

Exploration and Practice of Parallel Logistics and Transportation System Basing on AI

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Abstract: With the rapid development of science and technology, artificial intelligence (AI) technology has been widely used in various fields. As an important pillar of the national economy, the efficiency and safety of the logistics and transportation industry have a profound impact on the economic development and social progress. The exploration and practice of parallel logistics and transportation system based on AI aims to use artificial intelligence technology to improve the efficiency of logistics and transportation system, reduce costs, reduce congestion, and improve traffic safety.

Keywords: AI; Parallel Logistics; Transportation System; Exploration.

1. Introduction

Parallel logistics was put forward by Chinese scientists as early as 20 years ago. With the continuous advancement of globalization and information technology, logistics and transportation system are playing an increasingly important role in modern society. With the vigorous development of China's e-commerce, the number and scale of logistics are growing rapidly, which has a serious impact on China's transportation system, which makes the development of the logistics industry face great challenges, and it is imperative to explore the connection and development of AI-based parallel logistics and transportation system.

2. The Connection between the Parallel Logistics and the Transportation System

2.1. Data Sharing and Integration

In the modern supply chain management system, the data sharing and integration between parallel logistics and transportation system is very important. Logistics systems involve multiple transport modes, including road, rail, air and shipping, which require sharing and integration of transport data in real time. Data sharing helps transportation systems to effectively manage and schedule traffic flow, while integration can improve the transparency and collaborative efficiency of the entire logistics network. For example, through the use of AI technology, the data between different transportation modes can be exchanged in real time, so that every link of the logistics network can understand the state of cargo transportation in real time and improve the transportation efficiency.

2.2. Optimization of the Transportation Network

Transportation network optimization is an important aspect of the connection between parallel logistics and transportation system. Transportation systems can optimize route planning, transportation time, and cargo distribution by collecting and analyzing large amounts of traffic data. The AI algorithm is able to handle these complex data and provide the optimal transportation scheme. For example, AI can analyze historical

traffic data and predict future traffic conditions, thus providing logistics companies with optimal transport route advice, reduce delays and congestion, and improve transport efficiency.

2.3. Intelligent Scheduling and Control System

Intelligent scheduling and control system is another important aspect of the connection between parallel logistics and transportation system. AI technology can be used in intelligent scheduling and control systems to achieve the optimal configuration of transportation resources. For example, AI can predict traffic flow, automatically adjust signal lights, optimize traffic signals, reduce waiting times, and improve road capacity. In addition, AI can also be applied to the scheduling of logistics systems. By analyzing the nature of goods, transportation time and destination, it can automatically allocate the optimal transportation means and routes for transportation tasks and improve transportation efficiency.

2.4. Safety Monitoring and Risk Management

Safety monitoring and risk management are one of the important aspects of the connection between parallel logistics and transportation system. AI technology can help transportation systems with real-time monitoring and risk management. By analyzing sensor data and video surveillance, AI can detect traffic accidents and anomalies in time, provide early warning, and respond quickly to ensure traffic safety. For example, AI can analyze road sensor data, predict potential risks of traffic accidents, and provide early warning information to traffic management departments in a timely manner to help them take corresponding measures to prevent traffic accidents [1]

3. The Significance of the Exploration and Practice of Parallel Logistics and Transportation System based on AI

3.1. Improve Transportation Efficiency

In the field of logistics and transportation, the application of AI technology can bring about significant transportation efficiency improvement. In-depth analysis and prediction of a large amount of logistics and traffic data through AI

technology can optimize route planning, improve the utilization rate of transportation vehicles, and reduce empty driving and congestion. For example, AI systems can provide optimal route advice for truck drivers based on real-time traffic conditions and prediction models, avoiding peak hours and congested road sections, thus saving time and fuel, and improving transportation efficiency. In addition, AI technology can also realize intelligent scheduling, and automatically arrange the most appropriate transportation mode and time according to the cargo demand and transportation resources, so as to further improve the transportation efficiency of the entire logistics system.

3.2. Reduce Operating Costs

The application of AI technology in the field of logistics and transportation can help enterprises to realize automatic scheduling and intelligent storage management, so as to reduce labor costs and improve operational efficiency. For example, AI systems can automatically process a large amount of order information and conduct intelligent scheduling without human intervention, saving human costs. At the same time, AI technology can also be applied to warehouse management, through intelligent robots to carry and store goods, improve storage efficiency and reduce labor costs. In addition, AI technology can also help enterprises more accurately predict market demand through predictive analysis, and avoid excessive inventory and stock shortages, thus reducing operating costs.

