vehicle interception.[6]. The edge computing technology plays a good role in improving the calculation and feedback of data in combination with various computing algorithms. The data processing efficiency is greatly improved, which provides greater convenience for vehicle identification technology and also promotes the security industry in the transportation field. Advantage development. Edge computing technology also has many different advantages in analytic algorithms, such as its ability to automatically detect workers entering the site but not wearing helmets, alerting them, or alerting people in the surveillance area, etc. It makes good use of the advantages of edge computing technology to promote the development of the security industry, and promotes the security industry to be used in many fields and different industries, greatly improving the utilization rate of security equipment and improving the development efficiency of the industry.

In modern video surveillance technology, edge computing technology combined with artificial intelligence algorithm can directly parse the face data in the video and transmit the data to the data center for automatic matching, which can alleviate the data caused by the full transmission of video data in the cloud computing process. The flow pressure not only improves the real-time performance of data transmission, but also brings more development advantages to the development of the security industry. The application of edge computing technology in the security industry promotes the further development of the security industry, and it also promotes the optimization and upgrade of technology. The future edge computing technology is in various technologies such as information technology, big data, cloud computing and artificial intelligence. The integration can give more advantages [7]. However, the application of edge computing technology in the security industry also faces many challenges. It requires open and secure use of edge nodes for end-to-end protection in cloud computing and edge computing. This is the edge access control of the network under the Internet. And threat protection brings an inevitable trend. Edge computing needs to protect equipment security, network security and application security, and protect data security and privacy. This also needs to solve many practical problems, such as workload and maintenance cost. Computing power, etc. In the security industry, the application of edge computing needs to pay attention to the solution of these problems, in order to better improve the advantages of edge computing technology and promote the development of the security industry. In general, the application of edge computing technology in the security industry has more advantages, but at the same time it also needs to pay attention to optimization and upgrade, so that it can better promote the common upgrade of industry and

ISSN 2616-7433 Vol. 1, Issue 10: 130-134, DOI: 10.25236/FSST.2019.011016

technology, improve the efficiency of technology use, and promote the development of the industry. .

5. Conclusion

Edge computing technology is a computing technology that has undergone long-term update replacement and assembly of various technical advantages. Data processing at the data source has greatly reduced data traffic pressure and improved data processing efficiency, providing development for the security industry. Positive meaning

References

[1] Liu F, Miao Z (2016). The Application of RFID Technology in Production Control in the Discrete Manufacturing Industry// IEEE International Conference on Video & Signal Based Surveillance. IEEE Computer Society, vol. 28, no. 1, pp. 164-169

[2] Lisok, Joanna (2016). Application of Modern Technology to Improve Safety in the Automotive Industry. Solid State Phenomena, vol. 246, no. 2, pp. 271-274.

[3] Song, Guijuan (2018). [IEEE 2018 International Conference on Intelligent Transportation, Big Data & Smart City (ICITBS)-Xiamen, China (2018.1.25-2018.1.26)] 2018 International Conference on Intelligent Transportation, Big Data & Smart City (ICITBS) - Application of Data Mining Technology in the CRM of Pharmaceutical Industry. vol. 57, no. 4, pp. 61-64.

[4] Li B, Lv S, Zhang Y, et al (2018). The Application of Trusted Computing Technology in the Cloud Security. Lecture Notes in Electrical Engineering, vol. 12, no. 1, pp.865-872.

[5] Netto A V (2015). Application of Interactive Technology for Training in the Security Area// 2015 XVII Symposium on Virtual and Augmented Reality (SVR). IEEE, vol. 28, no. 1, pp. 339-346.

[6] Zhang J, Chen B, Zhao Y, et al (2018). Data Security and Privacy-Preserving in Edge Computing Paradigm: Survey and Open Issues. IEEE Access, vol. 11, no. 3, pp. 57-61.

[7] Krüssel, Peter (2019). [Management for Professionals] Future Telco (Successful Positioning of Network Operators in the Digital Age) || Edge Computing: The Third Major Step in the Evolution of Telco Networks. vol. 118, no. 2, pp. 131-142