Construction and Practical Research of Intelligent Connected Vehicle Experimental Platform under the Background of Industry Education Integration

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Abstract: With the intelligent and networked development of the automotive industry, intelligent connected vehicles have become a key direction for solving traffic safety, efficiency, and environmental protection issues. Against this backdrop, this paper delves into the construction project of the Intelligent Connected Vehicle Laboratory Center at University of Sanya and the research project on the exploratory experimental platform for autonomous driving technology under the background of industry-education integration. "Dual intelligence" vehicle-road coordination not only needs to address the synergy between vehicles and roads but also the connection between vehicles and cities. Through the transformation of automobiles, transportation, and road facilities, urban intelligent management can be promoted. By analyzing the significance of intelligent connected vehicle technology in both industrial and educational fields, the necessity and feasibility of constructing an experimental platform are clarified. This study aims to build a fully functional and expandable experimental platform to promote the informatization of teaching and the construction of academic disciplines, while also fostering school-enterprise cooperation and aiding the upgrading of the automotive industry. It is anticipated that through the construction and practice of the experimental platform, significant achievements will be made in talent cultivation, technological innovation, and industrial services. This will cultivate high-quality professional talents in the field of intelligent connected vehicles, drive technological progress and application development, and achieve a deep integration of education and industry.

Keywords: Intelligent Connected Vehicle; Autonomous Driving; Industry Education Integration; Vehicle Road Coordination; School Enterprise Cooperation

1. Introduction

With the rapid advancement of technology, the automotive industry is undergoing an unprecedented transformation, with the emergence and development of intelligent connected vehicle technology becoming a key force driving this change[1]. Intelligent connected vehicles have shown great potential in addressing traffic safety, traffic efficiency, and automotive environmental protection, making them the new focus of global automotive industry development[2]. Against this backdrop, both the upgrading of the automotive industry and the educational reform in related fields in colleges and universities face new opportunities and challenges.

In the automotive industry, the development of intelligent connected vehicles is gradually moving from theoretical research to practical application[3]. This means that automobile manufacturers and related technology companies need a large amount of experimental data to verify and optimize their technologies. Meanwhile, colleges and universities need to keep pace with this development trend and cultivate professional talents that meet the industry's needs. Therefore, constructing a fully functional and expandable intelligent connected vehicle experimental platform is of great significance for both the technological innovation of the

automotive industry and the talent cultivation of colleges and universities.

During the research process, we will combine the laboratory equipment and datasets of Geely Group to develop and experiment with autonomous driving technology, and invite experts and practitioners from Geely Group to participate in the research work to obtain more professional knowledge and practical experience. Through these research and development efforts, we will provide important references and support for the further development of autonomous driving technology. The outcomes of this project will include the construction of the experimental platform, the development and optimization of autonomous driving technology, and the analysis and summary of relevant literature and case studies. These achievements will help promote the progress and development of autonomous driving technology and provide significant support for the autonomous driving industry under the background of industry-education integration.

University of Sanya as a higher education institution that emphasizes the integration of industry, academia, and research, actively responds to this industrial demand and educational mission. The college has proposed the construction project of the Intelligent Connected Vehicle Laboratory Center and has carried out research on the exploratory experimental platform for autonomous driving technology based on the concept of industry-education integration. Through the construction of this experimental platform, the college will not only be able to provide strong support for the teaching of various majors in the college but also promote the development of teaching informatization and the construction of academic disciplines, and strengthen the cultivation of students' practical and innovative abilities. At the same time, the college has closely cooperated with enterprises such as Geely New Energy Commercial Vehicle Research Institute, leveraging their technological advantages and market demands to jointly promote the research and application of intelligent connected vehicle technology and achieve a deep integration of education and industry.

This paper will thoroughly explore the necessity, feasibility, and objectives of the construction of the intelligent connected vehicle experimental platform, and will elaborate in detail on the content and methods of platform construction. On this basis, we will look forward to the future development prospects of the experimental platform in the field of intelligent connected vehicles and its role in promoting the industry-education integration model.

