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Research on Legal Risks and Legal Regulations of Autonomous Driving from the Perspective of Civil Law

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Abstract
In recent years, artificial intelligence has been widely used in various fields of social production and daily life. Methods to promote artificial intelligence and its active integration into social life has caused fierce disputes in the scientific and technological circles and legal circles. Autonomous driving technology is a type of artificial intelligence technology. As these technologies have achieved breakthrough development, the risks of legal subject qualification and legal liability also follow. Regarding the issue of liability for the damages caused by autonomous driving, the current legal system does not involve this aspect. Whether autonomous vehicles can be applied to the determination of tort liability for traditional vehicles is worthy of in-depth discussion in the academic community. This article analyzes the possible legal risks of autonomous driving from the perspectives of legal subject qualifications, tort liability, and privacy rights. Moreover, it assesses approaches to regulate the corresponding risks from the perspectives of ethics, responsibility sharing, and privacy protection to promote the healthy development of autonomous driving.
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1. Introduction

In the 1970s, developed countries in Europe and the United States began to invest in research on autonomous vehicles. Since then, they have made huge progress in driving technology from theoretical concepts to practical and feasible solutions. China started its research on autonomous vehicles in the 1980s. From the first autonomous vehicles in the 1990s to the present, the technology has gradually become more mature. For instance, Baidu president Li Yanhong drove an autonomous vehicle on the Beijing's Fifth Ring Road. In addition, the National Development and Reform Commission released the Smart Car Innovation Development Strategy (Draft for Comment). Meanwhile, Google's autonomous vehicles have driven nearly 3 million kilometers, while Alphaba's intelligent driving buses, with L3+ level operation capabilities, have also been deployed in Shenzhen, Zhangjiajie, Wuhan, Hefei, and other cities. The development of autonomous vehicles is an important path to conform to ecological and green development and promote the transformation of the automobile industry.

The difference between autonomous driving and traditional driving technology is the integration of emerging technologies, such as big data and the Internet of Things. Autonomous driving is a product of a new era of driving mode and belongs to high-level autonomous driving technology. In January 2016, a Tesla car in the Handan section of the Beijing-Hong Kong-Macao Expressway in Hebei Province suffered a rear-end collision due to the driver turning on the Autopilot (Tesla's autopilot system) technology. The Tesla car was damaged on the spot, and the 23-year-old male driver died unfortunately. In May 2016, when former US Navy SEAL soldier Joshua Brown enabled the Autopilot function in his vehicle, he suffered an accident and eventually died. In the United States in 2018, Uber's road test vehicle failed to identify a woman cyclist and killed the woman. Other examples of the autopilot feature causing casualties, as well as various technical failures, have been reported. In 2016, Google conducted a two-month road test of self-driving cars. According to the records, 272 of them were required to be manually driven to re-control the vehicle due to technical problems, and 13 drivers were forced to control the vehicle by manually driving it to prevent accidents. In addition, technical failures have been recorded, such as Mercedes-Benz's cruise control failure and the collision of Google's self-driving car with a bus.

Frequent accidents push autonomous driving cars to the forefront. Legal issues have been brought about by autonomous driving cars, such as the driving right of autonomous vehicles and the subject of penalties for violations, and autonomous driving cars' liability determination for traffic accidents or accident compensation for damages caused by death and other factors. With the development of autonomous driving cars, content related to tort liability has begun to appear in the formulation of laws.

In June 2017, Germany's Road Traffic Law was revised, and the tort liability of smart cars was systematically regulated. The law in the United Kingdom is more open. In the Autonomous and Electric Vehicles Act of 2017, the first part of the bill touches on the core legal issues of autonomous driving and makes special provisions and amendments on the liability and insurance issues of autonomous driving. The provisions of compulsory insurance are included. Moreover, self-driving cars are under the insurance contract and enjoy the

same insurance status as traditional cars. The promulgation of these laws is an advancement at the legislative level. However, given the insistence on maintaining the current tort liability system, a conservative side also plays a role in the issue. The existing domestic and foreign legislation does not solve the legal status of autonomous vehicles nor does it properly solve the problem of human damages caused by autonomous vehicles. In China's traditional Product Liability Law or regulations on product liability, the application is already stretched as far as driving is concerned. This article asserts that the challenges of autonomous vehicles to the current civil law must be analyzed from the perspectives of the legal status of autonomous vehicles, tort liability, civil subjects, and privacy rights. Moreover, research must be conducted on how we can deal with these challenges to contribute to the rapid development of autonomous driving and effective government supervision and to seek balance.

