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Autonomous Driving

Its impact on humans, automobiles and their relationship

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Autonomous automobiles are gaining in importance. In this essay, the development of autonomous vehicles and possible future situations will be described. I will focus on on how autonomous driving changes the way we value cars. My aim is to show the consequences of autonomous automobiles for humans. Thereby, the positive and negative effects of autonomous driving for humans will be shown.

Autonomous driving means the driving of a vehicle to a certain location without a human in the driving process. These cars usually work with visual input as a source. The data typically gets analysed and used by the driver. In case of full autonomous driving (level five), the input information needs to be evaluated and turned into a certain reaction by the car itself (Daimler, 2017). The National Highway Traffic Safety Administration (NHTSA) defines the degree of automation of vehicles. There are five levels of automatization. For level one there is no automatization meaning the driver has full control of the vehicle. Function-specific automatization is possible at level two, where the driver still has full responsibility for the vehicle guidance. Level three is the first level where the technology is able to assist the driver with the vehicle guidance. The motorist is still in charge of the vehicle. With stage four, the automobile undertakes control of the entire functions for safety under certain conditions like a certain traffic situation or certain weather. Entirely autonomous driving, which is level five of automatization, means that the driver only enters a certain destination and after that the car is in full responsibility for safety in every traffic situation (Litman, 2017).

In 1968, Robert Jungk predicts that “guided automobiles” will have a radical impact on transportation (Jungk, 1968). In 2004, the Defense Advanced Research Projects Agency (DARPA) held the first Grand Challenge, a challenge for autonomous cars, where the object is to get through a parkour autonomously. The aim was to improve the technology of autonomous vehicles for military purposes (Urmson, 2008). Assistance and safety systems are included in cars already. Autonomous driving seems to be the next logical step. The assistance systems are part of the comfort for the driver. In the future, the electronics of the car should be able to prevent accidents without the help of a human being (Schilder & Kittler, 2005). In 2011, Ostmann forecasts cars will still be the dominant means of transportation in 2030. The car itself will still be of high importance for its owner.

However, it is most likely that not everybody will have his or her own car and therefore car-sharing will be on the rise (Ostmann, 2011).

Autonomous vehicles impose new tasks on legislators. Overall, the “Vienna Convention on Road Traffic” (VCRT) from 1968 applies for Europe, which so far forbids autonomous driving. The VCRT was reworked in 2014. According to the reworked version of the convention, partial autonomous driving is allowed, and autonomous vehicles of stage five (fully autonomous cars) did not get an official approval for road service, mostly because the liability in case of an accident needs to be clarified (Johanning & Mildner, 2015).

Driverless cars will most likely affect many parts of our life: We might think of time and space differently. It might also affect the commute to work, which could resolve into affecting our place of residence. Additive, it could possibly end the days of parents driving their children to school. Autonomous driving opens up opportunities not only for children, but for elderly and disabled people to become mobile, as the “motorist” no longer needs to be able to drive the vehicle (Lipson & Kurman, 2016).

This will most definitely change a lot. The person in charge of the vehicle no longer needs to be able to understand the traffic regulations and hence no longer need a driver’s license. This means everyone, who is capable of entering a certain destination, is able to sit in the driver seat (unless there are some regulations specifying differently).The person sitting in the driver seat will no longer be the driver, if the car is able to drive on its own. Therefore, the function of the “driver” will most likely change. He/She only has to enter the final destination and the car will drive to that destination on its own. The “driver” is therefore able to concentrate on other things like the entertainment system. Thus, it is possible that the driver becomes the “man of the remote control” and the car might being an “entertainment system on wheels”. However, the experience of transport will surely still be relevant. However, the car ride gets used more and more for staying online. People can get information and stay entertained while getting to their destination rather than focusing on driving (Canzler & Knie, 2016b).

Advertising brochures from the car manufacturer Mercedes-Benz from September 2015 promoted autonomous driving: The human is said to be the most intelligent being on earth. However, the human is the most unpredictable part in an automobile. Therefore, Mercedes-Benz would like to introduce the human to the probably most intelligent means of transport - a car that is able to drive on its own. This car uses technology, which is said to make the mobility of the future safer and more foresighted than ever before. Camera, radar and laser sensors are combined in the security system, which analyzes the incoming data from the surrounding, communicates with other cars and has automatic parking (Canzler & Knie, 2016a). Like Mercedes-Benz advertised, the factor “human” does not need to be considered when it comes to autonomous driving as the cars are driving on their own. This could lead to fewer accidents as errors in the coding of the autonomous vehicles are very unlikely. Electronic assistance-systems already help the driver to drive more safely (Schilder & Kittler, 2005).