2. Necessity of Intelligent Connected Vehicle Experimental Platform Construction

2.1 Serving the Upgrading Needs of the Automotive Industry

The global automotive industry is accelerating its transformation towards intelligent and networked development, with intelligent connected vehicles being seen as a key solution to many traditional traffic problems[4]. Against this trend of industrial development, many automotive companies, including Geely, are actively promoting the research and testing of related technologies but face practical challenges such as low testing efficiency, long testing cycles, and high costs. The construction of an intelligent connected vehicle experimental platform can provide enterprises with a simulated real-world testing environment, enabling automated and efficient testing of vehicles under various operating conditions. This can greatly shorten the testing cycle, reduce the cost of human and material resources, and help automotive companies accelerate product iteration and enhance market competitiveness, thereby promoting the upgrading process of the entire automotive industry.

2.2 Promoting Characteristic Teaching in Colleges and Universities

From the perspective of college and university education, the complexity and diversity of intelligent connected vehicle technology determine its high requirements for practical teaching[5]. Traditional teaching models are difficult to meet students' needs for a deep understanding and mastery of this cutting-edge technology. The intelligent connected vehicle experimental platform can truly replicate intelligent driving scenarios, providing practical support for courses related to the principles of intelligent connected vehicle technology, testing technology,

advanced driver-assistance systems, and vehicle-to-everything (V2X) communication technology. Through practical operations on the platform, students can better integrate theoretical knowledge with practical applications and improve their ability to solve practical problems. Moreover, the platform helps to build a deep graduate teaching system, promotes the cross-integration of different disciplines, and cultivates high-quality professional talents with comprehensive abilities and teamwork spirit, laying the foundation for colleges and universities to form characteristic teaching advantages in the field of intelligent connected vehicles.

2.3 Implementing National Policy Orientation

In recent years, the state has introduced a series of policies to vigorously promote the development of intelligent connected vehicles and vehicle-road coordination. For example, the "Dual Intelligence City" pilot policy aims to enhance urban management efficiency and service levels through the construction of intelligent transportation systems[6]. The construction of an intelligent connected vehicle experimental platform is an important measure for colleges and universities to actively respond to the national policy call. It can provide the necessary experimental conditions for the research, testing, and application of intelligent connected vehicle technology, promote the innovation and development of vehicle-road coordination technology, and drive the construction of a smart transportation system. This will help achieve the national strategic development goals in the field of intelligent connected vehicles, enhance the country's overall capacity for scientific and technological innovation, and improve the modernization level of transportation.

2.4 Promoting Scientific Research Innovation and Technological Breakthroughs

There are still many technical challenges in the field of intelligent connected vehicles that need to be overcome, such as the accuracy of complex environment perception, the reliability of decision-making and planning, and the precision of control execution[7]. The experimental platform provides researchers with a centralized environment for research and experimentation, facilitating in-depth exploration of these key technologies. By simulating various complex scenarios on the platform, researchers can collect a large amount of experimental data for technological optimization and algorithm improvement, thereby promoting the innovative development of intelligent connected vehicle technology, increasing the maturity and reliability of the technology, and providing strong technical support and theoretical basis for the technological progress of the industry.

2.5 Meeting the Talent Market Demand

With the rapid rise of the intelligent connected vehicle industry, the demand for related professional talents in the market is growing explosively, while there is a significant gap in the supply of professional talents[8]. As an important base for talent cultivation, colleges and universities can build intelligent connected vehicle experimental platforms to enable students to get in touch with and master cutting-edge technologies in the industry during their studies. This enhances students' practical skills and innovative thinking abilities, making them better adapted to future career development requirements. At the same time, the experimental platform also helps to attract and retain outstanding scientific research talents, providing sufficient talent reserves for the sustainable development of the intelligent connected vehicle industry.

3. Feasibility Analysis of Experimental Platform Construction

3.1 Climate and Environmental Advantages

Sanya's unique high-temperature and high-humidity climate provides complex environmental conditions for the testing of intelligent driving systems. Under such climate conditions, intelligent driving systems face challenges such as heavy rainfall, high humidity, and high temperatures. These conditions can fully test the stability and reliability of the systems[9]. Testing in high-temperature and high-humidity environments can better verify the performance of intelligent driving systems in hot and humid conditions, ensuring their safety and

reliability in various adverse weather conditions. In addition, the extensive closed campus of University of Sanya provides a relatively independent and safe testing environment for the experimental platform. The campus road network is diverse, including straight roads, bends, and slopes, which can simulate various urban road scenarios to meet different testing needs. Moreover, the campus environment is relatively quiet with controllable traffic flow, reducing interference and risks to external public road traffic, making it an ideal venue for the development and testing of intelligent driving systems.

