**ÜBERBLICK**

**Selbstfahrende Autos:**

**Definition of a self-driving car.**

**A self-driving car or autonomous land vehicle refers to a car that can drive, steer, and park without human assistance. These autonomous vehicles are usually controlled by a computer or AI. In the case where no human assistance is needed at all to steer, they are also referred to as robot cars. Furthermore, the term autonomous vehicle only applies to a vehicle when it does not need to be controlled remotely by humans.**

**1. how does a self-driving car work**

**An autonomous vehicle navigates and gets by using the many sensors and radar on the car. These are the eyes of the vehicle. These sensors measure the distance between vehicles, detect potential hazards, as well as traffic signs.**

**The basic autonomous driving works only through the integrated computer or AI. These represent the brain of the vehicle, so to speak, and reacts as well as analyzes the information from the sensors and makes the necessary decisions. In this way, the vehicle adapts you completely to its driving environment.**

**In autonomous driving, there are 5 basic types that are used and some of them are already used today:**

**First: the driver is assisted by a computer that, for example, adjusts speed and direction to increase driving safety. Second: the computer controls both the steering and the speed of the vehicle, and the driver monitors what is happening and can intervene in an emergency. This method is used, for example, when parking independently. Third: The computer takes control of the cars in certain cases such as traffic jam. Fourth: The car can drive without a driver and pick him up, for example. Nevertheless, the car has steering wheel, accelerator as well as brake pedal so that the human can intervene in case of emergency. Fifth: The car drives without a driver and does not need human help. It drives itself in any situation.**

**2. development over the years**

**The first test attempts to self-driving cars already existed in the early 20th century. In 1925 there was the so-called "American Wonder". This automobile was steered by radio impulses. To do this, another car must follow behind and send radio impulses to the self-driving car. The era of autonomous cars began in the 1960s with the Stanford Cart. The analysis of camera images taken during movement took place on a stationary computer connected by radio. In the 1980s, Mercedes-Benz developed the robotic van. It was developed by Ernst Dickman and his team. Ernst Dickman is considered one of the pioneers of autonomous driving. In the 1990s, autonomous vehicles were first developed for the military. Until the late 2010s, autonomous vehicles were mainly developed and used for the military. Since 2016, major advances in autonomous driving have been made annually. One of the biggest visionaries for self-driving cars is Elon Musk with his Tesla cars, but many other car companies such as Honda, Volvo or even Mercedes-Benz have also achieved a lot in the field of autonomous driving.**

**3. legal basis and social debate**

**The UN International Convention on Road Traffic states that, according to Article 8, paragraph 1, "every vehicle and interconnected vehicles, when in motion, must have a driver." Therefore, autonomous vehicles are bound by the UN Convention in states that have signed it, and in those, self-driving cars are not yet allowed, but driver assistance systems have been allowed since 2014. However, in states like the U.S. and China, autonomous vehicles are permitted on the roads because they are not subject to the UN Convention.**

**Probably the two most advanced countries in autonomous driving are Germany and the US. However, there was until May 2021 of the problem with the UN Convention, but since May 2021, autonomous vehicles are allowed on the roads in Germany. According to forecasts, from 2030, then cars with City pilot, that is, the ability to drive alone both on the highway and in the city, will gradually appear on the roads. And it will not be until after 2040 that cars will be available in larger numbers that are fully autonomous from door to door, i.e., that no longer require a driver even on rural roads.**

**4.Ethical and moral problem**

**However, there is currently still one major problem in the world of autonomous driving, and that is: How does the machine act in an unavoidable situation e.g., a child and an old granny cross the road, the car cannot brake in time. Who does the car, or the computer, run over? Such ethical and moral decisions cannot be made by a computer itself, but must be programmed beforehand so that it can react to the situation. A human being, on the other hand, would decide at the moment the situation occurs, based on various factors that a machine does not have. Therefore, the following questions arise:**

**- Can a machine evaluate the situation correctly at all, for example, distinguish between a doll carriage and a real baby carriage?**

**- Would offsetting human lives represent an unreasonable instrumentalization of the "victims"?**

**- If an offsetting would make sense, how is this to be organized, i.e. which criteria play a role (e.g. the number of people or age)?**

**If these questions cannot be answered or implemented, to what extent will autonomous driving ultimately be permitted at all?**

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