3.3. Improve Traffic Safety

The application of AI technology in traffic safety is of great significance. Through intelligent monitoring and autonomous driving, AI technology can effectively reduce the occurrence of traffic accidents and improve road safety. For example, autonomous driving technology can collect road information through sensing devices, intelligently judge traffic conditions, and automatically control vehicles running, and reduce traffic accidents caused by human error. In addition, AI technology can also be applied to intelligent traffic signal control, through real-time analysis of traffic flow and conditions, automatically adjust the timing of traffic signal lights, reduce traffic congestion and accidents.

4. Exploration and Practice of Parallel Logistics and Transportation System based on AI

4.1. Strengthening the Research and Development of AI Technology

With artificial intelligence as the core, promote the system upgrade in the field of logistics and transportation, priority is to deepen the basic theory of artificial intelligence technology exploration and application practice research, improve the accuracy of artificial intelligence algorithm, tenacity and flexibility, explore machine learning and deep learning methods and models, and innovation to adapt to the specific needs of logistics and transportation field AI solutions [2]. Explore and develop to cope with the challenge of multifarious logistics reinforcement learning technology, or specially designed to predict traffic flow and optimize the path of deep learning model, at the same time, must focus on the ethics and privacy of artificial intelligence, ensure the fairness and clarity of intelligent system, in the process of developing intelligent system, must strictly abide by the

ethical laws and regulations, guarantee artificial intelligence in processing personal information can thoroughly respect the user's privacy and legitimate rights and interests.

4.2. Establish a Big Data Platform

In the field of modern logistics and transportation, countless information like the tide, involving the content from the path of the goods flow, the condition of real goods, the use of the road, to the performance of the vehicle, etc., in order to maximize the value of the data, it is necessary to build a large integrated data processing center, it will be responsible for collecting, retained, organization and depth analysis of all kinds of data information. This platform can provide instant information, help artificial intelligence system to achieve more accurate prediction and selection, but also provides a vast information treasure, create a distributed information and data purification, joint and unified standards, information precision and unification, at the same time, we need to use cutting-edge data analysis technology and methods, such as machine learning, data mining and predictive analysis, to dig into the potential of data, and extract its value[3].

4.3. Promoting Industrial Coordination

Reform of logistics and transportation system, to the social from all walks of life together, government, companies, academic groups and universities to closely hand in hand, promote on the basis of artificial intelligence logistics and traffic management system, the government should introduce corresponding policies and provide financial support, build conducive to artificial intelligence technology progress policy system and legal architecture. The company can provide practical scenarios and data materials, and work together with scientific research and educational institutions to carry out technological innovation and talent cultivation. The research institutions have the ability to carry out technological innovation and create cutting-edge AI applications, and at the same time, they maintain close cooperation with commercial entities and government departments [4]. Training institutions can forge high-quality talents and provide AI with professional knowledge and skills in the field of logistics and transportation. Through the coordinated development of the industrial chain, they can build a perfect ecosystem, and then promote the in-depth application of artificial intelligence technology in the logistics and transportation industry.

4.4. Improve Policies and Regulations

In order to ensure the healthy growth of AI technology in the logistics and transportation industry, it is necessary to customize a set of appropriate policies and regulations system. Relevant policies and regulations should include data insurance, privacy defense, algorithm clarity, obligation determination and other fields, so as to provide clear legal norms and direction guidance for the implementation of AI technology. About the data preservation network regulations, to ensure that personal information collection, retained and disposal are conform to the rule of law, justice and clear standards, at the same time safeguard the legitimate rights and interests of data related get due fear, at the same time, the government needs to increase the control of artificial intelligence technology, ensure the stability of the intelligent system and reliable, so as to maintain the legitimate interests of consumers and users, set up specialized departments, take on the artificial intelligence system development and use of regulatory responsibilities, ensure its compliance with the

relevant legal norms, and implement effective strategies against possible risks and challenges.

5. Sum up

In the context of rapid progress in technology, AI technology has become a key force driving the transformation of the logistics and transportation industry. By integrating AI technology, we are able to achieve intelligent management and optimization of logistics and transportation systems, thus significantly improving system efficiency, reducing operating costs, reducing traffic congestion, and enhancing road safety. In the logistics field, AI applications include automated warehouse management, intelligent distribution route planning, cargo tracking, and supply chain optimization. In traffic systems, AI technology is used to achieve intelligent traffic control, the development of autonomous vehicles, traffic congestion management, and accident prevention. The integration of these technologies has revolutionized the

logistics and transportation industries, making services more efficient, cheaper and better.

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