

Thoughts on the Development Status and Application Direction of the Driverless Industry

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Abstract— Unmanned driving technology is a collection of many technologies such as automatic control technology, artificial intelligence, and visual processing. It is a product of the highly developed computer science, pattern recognition, and intelligent control technology. It is essentially an upgrade of the automotive industry and a measure of a country's scientific research strength. And industrial level important signs. This article introduces the development status of the driverless industry and the visible application prospects, hoping to provide some suggestions for the development of the driverless car industry in China.

Keywords— Driverless, development status, application prospects.

I. INTRODUCTION

With the rapid development of artificial intelligence, the Internet of Things, big data, information and communication technologies, and the accelerated integration of automobiles and electronics, communications, and the Internet, the driverless smart car industry will become a new global industry commanding height Self-driving cars can not only improve vehicle safety, but also reduce problems such as traffic congestion based on algorithms, and have great commercial application prospects. McKinsey predicts that the value of self-driving cars may reach \$ 200 billion-1900 billion in 2025, and HIS predicts that self-driving cars will reach 4.8 million units in 2035. Governments in various countries have issued corresponding policies to support the development of related companies in the field of autonomous driving in order to take the lead. The "Made in China 2025" plan also clearly proposed to accelerate the intelligent transformation of China's automobile industry. Therefore, sorting out the development status and application prospects of the driverless industry is the realistic need to promote the development of the driverless industry in China.

II. DEVELOPMENT STATUS

At present, unmanned driving technology is still in the initial stage of development. It is mainly based on the research and development of car companies and Internet giants. Auto companies have gradually increased the degree of automation of cars, and have continued to develop towards fully autonomous driving. Internet giant companies have advanced Internet platforms. Using accurate algorithms and advanced cloud service platforms, artificial intelligence technology is used to gradually improve the deep learning capabilities and autonomous decision-making capabilities of automotive control systems, in an attempt to achieve complete unmanned driving. Major car companies, Internet giants, chip companies and sensor companies have launched driverless related technologies, which has greatly enriched the key links in the industrial chain. The unmanned industry chain is fully mature. The research on driverless technology is divided into two phases: bicycle intelligence and intelligent transportation.

Bicycle intelligence is the fundamental path to achieve the ultimate form of driverless driving. Vehicle connectivity and intelligent transportation are catalysts to promote the development of driverless technology and help build an intelligent driving ecosystem. .

Regarding driverless technology, Chen Ye and others believe that environmental perception technology, driver assistance systems, and automotive safety electronics are key technologies for implementing driverless cars, and analyze the application of sensor technology in driverless cars from a patent perspective ^[1]. Regarding the development of the self-driving car industry, Meyer pointed out that the overall development of smart cars must consider driving safety, energy conservation and environmental protection, and market demand ^[2]. Tsugawa believes that high-level perception systems, advanced road facilities and related legal provisions can be a smart car industry. Development provides competitive support ^[3].

III. COMMERCIAL PROSPECTS FOR SPECIFIC SCENARIOS OF DRIVERLESS CARS

Relying on the "single-vehicle intelligence" approach alone to transform the automotive industry cannot achieve autonomous driving at the intelligent transportation level, nor can it quickly advance the commercialization of autonomous vehicle technology. Although the number of commercial vehicles in China is less than that of passenger vehicles, commercial vehicles are easier to achieve driverless than passenger vehicles, and unmanned driving of commercial vehicles will precede passenger vehicles. Commercial vehicles such as urban BRT buses, airport shuttles, urban water trucks, and scenic vehicles use unmanned driving technology to support repeated work on fixed areas, relatively fixed lines, and high-precision maps to ensure good safety. Commercial vehicles pursue stability, high efficiency, and cost reduction. These problems can be solved well by using driverless technology. In industries with high risk and high intensity operations such as mining and coal mining, and the uncertainty of the work area is extremely low, the use of unmanned driving can effectively replace traditional mining and transportation methods, improve the industry's safety

standards, and greatly reduce Production costs and increase production efficiency.

IV. DEVELOPMENT PROSPECTS OF DRIVERLESS CARS IN AGRICULTURE

With the continuous acceleration of urbanization in China, the way of agricultural cultivation in China will gradually shift to large-scale mechanized production. Official data show that in the past two decades, an average of 10 million people have been transferred from rural to urban areas each year. In the future, agricultural employment will be reduced to less than 100 million, and China's agricultural labor force may have a large gap. For China's grain production and storage, the application of driverless technology in agricultural equipment manufacturing is urgent. Unmanned agricultural machinery can save operating time, improve operating efficiency, increase operating income, and can further reduce labor costs and time costs based on agricultural mechanization. Meetings of the State Council clearly stated many times that the "Internet + agricultural machinery operation" model should be promoted, and the promotion and application of unprotected agricultural machinery for plant protection should be standardized and promoted. In northeastern China, unmanned agricultural machinery can already complete the processes of land preparation, rice transplanting, spraying, fertilizing, and harvesting, which effectively reduces labor intensity, saves labor, and saves a lot of costs. Therefore, the use of driverless technology in agricultural equipment should further liberate the rural labor force, improve the efficiency of agricultural operations in our country, reduce operating costs, and increase agricultural income.

V. DEVELOPMENT PROSPECTS OF UNMANNED DRIVING IN MODERN LOGISTICS INDUSTRY

The development of the modern logistics industry has transformed from a labor-intensive industry to a technology-intensive industry, and vigorously researching and developing

unmanned distribution logistics services based on driverless technology has become the primary task of major logistics companies. In the field of modern logistics, how to improve logistics efficiency and reduce operating costs are two important issues. If driverless technology can be applied to modern logistics systems, it will greatly improve efficiency and reduce operating costs. Under the influence of the new crown pneumonia epidemic, the unmanned delivery vehicle developed by JD.com has been put into use in Wuhan, and intelligent unmanned delivery has been used in the outbreak area. First, it began to be delivered at Wuhan Ninth Hospital with a lot of logistics needs and confirmed cases. The intelligent unmanned car developed by JD.com integrates a variety of high-tech technologies such as automation, computers, and artificial intelligence. It can not only replace the human eye for 360 degree environmental monitoring, proactively avoid roadblocks and pedestrians, and immediately respond to traffic lights. Can also stop at the distribution point and send the pickup information to the user. At the same time, driverless sweepers and driverless traffic jams based on Baidu's Apollo system have also been put into use in hospitals and various public places. In this epidemic, driverless vehicles developed by logistics companies have played an important role in fighting the epidemic. In the future, driverless cars will greatly improve the operational efficiency of the logistics industry and reduce the production costs of the logistics industry.

REFERENCES

- [1] Chen Yun, Zhang Yawei, Chen Long. Application and patent analysis of sensor technology in driverless cars [J]. *Journal of Functional Materials and Devices*, 2014, 0201: 89-92.
- [2] Meyer G. City Mobil2: Challenges and Opportunities of Fully Automated Mobility, in *Road Vehicle Automation* [J]. Springer International Publishing, 2014, 21 (9): 169-184.
- [3] Tsugawa S, Kato S. Energy ITS: another application of vehicular communications [J]. *IEEECommunMag*, 2010, 48 (2): 120-126.