For some time, the criticism on the disadvantages of cars has risen. There is scorching criticism especially about the enormous space usage and the noise, greenhouse gas and exhaust pollution. This could potentially be minimized with autonomous driving (Canzler & Knie, 2016b). Driverless cars could use the capacity of the road system in a more efficient way as the vehicles all drive equispaced. This would also reduce the pollution of noise, greenhouse gas and exhaust (Johanning & Mildner, 2015). This could be possible due to the car to car communication. All of the cars would be connected to each other in order to communicate with each other and thereby dangerous situations could be prevented. These so called “connected cars” can be subordinated to a superior logic, which is a central requirement for a “smart city”. This makes an efficient use of the means of transportation and the traffic infrastructure possible. With the help of the sensors and detectors of autonomous cars the data could get analyzed, evaluated and send to other cars or a central network, which could coordinate the traffic. Besides, a car to car communication could save the users a lot of time as the car could drive around traffic jams and would not need to look for a free parking spot (Canzler & Knie, 2016b). Additionally, an improvement in the parking situation is possible because of the fact that cars could park in parking spots out of town and fewer parking decks in the city center would be needed. Therefore, savings in the traffic infrastructure should be possible, and traffic

lights and speed controls could be omitted (Johanning & Mildner, 2015). Jungk pointed out that a relief of the traffic could be possible if the car is no longer privately owned, but rather seen as an impersonal object of utility. Therefore, it is not unlikely to imagine a scenario in which the cars are used by more than one person similar to the concept of car-sharing. Having a car by oneself is most likely not going to be as important as having a vehicle wherever and whenever he or she wants (Jungk, 1968).

Certainly, autonomous driving might cause some issues. Certain jobs will most definitely change. Some jobs like taxi driving and driving trucks might even cease to exist. It is most likely that jobs like driving instructors and traffic policeman become less important. However, it is improbable that the jobs cease to exist; the jobs are most likely going to change. (Lipson & Kurman, 2016).

Two major factors of influence related to autonomous driving are safety and privacy: Sacrificing privacy for safety might be the biggest side effect in case the data for transportation is logged because in this case each and every move could get tracked and logged resulting into a loss of privacy (Lipson & Kurman, 2016). If a person commits his or her life to a machine, certain safety standards need to be complied with. These standards are incorporated right from the start. It is necessary for the industry to reach the standards. In addition, autonomous cars should be affordable for the mass market in order to be successful (Schilder & Kittler, 2005).

The development of driverless vehicles will most definitely be a major innovation in terms of mobility. These vehicles could emerge as a problem due to the fact that the vehicle users get older, which might lead to people driving until an older age, and therefore the used technology should not overstrain the vehicle users (Schilder & Kittler, 2005). The world population is aging. Industrial nations are most affected by that trend. In 1995 the average car buyer was 46 years old; the number increased and in 2010 it was an average age of 51 years and in 2020 an average car buyer of age 53 is expected (Die Zeit, 2011). Therefore, it is likely that in the beginning this innovation will be seen as an addition rather than a replacement to the existing means of transportation (Keichel & Schwedes, 2013). Mercedes-Benz thought about autonomous cars in a similar way. Their brochures from September

2015 says the following: Driving is not just about getting from location A to location B. Driving also is about the driving itself. Therefore, the german car manufacturer says that in the future they will still offer what they are known for - the delight for automobiles (Canzler & Knie, 2016a).

Originally, the physical condition was one of the major reasons for choosing a vehicle. Besides, the technical condition had a major impact on the choice as well. Related to cars, the brand also mattered in the decision making. Certainly, things seem to be changing in terms of the level of perception and the decision-making level. The added value will most likely change: The brands could become less important and the cars could be controlled by the digital marketplace. The original decision-making criteria like the brand or certain technical characteristics could become less relevant or even irrelevant (Canzler & Knie, 2016b).

In the future, it will be easy to operate cars, which might result into a higher usage rate and driver’s licenses being irrelevant as drivers turn into passengers. The car’s value could be defined by the variety of services, which the car has to offer. It is likely that many functions will be personalized. As a result, people might tend to feel familiar even when using concepts like car-sharing. The driving itself will probably get circumstantial; passengers will be able to concentrate on their phone or on communicating with each other as if they were travelling by train. This might cause some issues for traditional car manufacturers as they are used to the car being the center of attention. It is very likely that the car itself loses attention and modern gadgets become the main attraction. It is plausible for users to expect certain functions from the car like connecting with mobile devices. This might lead to the conceivable consequence of smartphone manufacturers having a crucial impact on the automobile industry (Johanning & Mildner, 2015).

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