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The normative challenges of Autonomous Vehicles between equality and non-discrimination

Abstract

Autonomous Vehicles, cars equipped with tools able to operate and drive without human intervention, represent a significant technological innovation in the automotive industry and are soon expected to transform the field of mobility. The research aims at providing an analysis of AVs, examining the steps of their advancement and drawing particular attention to the ethical and normative implications of their introduction into society.

To address the most relevant issues related to such innovation, together with the range of benefits that will set driverless cars apart from conventional vehicles, the study first of all analyses their historical background. Subsequently, in order to understand the peculiarities the technology, it is analysed the taxonomy proposed by the Society of Automotive Engineers (SAE), which defines six levels of automation in AVs based on the amount of control that the vehicle can take over the driving task. The research draws then particular attention to the impacts on health and safety that might derive from the usage of driverless cars, investigating both the positive and negative aspects: the findings show that their adoption will hold great potential in society; however, if proper attention won't be given to equity, then the introduction of this innovation could worsen existing obstacles and contribute to inequalities. To prevent the latter case, the thesis stresses how the role of policymakers will be fundamental: in addition to ensuring a secure implementation of the technology, legislators will need to consider how AVs could benefit those who are most in need, in order to make a positive impact on their lives.

Moreover, also ethical considerations are posing substantial concerns regarding the widespread adoption of autonomous vehicles. The introduction of AVs will represent a significant milestone

in society as, for the first time in history, artificially intelligent systems will interact with humans in real-world settings, travelling at high speeds and on a large scale. Current literature on this matter primarily focuses on crash scenarios involving some kind of unavoidable damage, where an AV must make decisions about how it is preferrable to distribute such harm. In fact, when faced with an imminent collision, this technology may be forced to solve controversies that result in a tension between individual rights and a greater good, about which the *trolley problem* can be considered one of the most emblematical thought-experiment. Specifically, trolley cases are idealized scenarios where an individual, in the guise of an autonomous vehicle, is confronted with a choice between two actions, which will result in different distributions of unavoidable harm. The original trolley problem was first introduced by the English philosopher Philippa Foot in 1967, and later modified in 1976 by the American Judith Jarvis Thompson with the "switch" and "bridge" versions. The significance of these types of problems does not lie in equating autonomous vehicles with real-world trolleys, but rather in highlighting the challenging ethical decisions that AVs will have to face when introduced in the society. Indeed, unlike humans who rely on instinct, driverless cars are programmable and therefore, once introduced on the roads, they will require explicit instructions on how to act in such cases.

Continuing the study, another challenging question arises: should driverless cars also distinguish between different pedestrians, when assessing collision scenarios? Here it should be considered the principle of non-discrimination as expressed by the EU Charter of Fundamental Rights, Title III Article 21[1]: according to such principle, could this distinction be qualified as a discrimination on ground of age? There is still an ongoing debate concerning this particular topic, Moreover, lots of other questions still need an answer, especially in the assessment of liability: when transposed to real-life scenarios, such autonomous vehicles should also imply an analysis of responsibility for damages: who is going to be liable in the event of a crash? As AVs will progressively diminish the role of human drivers, there arises the challenging – but not impossible – need to create new effective regulations, as well as to adapt and update existing laws and their enforcement. Consequently, in particular in the European context, the exploration

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[1] "Any discrimination based on any ground such as sex, race, colour, ethnic or social origin, genetic features, language, religion or belief, political or any other opinion, membership of a national minority, property, birth, disability, age or sexual orientation shall be prohibited."

of research questions concerning the normative oversight of autonomous vehicles is becoming increasingly vital. Within agency issues in AVs, various stakeholders have been identified by the literature, including automobile companies, developers, owners and insurance companies, as well as policymakers and legislators. Nevertheless, in the event of an accident involving a driverless vehicle, the allocation of liability among these parties remains nowadays uncertain.

Considering the current international context, the thesis highlighted how German car manufacturers are actively competing for a global leading position in the realm of autonomous driving technology; during the last years, the German government and the automotive industries agreed on the fact that relevant laws need to go the same way, eventually implementing several measures to foster effective innovation in the field and to establish Germany's position in the innovation process. In particular, in 2016 the Ministry of Transport established the Ethics Commission on Automated and Connected Driving, which the following year presented its Ethical Guidelines, a document that played a significant role in shaping the fundamental Act on Autonomous Driving, later issued in 2021. Such ethical guidelines, organized in twenty points, addressed important aspects in the AVs field, including the challenging matter of inevitable crash situations and the ethics behind the complex concept of giving different values to lives based on personal characteristics. Wider safety concerns, inquiries into data utilization and the delineation of responsibilities were also discussed, encompassing principles of human dignity, non-discrimination and equality before the law. Later, in 2021 Germany further revised the Road Traffic Act with the introduction of the Autonomous Driving Act, establishing a legal framework for driverless systems operating within defined areas, specifically addressing vehicles at SAE level 4, and making ethical and liability considerations and data protection observations. The importance of this Act is unquestionable: Germany's legislation has cleared a path for regulating driverless cars on higher levels, serving as a model for other nations and leading the way in the future, being the first nation in the world to issue a normative framework for Level 4 AVs.

Globally, the field of mobility has a record of several international documents and treaties, which hold great relevance to their contracting parties and the global community. In particular, the *Geneva Convention on Road Traffic*, concluded in Geneva in 1949 and entered into force on 26 March 1952, is particularly relevant for promoting the development and safety of international

transportation. One of the fundamental ideas expressed in the Geneva Convention, for the scope of AVs regulation, is represented by the very description of the concept of driver, which needs to be always driving his vehicle and must be qualified to do so. Concluded in Vienna in 1968 and entered into force in May 1977, the *Vienna Convention on Road Traffic* of 1968 is another international treaty aimed at enhancing road mobility and safety through the establishment of shared traffic regulations among contracting parties. With the entry into force on March 23, 2016 of an amendment to Article 5, the definition of "driver" has been expanded by the Convention of Vienna and, thus, it has potentially permitted a significantly high level of automated driving.

The European Union, even presenting a comprehensive set of regulations governing traffic in nowadays technological context, however lacks specific provisions addressing both the definitions of "driver" and "driving". To date, the EU has not established a normative framework about autonomous vehicles, but substantial efforts have been made in this regard within the High Level Group GEAR 2030 initiative, where experts advocated for the importance of research and funding initiatives on both EU and national scale and called for additional support in terms of policies and regulatory measures concerning AVs. Then, after a series of discussions between the Commission, Council and Parliament, in July 2022 a legal framework for high-level autonomous vehicles eventually came into force: the *New Vehicle General Safety Regulation*. With this legislative act it is introduced a series of driver assistant systems aimed at enhancing road safety, thus paving the way for the launching of driverless cars in Europe. However, in the future more and more norms will have to take into account not only AVs peculiarities, but also aspects related to broader topics, first amongst all Artificial Intelligence.

In conclusion next-generation norms, in order to effectively regulate autonomous cars, will first of all need to address security in the communication between the vehicle and its digital infrastructures, then to establish accurate ways to address liability when automated decision-making processes are involved, and lastly to effectively keep up with Artificial Intelligence innovations. Following these paths will enable our society to finally shape tomorrow's mobility and transport, revolutionizing our experience of road travel to progressively gain a new kind of freedom.