3.2 Technical Basis and Equipment Resources

University of Sanya already has a certain foundation in experimental equipment, such as laser radar experimental platforms, millimeter-wave radar experimental platforms, by-wire chassis experimental platforms, machine vision experimental platforms, and autonomous driving simulation platforms. These devices have played an important role in teaching and research, providing a good hardware basis for the construction of the experimental platform. The college's supercomputing center has powerful computing capabilities that can support the processing of large amounts of data and the operation of complex algorithms in intelligent connected vehicle experiments. In addition, the college has a wealth of technical resources and datasets that can provide necessary technical support and data assurance for the development and testing of the experimental platform.

3.3 School-Enterprise Cooperation Basis

University of Sanya has established a close industry-academia-research cooperation relationship with Geely New Energy Commercial Vehicle Research Institute, providing solid technical support and industrial demand for the construction of the experimental platform. The college plans to introduce L2+ level light-duty trucks independently developed by Geely Commercial Vehicle Research Institute, which solves the vehicle-end demand for vehicle-road coordination and provides a basis for subsequent vehicle-road perception fusion transformation. Geely Commercial Vehicle Research Institute has rich experience and technical accumulation in the field of intelligent driving and can provide the latest intelligent driving technology and professional knowledge support for the experimental platform. Through in-depth cooperation with enterprises, the college can obtain the actual needs and market dynamics of enterprises, ensuring that the research direction of the experimental platform is closely integrated with industrial demand[10]. At the same time, the active participation of enterprises also provides the necessary financial support and resource assurance for the construction and operation of the experimental platform.

3.4 Teacher Team Support

University of Sanya has a research team composed of teachers from various disciplines such as vehicle engineering, intelligent control, mechatronics, and IoT communication, providing strong intellectual support for the construction of the experimental platform. Members of the teacher team have rich professional knowledge and practical experience in their respective disciplines and can provide professional guidance and support for the design, construction, and management of the experimental platform. Team members can participate in the layout design of the experimental platform, equipment configuration, test method formulation, data analysis and evaluation, and other work to ensure the technical advancement and reliability of the experimental platform. In addition, the teacher team can also participate in scientific research projects and cooperation exchanges to collaborate with experts and scholars in the industry, enhancing the research capabilities and influence of the experimental platform in the field of intelligent driving test evaluation.

3.5 Policy and Support Environment

The state and local governments have attached great importance to the development of intelligent connected vehicle and vehicle-road coordination technology and have introduced a series of supportive policies and regulations[11]. These policies provide a favorable policy environment for the

construction and development of the experimental platform. For example, Hainan Province, as a reform frontier in China, actively promotes the application and development of intelligent connected vehicle technology and provides policy preferences and financial support for related projects. As a local university, University of Sanya can fully utilize these policy advantages to obtain more resources and financial support to ensure the smooth construction and efficient operation of the experimental platform.

3.6 Market and Application Prospects

The rapid growth of the intelligent connected vehicle market provides broad application prospects for the construction of the experimental platform. With the gradual scaling and marketization of vehicle-road coordination, the Chinese vehicle-road coordination market size is expected to reach 49.6 billion yuan by 2030 (as shown in Figure 1, the forecast data is from the https://www.iyiou.com). The market potential is huge. China's vehicle-road coordination is currently still in the stage of separate construction of vehicle-road-cloud-network-end, and in the future, it is expected to connect the technology end, information end, and application end to achieve interconnectivity and create true vehicle-road coordination.[12] As the intelligent connected vehicle technology gradually matures and is commercialized, the demand for related technologies and talents will continue to increase. By constructing the intelligent connected vehicle experimental platform, University of Sanya can provide technical support and talent assurance for local economic development and industrial upgrading. At the same time, it can also bring new opportunities and challenges for the college's own development and academic construction.

In summary, the construction of the intelligent connected vehicle experimental platform at University of Sanya is feasible in many aspects. Factors such as climate and environmental advantages, school-enterprise cooperation basis, teacher team support, technical basis and equipment resources, policy and support environment, and market and application prospects all provide strong support and assurance for the construction of the experimental platform. Through the construction of the experimental platform, the college can not only enhance its scientific research level and teaching ability but also make a positive contribution to the development of the intelligent connected vehicle industry.

