***AUTONOMOUS VEHICLE***

Autonomous vehicle, also known as self-driving vehicles, is a vehicle that can sense its surroundings to move safely with little to no human interaction. The level of a vehicle autonomy can be described through the autonomous driving scale, which is made up of 6 different levels. The higher the level, the less human interaction upon the driving:

* **Level 0 (No Automation)**: The car has no autonomy, which means driver’s intervention is required at all time during the driving.
* **Level 1 (Driver Assistance)**: At this level, the Advance Driver Assistance Systems (ADAS) begin to seize the control of the vehicle in certain scenarios, but the appearance of a driver is still a requirement.
* **Level 2 (Partial Automation)**: With greater system awareness, the vehicle can do multiple complex action at once such as steering, accelerating and braking in some cases, but the driver still have to pay attention at all times during the drive.
* **Level 3 (Conditional Automation)**: The Automated Driving System (ADS) can do the majority of the driving operations in some certain situations; a driver is still a necessity in order to take back the control of the vehicle whenever the ADS requests
* **Level 4 (High Automation)**: The ADS is capable of handling all elements of driving in certain circumstances while the driver needn’t pay attention but still have the choice to step in.
* Level 5 (Full Automation): the vehicle can do all driving tasks regardless of the circumstances, a driver’s operation is not a requirement

Autonomous vehicles have been around a long time ago. In the 1939 World’s Fair, General Motors debuted the first ever self-driving car model. It was a vehicle that powered by electricity that took guidance from radio-controlled electromagnetic fields and magnetized metal spike buried in the road. From then, many famous car brand like Mercedes, BMW, Volkswagen… trying to make a modern self-driving car, but the most successful one is Tesla. Automated driving system is the most commonly seen in these smart cars. This system is a combination of a variety of other technology such as radar, cameras, ultrasound, and radio antennas to navigate its route and detect obstacle on its way, making the system more reliable and robust. For instance, Tesla’s driverless car technology, as known as “Autopilot”, uses 8 cameras that give a full 360-degree view up to 250 meters of range, while 12 ultrasonic sensors and a front-facing radar scan the surroundings for possible risks. The system gives you a view of the world that drivers alone can’t get, looking in every direction at the same time and on wavelengths that are well beyond human perception. You can even summon the car with Smart summons, which your car will navigate sophisticated environment and objects to come and to your location. Inside the car also provided with a big screen that display the scanned surroundings in a 3D view so the driver will know when to intervene. Although Tesla’s Autopilot system can assist your driving, enables your car to steer, accelerate and brake automatically within its lane, but still required the drivers’ attention. At the moment, most of modern vehicles are at level 1 of the autonomous driving scale, which have the ADAS to assist the drivers on the road for the best driving experience possible. Tesla is at level 2, which its ADS will take control of the vehicle in certain situation and make the driving tasks much easier to handle. There are still a lot of difficulties that scientists and car manufacturers have to overcome in order to make a fully automated vehicle. But with the continuous development of 5G and Artificial Intelligence, the possibility of an AI-controlled self-driving system put into practice in the next 10 years is very high.

With the constant development of self-driving cars, they will surely leave both positive and negative impact upon our lives. First of all, along with the development of autonomous vehicle, car manufacturers are also heading towards making electric-powered cars instead of traditional gasoline-powered cars. So, most of the self-driving cars in the near future will likely be powered by electricity, which will reduce the amount of carbon dioxide emissions and resolve the noise pollution problems in most big modern cities, resulted in cleaner air improve public health and living conditions for city dwellers. Second of all, autonomous vehicle will leave a major impact on the economy. With the appearance of self-driving cars, taxis drivers, deliveries drivers… are at risk of losing their job as the automated driving system will replace and fulfill their roles. However, the self-driving with easier and cheaper maintenance will help taxis and deliveries companies financially in prolong terms by cutting down on maintaining human resources. Furthermore, autonomous vehicle will surely improve people’s traveling experience. For example, with the self-driving cars, we will no longer have to drive the cars ourselves to work, instead we only need to sit in the vehicle for them to “deliver” us to work, while we can enjoy a cup of coffee and a relaxing morning on the car. The self-driving system will also reduce the amount of traffic jam due to the fact that these cars will communicate with each other inside their radius to predict and navigate the most optimal route to your desired destination. Thus, the self-driving system will surely reduce the amount of traffic accident since most of the accidents occur nowadays, the drivers are the one to be blamed. With the self-driving systems installed, driver’s errors can no longer be seen. And with the creation of autonomous vehicles, the government will have to make some changes toward the law regarding the usage of the vehicles’ self-driving system.

It is without doubt that the self-driving cars will make our life much easier: less traffic jams and accidents, improve the living conditions in big cities, make traveling less bothersome. But this technology is not something that I’m excited about for numerous reasons. Ever since I was a kid, I have been extremely fascinated with land vehicles, especially cars. In another way of saying, I am a car enthusiast. And as a car enthusiast, I find the concept of autonomous vehicle not very interesting. For instances, self-driving systems may hinder the “driving experience” that we can get from traditional cars. To me, driving is not just about getting to our destination, it is also about the excitement sitting behind the steering wheels. Sometimes, I just want to drive around, not going to any specific location, wandering anywhere you want, exploring new places by yourself. You can experience this kind of fun in a self-driving vehicle since it can only go to your inputted destinations. Moreover, cars that have self-driving system will definitely more expensive than those without the system, which means people with low financial income will not be able to afford such expensive items. Although I personally dislike the idea of autonomous vehicle, it will surely be a great thing for my family. My parents are not young anymore, soon they with age and their physical health will gone bad, and they might not be able to drive anymore. In this circumstance, the automated vehicle will surely come in handy for my parents to travel safely anywhere they want. Thus, the self-driving system can calculate the shortest and most optimal route to our destination so we can go anywhere we want in the shortest time possible.