Calling Shotgun: The Question of Self-Driving Cars

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Imagine in the future, you call an Uber to get to the airport. Your ride pulls up but, to your surprise, there is no one in the driver's seat. Instead, the driver is a computer algorithm, buried underneath the dashboard touchscreen. This idea is not something in the far-off future, but a current goal of the auto industry. With each passing year, more and more autonomous vehicles are being produced and hitting the roads. Cameras, sensors, and computers in cars have begun to take the place of human drivers. Some people believe that this shift to automated cars will revolutionize the world, bringing about a utopia free of highway traffic and car accidents. They dream of a day when everyone in a car can eat a meal or watch a movie together with no one worrying about driving or getting to their destination. This incredible new reality would make car trips a pleasure rather than a pain. However, we should not transition to a world of fully self-driving cars because they do not have the technology to match human standards and are currently incapable of independent operation. Additionally, autonomous vehicles contain a number of potential liabilities that make them volatile to operate. And finally, they put employment at risk and could destabilize the economy if not implemented properly.

Many people consider the concept of autonomous vehicles, also known as AVs, as a modern idea. In reality, scientists and visionaries have pondered and experimented with AVs for some time. In the book *Autonomous Vehicle Technology: A Guide for Policymakers* (Anderson et al, 2014), one of the earliest examples of exploration into autonomous vehicles is referenced. It states, "In 1958, for example, Disney aired a program titled 'Magic Highway USA' that imagined a future with, among other technologies, AVs guided by colored highway lanes…It was not until the mid-1980s that…these visions truly became available." The book expands further by discussing the AV experiments that took place from the 1980s all the way to the early

2000s. It highlights that most of the advancements in this technology were performed on a closed roadway system or in laboratories. It wasn't until 2003 that progress on autonomous vehicles finally began to exhibit substantial progress. The United States Defense Advanced Research Projects Agency, or DARPA, issued the Grand Challenge. The challenge was directed at scientists and innovators to race entirely self-driving vehicles through 150 miles of wilderness. This became the key starting point in the history of AVs and bridged the gap between laboratory tests and the open road. Within ten years of the DARPA challenges, dozens of car companies and technological organizations such as Tesla, Toyota, and Audi, began focusing on the implementation of partial to full autonomy in their vehicles (Anderson et al, 2014). Today, almost every major car manufacturer seems to have developed at least partially independent driving systems. Advanced technology and consumer buying trends continue to propel the car industry forward into making fully self-driving vehicles the primary form of transportation. With the rapid advancements in AVs, it is essential that the scientific community pause to consider whether this is a worthwhile endeavor.

One of the most contentious issues related to self-driving cars is whether or not they are truly a safe form of transportation. Advocates for AV technology argue that autonomous vehicles will make roads safer. They contend that, unlike human drivers, AVs are incapable of being distracted while on the road and will thus cause fewer car accidents. "They're not wondering what's happening on this project, what to make the kids for dinner, or even why that person ahead keeps swerving out of their lane. In essence, AVs reduce the variability on the road," states Neil Sahota (2020) in an article for *Forbes*. This increase in consistency can have the potential to make roads safer. However, this technology can have its own flaws that can compromise safety as well. The most common of these are simple errors in the program code

that drives the car. Even if the program that drives the car might be near perfect, the human who wrote it is not. A single misplaced one or zero could spell the difference between life and death for a passenger in one of these vehicles. Another example of these technical flaws is due to AV technology lacking human moral and ethical reasoning which can affect decision-making while driving. Jonathan Webber (2019) delves into this dilemma in his article "Driverless cars: once they're on the road, human drivers should be banned" for *The Conversation*: "Should a car save its passengers at the cost of killing or injuring other people? Should it swerve to avoid someone in the road if this means hitting someone on the pavement?" The article goes on to talk about how humans tend to give inconsistent answers when asked this question and become even more unpredictable in their answers if even minute details of the scenario are changed. If humans cannot give a consistent answer to these types of questions, how can an algorithm designed by humans be consistent about it? Although self-driving cars may reduce the number of vehicular accidents due to human error, it also completely entrusts human lives to artificial intelligence which lacks proper judgment and reasoning.