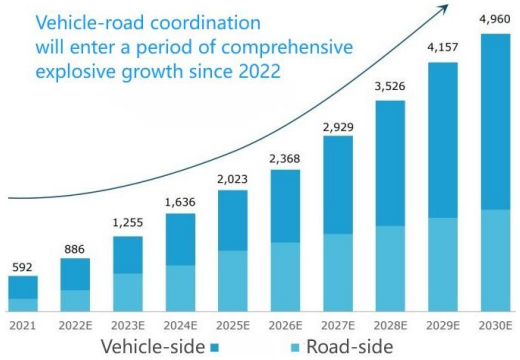

Figure 1. Forecast of China's Vehicle-Road Coordination Market Size (2021-2030) (in billion yuan)

4. Content and Methods of Experimental Platform Construction

Adhering to the principles of "school enterprise cooperation, complementary advantages, and combination of software and hardware", we aim to create a model of industry university research cooperation. The construction of University of Sanya's Intelligent Connected Vehicle Laboratory and Intelligent Connected Driving Testing and Evaluation Base will form a demonstration area for intelligent connected testing that benchmarks domestic standards. V2X scenarios such as lane keeping assistance, automatic emergency braking, green wave speed guidance, obstacle recognition, speed limit recognition, road construction warning, traffic signal recognition and response, traffic light speed guidance, designated bus stops (unmanned delivery machines), and unmanned commercial vehicles for sale (timed and designated cruising, waving and stopping) will be constructed, and a scene intelligent control system will be built to meet the intelligent control level of school vehicle road coordination scenarios. At the same time, it can undertake the intelligent driving testing work of Geely Commercial Vehicle Research Institute, provide scene libraries and related research topics for joint research, and complete the school's layout in vehicle road collaboration technology strategy.

Vehicle road collaboration is essentially achieved through the intersection and integration of multiple technologies, using wireless communication, sensor detection, and other technological means to comprehensively perceive human, vehicle, and road information, and play a collaborative role to achieve safety, efficiency, and environmental protection in transportation[13][14].The key implementation steps can be divided into four stages: vehicle end, roadside end, communication network, and application platform, as shown in Figure 2.

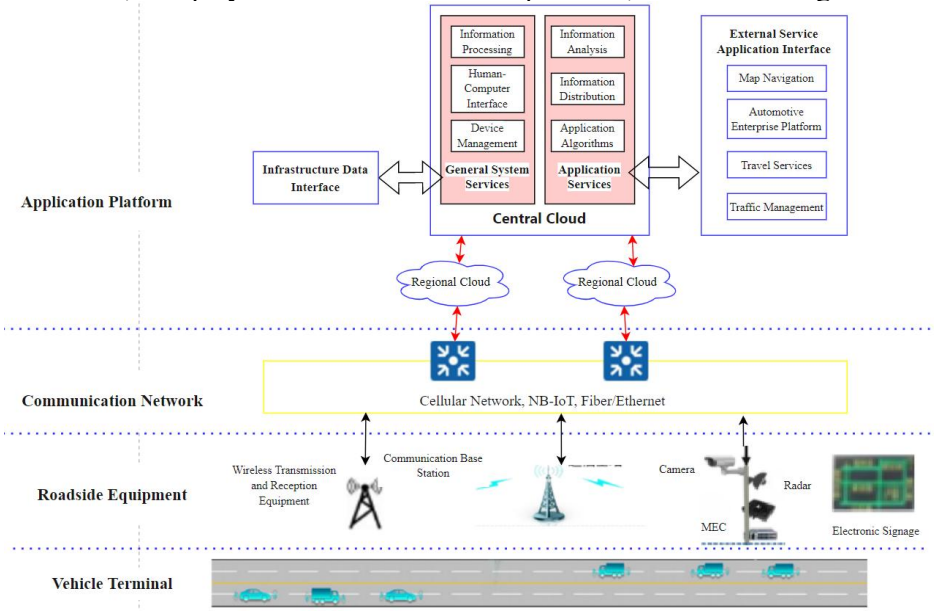

Figure 2. Vehicle-Road Coordination

4.1 Vehicle End Construction

Geely Commercial Vehicle Research Institute will sponsor the construction of the Intelligent Connected Vehicle Laboratory Center at our university with an unmanned test vehicle worth approximately 1 million yuan. The vehicle models include buses, vans, and shuttles. In addition to the vehicles, the laboratory center needs to purchase related retrofitting equipment, including radars, cameras, advanced driver-assistance modules, and industrial PCs, to achieve vehicle intelligence.