2. Definition of Autonomous Driving and Related Research

2.1 The meaning and scope of autonomous driving

According to the International Association of Automotive Engineers, the level of autonomous driving is classified according to the degree of automation, from low to high in order from 0 to 5, respectively. Level 0 automatic driving means that the system does not participate in continuous driving tasks and only serves as a driver under certain circumstances. Hence, the driver provides assistance and participates in driving. At this time, driving at this level cannot be called automated driving. Level 1 automated driving only provides certain control assistance under restricted conditions and specific situations. It is mainly an assisted driving system that aids human drivers. The main driving task is still completed by a human driver. Level 2 automatic driving can be said to have started an automated process. It can be defined as partial automation. However, it is still considered assisted driving. The main task of the level-1 human driver is to complete the main task. The steering requires only a human driver, and timing intervention is involved. Level 3 automatic driving means that once the car starts to run, it will enter a fully automatic driving state. This stage can be called the actual automatic driving level, which can be defined as conditional automatic driving. Drivers must be vigilant to a certain extent and take over the car when the system prompts intervention. Level 4 automatic driving generally does not require human driver intervention. Unless special circumstances occur, this state is considered highly automatic driving. Level 5 automatic driving means that automatic driving can perform any driving task that humans do. Thus, it is classified as completely automatic driving. No human driver intervention is required at any time.

As can be seen from the above description, unmanned driving is a high level of autonomous driving, which has been classified under level 4 and level 5. Many of the existing works that focus on autonomous driving or unmanned driving are absolute; one strand concentrates on unmanned driving, and the other highlights autonomous driving. The existing literature basically focuses on unmanned driving. At this time, unmanned driving refers to high-level automatic driving and fully automatic driving. It does not include conditional automatic driving, which is not yet covered by the law. If unmanned driving is adopted as the object of legislation, it will still make conditional autonomous driving a blank area of legislation. Therefore, this research asserts that autonomous driving is broader than unmanned driving. The third level of autonomous driving is already considered conditional autonomous driving. However, the behaviors of people and vehicles are more complicated. Hence, this complexity should be included in the law or policy supervision range. Therefore, the research object of this work refers to autonomous vehicles above level 3, not self-driving vehicles.

2.2 The current status of legislation on autonomous vehicles in major countries in the world

Facing the impact of autonomous vehicles on social public safety, countries around the world have adopted legislation, policies, guidelines, and standards to establish a regulatory mechanism for driverless cars. The existing legislative system worldwide is mainly divided into three factions: the open attitude of the United States; the relatively conservative attitude of Europe; and the neutral attitude of China, Japan, and South Korea.

2.2.1 Legislative practice in the United States

The world's leader in the development of autonomous driving technology is the United States. Although this development is deeply affected by the country's laws and regulations, the legislative progress has not been smooth sailing. The first law that involved autonomous driving was Act No. 511 of the Transportation Committee of the State of Nevada in 2011. However, the object of this regulation only covers the problems that high-tech companies have in the field tests of autonomous vehicles, including the test conditions, methods to regulate them, and other restrictive measures. Then, in 2012, California introduced the Self-Driving Cars: Safety and Performance Requirements Act. Compared with the Nevada Act, the biggest contribution of the Act is that its legislative purpose is to promote and protect the safety of autonomous vehicles.

Subsequently, more than 20 states in the United States have initiated legislations on autonomous vehicles. This trend has also accelerated the development of autonomous driving technology in the United States and promoted the development of the entire industry chain of autonomous driving. However, the most relevant regulation to new issues, such as autonomous driving responsibilities, is the Guidelines for Autonomous

Vehicles issued by the National Highway and Traffic Safety Administration in September 2016. For the first time, this act deleted the mandatory requirements for autonomous vehicles on the road. The driver's request stipulates that the main means of solving the problem of self-driving cars is the tort law of each state. The size of the ultimate liability will also vary according to the tort liability laws of each state, such as liability for fault, liability for no fault, and liability for strict fault.

