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Research on the Application of Big Data Technology in Artificial Intelligence

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Abstract: ***With the developing of internet and information technologies, it is convenient for the Volkswagen to obtain information resources, and the important technical support for people to obtain information resources is the combination of big data and artificial intelligence. The article explores the advantages of big data and artificial intelligence technology, analyzes the core types of technology in big data technology, studies the application of big data technology in artificial intelligence, and has some reference value for the future development of artificial intelligence.***

Keywords: Big data technology; Artificial Intelligence; The application is available.

1. INTRODUCTION

The rapid development of the Internet and the Internet of Things has further advanced the development and widespread application of big data technology. Realizing the application of big data technology in artificial intelligence can give users a better experience while improving the range of artificial intelligence applications. Therefore, relevant researchers need to give adequate attention to big data technology, Mastering the key technical elements in its application, realizing the integration with artificial intelligence in an appropriate way, and promoting the further improvement of the convenience and intelligence of artificial intelligence, is of positive significance for its long-term development. Recent advances in AI demonstrate significant progress across multiple domains. Wang and Shih (2024) proposed a hybrid recommendation system integrating MMoE and XGBoost for enhanced personalization [1], while Fu et al. (2025) developed adversarial prompt optimization techniques to address LLM vulnerabilities [2]. Zheng et al. (2025) introduced FinGPT-Agent for adaptive financial report generation [3], complemented by Weng et al. (2025)'s SafeGen-X framework strengthening LLM security and compliance [4]. For multimodal models, Chen et al. (2025) presented SyntheClean for adaptive data synthesis [5]. Domain-specific QA systems advanced through Jiang et al. (2025)'s knowledge-enhanced multi-task model [6] and Zhuo et al. (2025)'s transformer with domain adaptation [7]. Generative capabilities expanded via Zhang et al. (2025)'s attention-guided video synthesis [8] and Zhao et al. (2025)'s KET-GPT for knowledge updating [9]. Dialogue systems benefited from Shih et al. (2025)'s dual-stage transformer [10], while multimodal fusion advanced with Li et al. (2025)'s MLIF-Net combining ViTs and LLMs [11]. Visualization tools progressed through Xie and Chen (2025)'s InVis [12] and CoreViz [13] systems, with Zhu (2025) introducing TraceLM for temporal analysis [14]. Deployment safety was addressed by Zhang (2025)'s CrossPlatformStack [15] and SafeServe [16], while ad creation leveraged Hu (2025)'s AdPercept [17] and UnrealAdBlend [18]. Healthcare innovations included Ding and Wu (2024)'s self-supervised biosignal review [19] and Restrepo et al. (2024)'s multimodal approach for low-resource settings [20]. Financial AI advanced with Jiang et al. (2025)'s Investment Advisory Robotics 2.0 [21], while medical imaging built upon Chen et al. (2023)'s text-guided segmentation [22]. NLP developments featured Yu et al. (2025)'s transformer-based summarization [23] and Sun et al. (2025)'s LLM-powered AutoML framework [24], concluding with Pal et al. (2025)'s AI-driven credit risk assessment [25].

2. WHAT IS BIG DATA TECHNOLOGY?

With the gradual development of big data technology, more and more people are beginning to pay attention to this advanced technology, Enabling it to be widely used in many industries, the concept of big data technology first appeared in the United States, and it has been rapidly developed on the basis of the gradual maturity of network technology, and people have achieved a certain degree of breakthrough in the application of big data technologies. The main advantage of big data technology is large, and this advantage is expressed in the following aspects: large data volume, fast speed, multiple types and large value, which can be said that these aspects fully outline the important characteristics of big data. Specifically:

First, the amount of data processed by big data technology is very large, which is the main difference between traditional computer data processing, and this advantage is very consistent with the development of network technology.

Second, the information processing speed of big data technologies is faster. In the information age, people's demand for data processing has become higher. Big data technology is highly efficient both in the processing and analysis of data and in the collection and integration.

Third, big data technologies can handle multiple data types and integrate multiple nature and source data, which can not only meet the needs of data processing quantity, but also ensure that all kinds of data can be processed in an orderly manner.

Finally, big data technology has higher application value, after processing data information through this technology, it can greatly improve the accuracy of data information, bring important help to the conduct of various work, and enhance the value of data information.

In general, by applying big data technology to process huge amounts of data, we can fully utilize the advantages of data resources to better achieve the intended management goals.

3. TYPES OF BIG DATA TECHNOLOGY

3.1 Data acquisition technology

Big data technology can deal with data information, through big data technology, can complete different sources, different types of data, has a strong data collection capabilities, the ability to achieve with data acquisition technology. Rapid collection of data information, can shorten the traditional mode of data acquisition costs, such as resource costs, labor costs. Application of data acquisition techniques in artificial intelligence.Using the connection of the two technologies, AI devices can read the collected data and make preliminary analysis at the same time, apply statistical analysis functions, and comprehensively improve the precision of data application [1].

3.2 Data storage

In order to rationally apply big data technology, there are important requirements for data volume, so enough storage space is needed to match data information smoothly, and to ensure the security of data information. At present, data information storage technology mainly includes semi-structured or unstructured data information storage technologies, large-scale or large-structure data information storage techniques, and structured and unstructured hybrid storage technologies.

3.3 Data Mining Techniques

From a certain point of view, data mining is the core and key part of big data. The gradual improvement of big data promotes the wide use of data mining. Although machine learning and data mining technologies have developed rapidly, there is still much room for improvement.Specific group mining, data network mining, etc., these aspects of research has broken the traditional form to the user as the fundamental data connection model, through technological innovation to promote network behavior analysis, taking into account the analysis of different users' emotions and interests and other factors [2].