Furthermore, it is necessary to purchase equipment to retrofit existing vehicles into mapping vehicles, as shown in Table 1, including (1) laser radar; (2) RTK + integrated inertial navigation; (3) cameras; (4) data collection industrial PC.

4.2 Roadside End Construction

The roadside end construction involves retrofitting sections of roads and intersections with equipment for environmental monitoring and data transmission to interact with the vehicle end. The equipment required for the roadside end is listed in Table 2, including roadside perception devices, intelligent traffic devices, and calibration kits.

4.3 Communication Network Construction

The communication network mainly includes: (1) construction of 5G base stations; (2) construction of RTK positioning base stations; (3) on-board OBUs; (4) switches: to build a local area network, as shown in Table 3.

4.4 Application Platform Construction

The laboratory will specifically conduct research on projects including V2X, full perception, data analysis and simulation testing, building a campus scenario library for University of Sanya, VTD building laser radar/camera models, and point cloud map construction, as shown in Table 4. Combining the college's teacher research projects, data processing, image recognition, path planning, intelligent decision-making control, and vehicle-road-cloud perception fusion-related research work will be carried out to provide differentiated and customized services based on various industrial needs. This will support numerous functions such as networked high-level autonomous driving, blind spot warning, real-time monitoring, remote control, optimal

path planning, and network security monitoring. After the test and evaluation base is constructed, the college will actively apply for relevant qualifications to prepare for future opening to related social groups to meet their testing venue needs.

Table 1. Vehicle End Construction Equipment

Name	Quantity	Estimated Unit Price (yuan)	Equipment Purpose and Function	Main Core General Technical Parameters
Vehicle and Retrofitting	1	1,000,000	Test vehicle and retrofitting costs	Buses, vans, shuttles, etc.
Laser Radar	1	160,000	Used for mapping vehicles to scan the environment and collect road data, output point cloud maps, and support subsequent high-precision map production	Mechanical laser radar, 128 lines
RTK + Integrated Inertial Navigation	1	30,000	Used for mapping vehicles for positioning, enabling point cloud mapping, and supporting subsequent high-precision map production	Integrated navigation positioning
Camera	6	5,000	Used for mapping vehicles to collect road environment data	4K, 30 frames
Data Collection Industrial PC	1	35,000	Used for mapping vehicles to collect point cloud data and video data, achieve time synchronization, and support subsequent high-precision map production	PCIE bus, GSML2 collection card, m.2 interface hard disk, supports multi-channel laser point cloud data and camera collection
Industrial PC	1	64,830	For single-vehicle intelligent driving development and application	Industrial PC with A800 GPU
Vehicle Bracket	1	3,000	Used for mapping vehicles to fix laser radar, cameras, and data collection industrial PCs	Custom bracket

Table 2. Roadside End Construction Equipment

Name	Quantity	Estimated Unit Price (yuan)	Equipment Purpose and Function	Main Core General Technical Parameters
Calibration Kit	1	160,000	Calibration kit for sensor calibration	Checkerboard target, QR code target, calibration cloth, total station, target bracket, laser rangefinder, etc.
Roadside Perception Devices	5	275,000	Perception devices for traffic environment and road traffic status, used for roadside perception to collect real-time roadside data and support full perception applications	Supports at least 6 point locations, including millimeter-wave radar, laser radar, cameras, and edge computing terminals
Intelligent Traffic Devices	2	215,000	Used for scheduling and control, enabling traffic signal control and supporting scheduling application research	Includes 8RSU, 1signal controller, 1traffic light, 1pan-tilt-zoom camera, 1*high-precision positioning base station

Table 3. Communication Network Construction Equipment

Name	Quantity	Estimated Unit Price (yuan)	Equipment Purpose and Function	Main Core General Technical Parameters
5G Base Station	1	500,000	To cover the closed campus area	Coverage radius of at least 200-250 meters

Switch	1	5,000	To build a local area network	24-port industrial switch
RTK Positioning Base Station	1	780,000	To provide positioning services for roadside devices, intelligent traffic devices, mapping vehicles, and test vehicles	Coverage radius of at least 5 kilometers
On-board OBU	1	28,000	On-board OBU for communication with roadside devices	Supports 5G communication, C-V2X protocol stack, high-precision satellite positioning, built-in HSM module, supports CAN, Ethernet, WiFi, etc.