2.2.2 Legislative practice in Europe

Under the impact of artificial intelligence technology and autonomous driving technology, the traditional automobile manufacturing industry is struggling to develop. France and Britain successively announced development roadmaps for autonomous vehicles, namely, the Ecological Transformation Act and the Vehicle Technology and Aviation Act in 2014 and 2015, respectively. These roadmaps have been created to conform to the historical trend, promote the development of autonomous driving technology, maintain the advantages of the automobile manufacturing industry, and clear the policy and legal obstacles to the development of autonomous driving technology. More legislative forms have been proposed, and the combination of legislation and orders has been adopted to promote the revision of relevant laws and regulations for autonomous driving and quickly realize the standardized development of autonomous vehicles. The biggest contribution of these documents is related to the core and principle issues in autonomous driving, that is, the allocation of responsibilities for traffic accidents. Subsequently, Germany passed the Self-Driving Vehicle Legal Guidelines in 2017. This policy mainly recognizes the dominant status of autonomous vehicles and allows manufacturers to test autonomous vehicles on the road. Notably, such testing is subject to a series of restrictions. At the same time, it clarifies the responsibility of the manufacturer and the driver when an accident occurs. It has also become the main responsibility distribution measure for the current automatic driving.

2.2.3 Legislative practice in Japan and South Korea

Asia's main attitude toward autonomous driving is to follow the development of European and American countries. The region puts a considerable amount of energy into the development of autonomous driving technology and legal regulations. Moreover, it pays great attention to progress, always maintains a cautious attitude, and aims to promote the development of autonomous vehicles.

To recognize the dominant status of autonomous driving vehicles, Japan formulated the Roadmap for the Popularization of Autonomous Driving in 2015. However, it did not touch on the issue of liability determination for traffic accidents. Subsequently, the Japanese Police Department expanded the scope of insurance in the Rules for Testing Unmanned Vehicles on Highways by including autonomous driving as the object of insurance. The regulations stipulated that traffic accidents caused by autonomous vehicles should be included in the scope of insurance compensation. This rule only applies to self-driving cars during testing. Meanwhile, South Korea stipulates that functional departments in the government should carry out preliminary development planning and seminars for self-driving cars. Moreover, they should discuss and modify the current Automobile Management Law and the rules that conflict with the development of self-driving cars. Then, these departments should propose measures to ensure the development these vehicles. These actions can contribute to the commercialization process of the self-driving car industry.

2.2.4 Enlightenment of foreign law and regulation of unmanned vehicles

Judging from the process and reality of foreign legislation, the current self-driving car technology in countries around the world is mainly still in the evaluation and testing stage. Hence, it has not yet entered the substantive commercialization stage. Most European countries and the United States have adopted different attitudes. For example, although Germany recognizes the legal status of autonomous driving technology, the country requires a qualified driver to be in the car to monitor it. However, the United States has not imposed too many restrictions. It only stipulates that autonomous driving at level 3 and below must have a driver in the car. Meanwhile, higher-level autonomous vehicles do not require a licensed driver.

Autonomous driving has become increasingly closely related to human life. As the degree of integration into human life rises, the expectations of humans for the development of autonomous driving technology increases. Hence, the demand for the development of autonomous driving technology becomes more urgent, and the conflict between the development of autonomous driving technology and the backwardness of legal regulations will become more prominent. Taken together, countries around the world have different attitudes toward autonomous driving. However, from the experience of various countries, we can learn from the following points. The administrative regulations of driverless cars show the characteristics of global governance and regulation convergence. For manufacturers all over the world, these characteristics can eliminate the differences in national standards and effectively reduce the production costs of autonomous vehicle manufacturers. Meanwhile, the convergence of rules will also strengthen the competition among world manufacturers. Whoever has the right to make the rules will occupy a more favorable competitive position. The legislation of autonomous vehicles is the normative guidance for autonomous driving within a country, and it also reflects the international right to speak of autonomous driving technology. China's autonomous vehicles should adopt different regulatory measures for various stages of technology in stages, that is, the unification of technology and its stages.

