A vehicle is defined as a thing used for transporting people or goods. Thus, an autonomous vehicle (AV) can operate itself without or with limited human intervention. These vehicles come in a variety of different types, like cars, trucks, ships and planes. Many of these technologies are not yet ready for consumers but are being tested by major companies and countries in multiple areas such as the automotive, agricultural, shipping and defence industries.

Examples of AVs in the transport sector include self-driving cars and trucks, like those be developed by companies such as Waymo, Volvo, Tesla and other major car manufacturers. The Society of Automotive Engineers defines five levels of autonomy (SAE 2018), the first level being absolutely zero features that assist the driver and the fifth being complete autonomy where a driver is not required or even an option. Current developers of self-driving cars, like Tesla with their Autopilot feature, have reached the third level, where the car can drive itself in some conditions, but the driver must drive in others (Tesla n.d.).

Self-driving cars are currently being tested on city roads and highways around the world (Coren 2018). Another place self-driving cars are being trained and tested is in virtual simulations. In these simulations AVs drive millions of virtual miles in situations of varying difficulty. As well as simulating a track Waymo’s simulator challenges their AI by simulating obstacles, other cars and even pedestrians. This allows Waymo’s self-driving cars to prepare for and hopefully react in a wide variety of scenarios (Silver 2018).

There are many concerns about the introduction of AVs in the transportation industry, chief among these is the impact on jobs. AVs have the potential to both take and create jobs. The jobs that can be taken are primarily in the transport sector, especially truck, taxi and delivery drivers. Jobs that can be created primarily involve the maintenance of AVs these include software developers, hardware technicians and mechanics (Pettigrew, Fritschi & Norman 2018).

Self-driving cars that are being tested have also been involved in sometimes fatal crashes (Levin 2018). In some cases this is the fault of the software or hardware providing and processing information of the cars, in others it is the result of inattentive safety drivers, who are to intervene in the event of the car not functioning properly, such as not detecting an obstacle or pedestrian (Reisinger 2018).

However, another problem, beyond the mechanical, is giving, or not giving, an AV a sense of ethics. One of these ethical problems that an AV and AV researchers need to tackle is the trolley problem. The trolley problem is an ethical dilemma in which a vehicle is moving at high speed with no option to avoid crashing into two or more different people. The vehicle at this point must make a choice, hit either of the persons or attempt and fail to avoid them and hit both.

It also brings in legal questions as well. The responsibility for a car crash into property or pedestrians can lie in multiple parties. Questioning whether the fault lies in the owner of the vehicle, the manufacturer, the person who wrote the algorithm or even the algorithm itself is something legal scholars will have to contend with as AV technology advances (Lin 2016).

In the mining sector Caterpillar and Komatsu are developing autonomous haulage trucks (Benton 2018) and in agriculture sector autonomous tractors have been tested in China (Gu & Patton 2019). These sectors in particular are more susceptible to automation because distances and areas of operation are often long and large and routes of travel repetitive allow more room for error, and less things to look out for than in busy city streets for instance (Peters 2019).

AVs used in a military context exist as prototypes, concepts and on the battlefield. Those currently in service include the Watchkeeper UAV (Unmanned aerial vehicle) in service with the British Army, which can patrol along points designated by the operator and gather intelligence information to transfer back to the operator and land by itself. Another is a prototype UGV (Unmanned ground vehicle) created by Horbira’s Mira company which can to carry out a range of missions such as logistics resupply and combat (Horbira -Mira n.d.). A concept that exists is that of swarm. These swarms consist of multiple AVs that are operating and communicating with each other to deliver kinetic impact or to fulfil other missions such as the construction of rope bridges for infantry to cross (Jane’s by HIS Markit 2019).

There are ethical considerations with regards to the use of these AVs in the military context, especially when the use of these AVs has lethal consequences. Questions like ‘Who or what is responsible for deaths and injuries?’ and ‘How much should we rely on autonomous systems?’ needs to be constantly debated as these systems see increasing adoption (Maurer 2018).

I think AV technology, as it progresses, will affect me positively but younger members of my family may suffer. I can see AVs granting me greater autonomy and to make travel safer as both a passenger and pedestrian, the condition of the driver, for example if they are inebriated or injured, would no longer be a factor in safety of the roads.

Younger members of my family may have opportunities for low or non-skilled work closed off to them. This will restrict them in terms of financial independence and the loss of other jobs due to the introduction of AVs may result in a saturation of skilled workers and not enough jobs for all of them.

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