Table 4. Application Platform Construction Equipment

Name	Quantity	Estimated Unit Price (yuan)	Equipment Purpose and Function	Main Core General Technical Parameters
RTK Service for One Year	5	3,600	Designated base station RTK service	Provides positioning services for vehicles
Cloud Service for One Year	1	300,000	GPU resources, data storage, data processing	Enhances computing capabilities
Server	4	20,000	To provide a simulation environment and support joint simulation	i7 processor, each with GTX3080/3090 graphics card, 32GB memory, 250GB solid-state drive + 1TB hard disk drive
Autonomous Driving Scenario Simulation Software (University Edition)	1	480,000	Supports complex road network modeling, including irregular intersections, turns, slopes, super-elevations, and roadside structures such as tunnels and bridges; supports dynamic real-time lighting, HDR rendering, and road surface rendering; supports integration and application of various vehicle dynamics; supports OpenX import; supports customer-defined sensor modeling; provides free maintenance for one year; provides at least 2 trainings	Provides autonomous driving simulation testing
Storage Disk Array	1	150,000	To provide large-capacity storage for disk arrays	Supports at least 24 hard disk drive insertions

5. Objectives of Experimental Platform Construction

5.1 Quality Objectives

Referring to the standards of domestic advanced intelligent driving test experimental zones, we aim to create a fully functional and expandable intelligent connected vehicle experimental platform[15]. This platform will meet the teaching needs of the school by providing comprehensive services for practical teaching, scientific research innovation, and technology development. In terms of teaching, it will support related professional courses to help students better understand and master intelligent connected vehicle technology. In terms of research, it will closely cooperate with Geely Commercial Vehicle Research Institute and other related automotive companies to carry out intelligent driving test evaluation work, providing data

support and solutions for corporate technology research and product optimization. Relying on the experimental platform, we will promote the cross-integration of multiple disciplines such as vehicle engineering, communication engineering, computer science, and measurement and control technology. We will build a "campus practical training + disciplinary research" talent cultivation model to train high-quality talents with interdisciplinary knowledge and comprehensive practical abilities.

5.2 Performance Objectives

We will deeply cooperate with well-known companies such as Geely Group to carry out practical teaching projects in intelligent connected vehicles. We will introduce vehicle-road coordination-related technologies, intelligent decision-making control algorithms, and IoT communication into practical teaching, allowing students to gain experience in actual projects and improve their practical and innovative thinking abilities. We will cultivate professional talents that meet the development needs of the intelligent connected vehicle industry for companies, including autonomous driving simulation test engineers, big data and algorithm engineers, automotive electronic engineers, etc., providing human resource support for the rapid development of companies.

We will cooperate with Geely Group in intelligent driving tests, undertake corporate testing tasks, and provide actual project backgrounds and data support for talent cultivation. At the same time, through cooperation projects, we will promote exchanges and cooperation between university teachers and corporate engineers to jointly carry out technology research and innovation. We will carry out publicity and education activities on the current situation and trends of vehicle-road coordinated development in Hainan Province to enhance the public's understanding and awareness of intelligent connected vehicle technology. We will organize professional teachers and student teams to go deep into local communities, schools, and enterprises to conduct technical lectures and demonstration displays to promote the application and popularization of the technology.

We will carry out key technology joint attack horizontal research projects with enterprises for teachers interested in intelligent connected vehicle research at University of Sanya. We will encourage teachers to actively participate in corporate technology research projects to enhance their scientific research capabilities and engineering practice levels. Through the construction and operation of the experimental platform, we will strive to obtain multiple research project approvals in the field of intelligent connected vehicles, including corporate key technology joint attack projects, Hainan Provincial Natural Science Fund projects, key research and development projects, etc. We will publish high-quality academic papers, apply for software copyrights and patents, and enhance the academic influence of the university in this field.

5.3 Capability Cultivation Objectives

Through practical operations and experiments on the experimental platform, students will be able to master the installation, commissioning, maintenance, and usage methods of intelligent connected vehicle-related equipment, such as the calibration and data collection of sensors like laser radar, millimeter-wave radar, and cameras, as well as the programming and testing of autonomous driving controllers[16]. We will carry out practical teaching projects and competitive activities to involve students in the actual development of intelligent connected vehicles, improving their ability to solve practical problems and engineering practice skills.