3. Problems in autonomous vehicles

3.1 Electronic human rights in the artificial intelligence era

As a representative technology of artificial intelligence, autonomous driving has been evaluated to demonstrate whether it has the same subject qualifications as human drivers. In the 1980s, the United States established a judiciary in Hawaii dedicated to predicting changes in future cases, studying future legal issues, and focusing on the rights of robots. In contrast, the research and discussion on robot rights in China is relatively late. Chinese scholars have begun to pay attention to the rights of robots and have formed some new opinions. First, they speculate on the right to life of robots, whether robots enjoy these rights, and their ability to protect themselves from infringement by laws, that is, whether they have electronic personality. Second, in the future, the use of robots instead of heavy human labor will become a trend. Hence, the issue on whether robots have the right to freedom and avoid engaging in servile labor for a long time will emerge. Third, robots have the ability to learn. When they have a certain sense of happiness, they can enjoy the right to pursue happiness, just like the love manifested by the robot David for his mother in the movie Artificial Intelligence, that is, they have certain civil rights.

To what extent and in what sense can autonomous vehicles be called “moral subjects”? This question is the embodiment of robot electronic personality rights applied to autonomous vehicles. First, the issue lies on whether autonomous vehicles will follow some moral principles followed by humans, such as utilitarianism or absolute moralism. If autonomous vehicles have these principles, then they will have a certain moral action force similar to that of a natural person. In such case, these entities can obtain the status of moral subjects. Second, autonomous vehicles will become moral subjects. What does this status mean for autonomous vehicles? When autonomous vehicles become moral subjects, which are evidently different from human moral subjects, their status as subjects will differ from that of humans. Finally, the key to the problem is whether the differences in personality and ability between autonomous vehicles and human drivers should become an important dimension of future legislation.

3.2 The privacy of autonomous vehicles

Autonomous vehicles have the technology of collecting and recording accident-related data, which is of great significance for autonomous vehicles with certain learning ability to improve their safety. However, these data may also be obtained by manufacturers or other entities to test, operate, and improve driving safety. In 2018, the EU launched a vote, one of which was that “data generated by autonomous vehicles are automatically generated and are essentially not creative and therefore not applicable to copyright protection or database rights.” This new rule can be understood as manufacturers being able to collect data generated by autonomous vehicles and sell them to insurance, marketing personnel, and advertising companies without the consent of the owner of the autonomous vehicle. This information may contain some personal private data, such as GPS information. Hence, this disclosure is evidently unreasonable. Clear regulations must be set to determine certain privacy aspects, including which information can be attributed to the manufacturer and which information belongs to the owner.

Autonomous vehicles have a high degree of automation. Therefore, network security must particularly be ensured. The core of network security is to minimize the risks caused by network security threats and vulnerabilities. Before these incidents occur, manufacturers or other entities should eliminate potential risks and threats through detection, identification, and protection. At the same time, when the accident occurs, the data are recorded, which can provide a basis for the subsequent division of responsibilities. Moreover, the absence of accident data support will lead to unclear responsibilities. When an accident occurs, the collection of data by the automotive system is the basis for the allocation of responsibilities. In addition, records are required for communication among drivers, manufacturers, and software providers to clarify responsibilities.

3.3 The tort liability caused by autonomous vehicles

Regarding the responsibility of traditional motor vehicle traffic accidents, the problem of responsibility judgment and commitment can be well solved under the existing Road Traffic Safety Law and Tort Liability Law. However, autonomous vehicles have a high degree of autonomy and independent decision-making ability, which are almost beyond human driving behavior. Therefore, the laws regarding traditional traffic accidents in accordance with the standard of fault degree and duty of care are difficult to apply to autonomous driving. The main challenge lies in the following:

(1) The subject of responsibility is difficult to determine

Most previous studies have directly recognized that autonomous vehicles have the subject qualification of human drivers. However, they have ignored an important issue in civil law: the relationship among legal personality, property, and responsibility. Autonomous vehicles is classified according to the grade. A higher grade indicates less human driver participation in driving until it reaches 0, which basically entails that the human driver’s participation is not required. Therefore, when a traffic accident happens, determining the responsible entity is a difficult and important problem. The main body responsible for the accident should be concentrated on the

"invisible driver" of autonomous vehicles and other main bodies responsible for making this driver. These parties may include vehicle owners, suppliers of autonomous driving systems, manufacturers of autonomous vehicles, and hardware and software providers. The responsible subject has too many objects, thus increasing the difficulty of identifying the responsible entity after the accident [8].