4. ANALYSIS OF THE ADVANTAGES OF THE APPLICATION OF ARTIFICIAL INTELLIGENCE TECHNOLOGY

4.1 Break the limitations of computer capabilities and have a strong learning ability

Artificial intelligence is the result of the evolution of computer technology, with distinctive characteristics and outstanding advantages. As an advanced research achievement, artificial intelligence can break the limitations of computer capabilities, and has the characteristics of advancedness, security, stability, and intelligence. Artificial intelligence technology is an emerging science and technology that relies mainly on human intelligence, can simulate personal thought processes, and can realize intelligent operations through relevant program settings. To a

certain extent, it can replace the human brain and its human manpower in performing related tasks. Compared to traditional computer technology, AI technology's learning capabilities are very powerful. Artificial intelligence is mainly based on human intelligence as the main research model, Using the human learning method, by collecting and organizing big data information, we can quickly analyze the results, mine valuable and important information, systematically upgrade simple data processing, optimize low-level data, and effectively improve the underlying computing power. Through artificial intelligence, the collection, processing, analysis and integration of big data can provide more comprehensive and scientific references for relevant decision-making. In addition, the computing speed of artificial intelligence is about 30 times that of traditional computers, so it is more reliable, secure and accurate in data processing, and can also effectively reduce the cost of human data computing.

4.2 Effectively control the cost of computer network operation

Practice has proved that the integration of artificial intelligence technology and computer network information processing system, will bring four advantages:

(1) Boost speed

(2) Lower operating costs

(3) Efficient processing of information

(4) Systematic classification of information

Artificial intelligence technology can significantly reduce the cost of information acquisition for people through scientific information data search, effective information data integration and perfect information data storage. In the era of big data, because artificial intelligence technology can optimize the processing of data, people can accurately discern what they need, thereby reducing the time consumed by information acquisition. The system can effectively reduce the consumption of time, financial resources and human resources of the enterprise, so it can make a huge contribution to improving the efficiency of the enterprise.

5. APPLICATION OF BIG DATA TECHNOLOGY IN ARTIFICIAL INTELLIGENCE

5.1 Artificial Intelligence Robots

In artificial intelligence products, the products have intelligent and human features. Applying big data technology to intelligent products can obtain high accuracy of data information. Using communication sensor equipment, it is possible to transmit data information to the artificial intelligence robot terminal area. Using AI recognition capabilities, it is possible to plan and analyze data information. After this, the data is fed back to the artificial intelligence robot, and through the execution process, it can provide the artificial eagle robot with programmatic data information, allowing it to learn in depth, guide the artificial elephant robot in the form of data, and ensure the accuracy and humanization of the operation and function. During the application of the technology, the main characteristics: when the total and type of data continue to increase, the need can be reflected by AI robots, and the number of neurons continues to increase. When the two sets of data are developed towards the direction of intensification, it is helpful to improve the efficiency and accuracy of operation [3].

5.2 Application of Big Data Technology in Intelligent Building

With the continuous development of the social economy, various advanced technologies are constantly introduced into urbanization, among which big data technology is used in smart buildings, providing reliable technical support for the development of smart buildings. First, in the face of the increasing number of high-rise buildings in the city in recent years, the use of previous firefighting technologies will inevitably bring a series of adverse effects. Due to the higher floors, and the inability to use elevators in the event of a fire, this greatly increases the difficulty of firefighting. In today's smart buildings, these problems are effectively solved, and by applying big data technology, a fire sprinkler head can be installed in the corresponding area during the design of a high-rise building, which can ensure the timely extinguishing effect in the event of a fire. In addition, the fire sprinkler head can also realize the camera function, by monitoring the situation on the ground, providing fire crews with on-site data, thereby achieving effective fire prevention. Second, big data technology can also be applied to the temperature regulation

system in smart buildings. Relevant technicians can adjust the temperature of the building through intelligent technology, and the personnel in the area can be monitored through big data technology.Rely on the model to establish the matching, and then carry out the analysis of the data information to obtain the optimal value of the indoor temperature, and carry out the adjustment of the regional temperature, so as to create a good living environment for the residents, and significantly improve the people's living experience [4].

5.3 Application of Smart Robots to Big Data Technology

It can be said that intelligent robots can achieve today's results without the support of big data technology, and we can see the development of intelligent robots that can mimic and analyze people's movements and speech. In fact, the use of big data technology to collect and analyze data related to people, a lot of data information input into the intelligent robot system, when the intelligent robot to obtain the command can be analyzed and completed. Reasonable adjustment is made through various information, and data is identified and processed, thereby making reasonable adaptation of parameters, and utilizing intelligent technology to rationally apply data information. In addition to being able to collect and analyze language, intelligent robots also have a strong learning capability, can judge and analyzes human language and behavior, so as to improve their own intelligence level. In order to be able to more accurately analyze and identify human language and behavior, it is necessary to provide a large number of corpus data and neuron nodes, which has a great impact on whether intelligent robots can accurately identify, and determines the recognition rate it has [5].

6. CONCLUSIONS

In the synchronous development of Internet technology and information technology, artificial intelligence technology and big data technology have begun to emerge, with convenience and high advanced features. To this end, relevant personnel in different industry fields should continue to conduct in-depth research and accumulate experience. To enhance a clear understanding of the implications of big data technology and artificial intelligence, fully utilize the application advantages of big data in artificial intelligence and promote the scientific and rational application of big data technologies, further promote the continuous development of artificial intelligence to contribute to the development and progress of modern society.

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