On the experimental platform, we will encourage students and teachers to conduct innovative research, exploring new technologies, methods, and applications for intelligent connected vehicles. For example, researching new environmental perception algorithms, intelligent decision-making control strategies, vehicle-road coordination communication protocols, etc., to cultivate students' innovative thinking and capabilities. We will cooperate with enterprises to conduct cutting-edge technology research, allowing students to understand the latest industry technology trends and inspire their innovative inspiration and entrepreneurial awareness.

The construction projects and experimental tasks of the experimental platform require

participation from students and teachers with multidisciplinary backgrounds, and the project goals are achieved through team cooperation. In the cooperation process, we will cultivate students' team spirit and communication skills, enhance their role awareness and sense of responsibility in the team. We will organize students to participate in intelligent connected vehicle-related competitions and activities, such as the National College Students Intelligent Connected Vehicle Competition, China International "Internet Plus" College Students Innovation and Entrepreneurship Competition, etc., to exercise students' cooperation and competitive awareness in team competition.

The experimental platform covers multiple technical fields of intelligent connected vehicles, including environmental perception, decision-making and planning, control execution, data analysis, simulation testing, etc. Through learning and practice on the platform, students will be able to master the comprehensive application methods of these technologies and have the ability to integrate and optimize intelligent connected vehicle systems[17]. We will cultivate students' ability to apply their knowledge to solve practical problems, enabling them to design and develop intelligent connected vehicle solutions for different application scenarios and needs, providing technical support for enterprises and local economic development.

6. Testing and Evaluation of the Experimental Platform

6.1 Test Plan Design

Develop a comprehensive test plan, including test objectives, test content, test methods, and test scenarios[18]. Design corresponding test cases for different functional modules and technical characteristics of intelligent connected vehicles to ensure the coverage and effectiveness of the tests.

Establish a test scenario library that covers various typical traffic scenarios, such as urban roads, highways, rural roads, and special scenarios (such as adverse weather, construction sections, etc.). Use scenario simulation tools to generate virtual test scenarios and combine them with actual road testing to fully validate the experimental platform.

6.2 Assessment Indicator System

Construct a scientific and rational assessment indicator system to measure the performance of the experimental platform and the maturity of intelligent connected vehicle technology[19]. The assessment indicators include safety (such as collision avoidance capabilities, braking distance, etc.), reliability (such as system failure rate, sensor stability, etc.), comfort (such as acceleration smoothness, steering precision, etc.), efficiency (such as driving speed, path optimization effect, etc.).

Based on the assessment indicator system, establish a quantitative assessment model to objectively and accurately evaluate the test results of the experimental platform. Through data analysis and processing, identify technical bottlenecks and issues to provide a basis for technological improvement and optimization.

7. Conclusion

The construction of the intelligent connected vehicle experimental platform is of great significance. By building a fully functional and expandable experimental platform, we can provide strong practical support for the school's teaching, effectively promote the development of teaching informatization and academic discipline construction. At the same time, the platform also provides advanced experimental conditions for researchers to conduct intelligent connected vehicle technology research, helping to enhance teachers' scientific research levels and innovation capabilities.

During the construction of the experimental platform, we have fully utilized University of Sanya's advantages in climate and environment, leveraged the close cooperation with enterprises such as Geely New Energy Commercial Vehicle Research Institute, and relied on the professional knowledge and practical experience of the teacher team to ensure the smooth progress of the experimental platform construction. Through the operation of the experimental platform, we expect to achieve significant results in talent cultivation, technological innovation, and industrial services. We will cultivate high-quality professional talents in the field of intelligent connected vehicles, promote

technological progress and application development, and realize the deep integration of education and industry. In the future, we will continue to improve the functions of the experimental platform, strengthen cooperation with enterprises, deepen industry-education integration, and make greater contributions to the development of the intelligent connected vehicle industry.

Acknowledgments

This paper is supported by Research and Practice on the Talent Cultivation System of Deep Industry Education Integration in the Field of New Energy Vehicles Guided by Product Thinking (No.Hnjg2024ZD-52) and Research on Exploratory Experimental Platform for Autonomous Driving Technology under the Background of Industry Education Integration (No.USY-CJRH2324).

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