(2) The traditional imputation principle is difficult to apply

According to the traditional road traffic safety law handling the principle of motor vehicle accidents, most of the regulations are based on fault liability and are determined according to the impact of personal behavior on accidents. In autonomous vehicles, human beings rarely participate in driving behavior. No humans are even involved in higher-level autonomous driving. Thus, the degree of fault cannot be measured. However, autonomous vehicles rely on machine learning to reconstruct new data with existing knowledge and improve their own performance. Therefore, they do not solely operate according to their preset program. The occurrence of tort liability in autonomous driving mode may not be due to the problems of the software and hardware themselves, thus complicating the application of the fault-based imputation principle. If we continue to use the traditional fault-sharing principle, the owners of autonomous vehicles still bear no more than 10% of the responsibility, as no supervisor errors are involved. This scenario is not only not conducive to the research and innovation of autonomous driving technology but also runs counter to the original intention of autonomous driving development and legislation.

(3) Product defects are difficult to identify

Given the high complexity of autonomous driving technology, product defects are difficult to identify after accidents of autonomous vehicles. The main reasons are as follows. First, the intelligence of self-driving cars gives them certain learning and decision-making abilities. After an accident, identifying product defects as the cause can be challenging, and the identification process requires a lot of time and high costs. Second, Article 41 of the Product Quality Law stipulates that the producer shall be liable for compensation for personal injury or damage to property other than defective products. However, if the product is not in circulation or put into circulation, the defect-causing damage does not officially exist yet. In addition, the level of science and technology at the time of putting the product into circulation is not enough to find the defect. Hence, the producer shall not be liable for compensation. For autonomous vehicles, the complexity and advancement of technology make product manufacturers invoke this clause to avoid liability. At the same time, the autonomous decision-making ability of automatic vehicles is based on their own learning ability and does not follow the general process of human decision-making. Therefore, their behavior is unpredictable to some extent. When judging the accident response, no absolutely reasonable state emerges. For various behaviors of autonomous vehicles, defects in products are difficult to identify directly.

4. Principles and countermeasures of sharing liability for infringement of autonomous vehicles

4.1 Revise relevant laws to resolve subject qualifications

Countries, such as the USA and Germany, have responded positively to the legal challenges brought by self-driving cars. At present, China has not officially issued laws related to self-driving cars, and the Highway Law and the Implementation Regulations of the Road Traffic Safety Law have also made some restrictions on the road test of self-driving cars. China included autonomous vehicle supervision and legislation on its agenda at the end of 2017. Local cities, such as Beijing, Shanghai, and Chongqing, took the lead in issuing relevant policy documents. Subsequently, the Ministry of Industry and Information Technology, the Ministry of Public Security, and the Ministry of Transport issued the Rules for the Management of Road Test of Intelligent Connected Vehicles (Trial), which became a national legislation to regulate the road testing of autonomous vehicles. However, some existing policies and regulations still need to be adjusted in time to seize the commanding heights in the international competition of autonomous driving.

In addition, the motor vehicle registration system has been implemented in China. Currently, no unified safety standard for autonomous vehicles exists. The current Technical Conditions for Safe Operation of Motor Vehicles need to be adjusted according to the development of autonomous driving technology. Otherwise, the lack of technical standards cause difficulties in guaranteeing the safety of autonomous driving vehicles and affect the commercialization and industrialization of autonomous driving technology.

4.2 Revise the Product Quality Law and Tort Liability Law to determine the principle of liability and the subject of liability

The traditional rules and principles of autonomous driving are mainly based on the type and degree of participation of the driving subject to determine the principle of liability. When a traffic accident occurs between autonomous vehicles, the principle of no-fault liability applies. In addition, the principle of liability for fault applies between autonomous vehicles and ordinary motor vehicles, while the principle of presumption of fault applies between autonomous vehicles and non-motorized vehicles or pedestrians.

As the representative of artificial intelligence products, self-driving cars' biggest difference from traditional

cars is that when faced with numerous complex situations in the road environment, self-driving cars can learn by themselves to complete various complex tasks. The "rationality" of self-driving cars is reflected in the judgment and selection of road conditions and emergency handling of special situations. Moreover, the legal normative significance of self-driving cars lies in the attribution of liability in the event of infringement rather than the prior conduct of their actions. Guidelines. Given the heterogeneity of smart cars relative to traditional cars in the autonomous driving mode, infringements may occur even if other responsible parties fulfill their obligations. At this time, the automatic car should be the main responsible body, and having this liability is a manifestation of the vehicle's electronic personality. When manufacturers, developers, and drivers are negligent, they should be recognized as responsible.

4.3 Expand the scope of insurance contracting and establish a compensation mechanism centered on insurance companies

The traditional compulsory traffic insurance is provided to motor vehicles involved in traffic accidents. They are given certain compensations, including those for the victim and property damages. However, drivers and passengers of self-driving cars are evidently not within this scope. Therefore, a new insurance framework should be established to include product liability into the insurance framework so that victims can obtain compensation directly from the automobile insurer. On the basis of the corresponding terms, the underwriter can recoup from the subject that bears product liability in accordance with the law. In the meantime, the main responsibility of the insurance company depends on the "technical accident" to the product. For other modern emerging technologies, software bugs, and satellite malfunctions, the insurance company and the subject of insurance may make separate agreements.

Insurance is an important system for cars. As the level of autonomous driving improves, drivers will be required to buy certain insurance policies to cover the cost of an accident in a self-driving car. When entering a higher level of autonomous driving, it can consider establishing a compensation fund or giving autonomous driving a certain legal personality combined with the insurance system so that it can directly bear the responsibility. The main idea is to consider setting up a compensation fund to ensure that uninsured damages can be covered for autonomous vehicles covered by the fund. When the specific liability share is difficult to determine, the manufacturer and developer shall assume limited liability, while the remaining liability shall be assumed by the autonomous vehicle and paid by the compensation fund.

4.4 Tort Liability from the Perspective of Self-Driving Car Ethics

To explore the specific ethical rules of autonomous driving, we must first realize that the future development of autonomous driving technology is always surrounded by ethical disputes between human and machine. Although countries around the world are beginning to recognize the legal status of autonomous driving, no consensus has been made on the main path of future development and whether future technological advances could prohibit humans from operating cars. The new issue is that the safety of autonomous driving technology reaches a very high level, thus making traffic accidents a small probability event. Hence, the legal driver in the future is a legal issue worth discussing. Specifically, this work demonstrates that the specific ethical rules of autonomous driving should include the following aspects. (1) The priority options in the event of an accident must be clarified, as different interests have their own rationality. This rationality may be mutually exclusive, thus leading to moral or ethical dilemmas. From a legal point of view, persuasion without violating the interests of either party is difficult. When discussing ethical issues, the priority option is not the negative option, and the damage to the interests of any party is not encouraged because the interests of any party have rationality and legitimacy. (2) The principle that the protection of human life is above all else must be clarified. In the event of an accident in which the automatic driving car cannot avoid the scenario after exhausting all means and technologies, the protection of human life is still above everything else. This notion entails accepting damages to animals or property to avoid harm to humans within the framework of the law. In the human community, a strict ban must be implemented on the use of individual characteristics as a criterion for judging and on the discrimination of victims.

4.5 Privacy protection and data property rights issues of autonomous vehicles

Self-driving cars have powerful information-capture capabilities. With the assistance of various sensing and recording devices, self-driving cars have strong data collection capabilities. Various countries attach great importance to the privacy protection of self-driving cars. Therefore, they have issued special rules to clarify the privacy protection of self-driving cars. Generally speaking, existing privacy and data protection rules apply to these vehicles. According to foreign experience, we can incorporate data and privacy issues into the security report, establish a vehicle privacy database, and hide owner information. The vehicle identification number can be searched through the database instead .

To assign liability better, measures need to be taken to clarify whether an autonomous vehicle is an autonomous driving system or a human driver when an accident occurs. Therefore, data collection is an

indispensable evidence when assigning responsibility. These records not only include objective driving records, software operation records, and conversation and communication records between the human driver and the system. The data report of self-driving cars can also facilitate data sharing, reduce the safety risks of self-driving, and improve the overall industry level.

Depending on the type of data, different measures should be taken on the property rights of autonomous vehicle data. In general, countries around the world do not have a clear ownership of the data related to autonomous vehicles. On the basis of whether it contains personal information, it can be divided into personal data and non-personal data or anonymous data. The former has personal and property attributes, while the latter only has property attributes. Both the EU's Time Data Recorder Installation Benefits Research Report and the U.S. Federal Union Drivers Privacy Act stipulate that the first type of data collected by self-driving cars belongs to the owner of the vehicle, thus restricting outside access to the data. Moreover, only the owner has the authority to allow other entities to download the information. The second type of data belongs to non-personal data, which is owned by the data producer and can be accessed by a third party. When the data involves public interests, such as the environment, the data producer cannot exclusively use the information.

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