7Another issue with AV technology is that most of the "autopilot" software used in commercially available cars is not as advanced or independent of human intervention as it may seem. *CBS News* (2022) recently interviewed automotive titan Honda about the capabilities of their autonomous driving system: "…the system is not intended or capable of detecting the end of a road and is not marketed or considered a hands-free technology. adding that it's the driver's responsibility to maintain control at all times." Honda, like most AV car companies, uses this type of partial autonomy in their vehicles. These types of systems allow cars to do things like staying in their lane, changing lanes, pulling over, and in some more advanced vehicles, basic of self-navigation by GPS. However, this technology creates a false sense of security that the cars

are capable of driving themselves, while in most scenarios they still require occasional input from their driver. It creates a major problem, as many drivers begin to rely heavily on the AV's abilities and neglect to intervene when necessary. "Is the person driving or is the person not driving? Because if they're driving then this stuff seems pointless and if they're not driving you can't ask them to drive at a moment's notice," states Silva-Braga, a *CBS News* (2022) reporter in the article "What's the status of self-driving cars?" The abilities that partially autonomous vehicles possess can cover some, but not all, of the actions required to drive. Additionally, if the scenario the car is in becomes too difficult for the car to understand, it will shut the autonomy systems off at a moment's notice and revert back to the human driver, who may have become distracted as they deemed the car to be in control of itself just fine. With neither the car nor the driver in fully in control and aware of their surroundings, a car accident is quite likely. The technology needed for cars to be able to drive completely independent of human interaction is far from viable to date. Without this autonomy, present AVs seem to create more hazards than advantages for their owners and others on the road.

In addition to the independence flaws of self-driving vehicles, they also are prone to security breaches and hacker interference. The possibility of self-driving cars being hacked is something Alexis Madrigal (2018) of *The Atlantic* discusses in his article "7 Arguments Against the Autonomous Vehicle Utopia." Madrigal (2018) stresses that, "Every other computer thing occasionally gets hacked, so it's a near-certainty that self-driving cars will be hacked, too." This reality is particularly dangerous because, unlike a laptop computer is a robber of personal information, an autonomous car hacking can rob someone of their life. The article "The Dangers of Driverless Cars" by Clifford Law Offices (2021) for *The National Law Review* highlights other potential flaws of these vehicles including faulty software, inability to adapt to weather

conditions, and many other issues. Clifford Law (2021) stresses that many car manufacturers have been pressuring the government to loosen restrictions on AVs in order to put more of them on the road. They noted that, "A January 15, 2021 article in GovTech noted that rules that allow fully self-driving vehicle manufacturers to "skip certain federal crash safety requirements" in vehicles that are not designed to carry people were issued by the Trump Administration…" These types of decisions to compromise safety in order to accelerate production is an incredible risk to those who purchase and drive these cars. Driving unsafe vehicles around is an unnecessary hazard to those in and outside the car. Many critics of self-driving cars stress that it would be far better if automakers spent less effort producing and put more time and energy into improving their quality and safety. With millions of dollars invested in AV technology, car manufacturers are more interested in profit than public concerns about safety.

Another economic concern related to the rise of AVs is the impact that this transition could have on the employment market. Some people argue that this change in the automobile industry is filled with potential, particularly in the creation of new jobs. "The driver job role could transform into an AV specialist…New roles like AV technicians, remote AV controllers, and AV service managers would emerge, creating new qualifications," states Vinod Kumar (2022) in his article "Autonomous Vehicles And Their Impact On The Economy" written for *Forbes*. He suggests that entirely new employment opportunities could evolve such as "onboard retailing and dining." However, not everyone shares Kumar's (2022) sense of optimism. Critics counter that for however many jobs autonomous vehicles might create, they would also eliminate many more that form the backbone of our transportation-driven economy. Neil Briscoe (2019) of *The Irish Times* highlights one of the endangered fields of employment in his article "Why we should ban autonomous cars now":

> In the immediate line of fire, there are the many millions of taxi drivers around the world. Old-school professional cabbies are rapidly being replaced by the likes of Uber and Lyft, which you might think is fine. The trouble is that the likes of Uber and Lyft have plans to replace their human drivers with robots in the near future, so unemployment beckons for many.

Taxi and Uber drivers are just some of the many jobs that are in danger of being eliminated if self-driving vehicles become the standard form of transportation. Truckers, bus drivers, chauffeurs, and numerous other careers would cease to exist, forcing millions of people into unemployment in an already unstable economy without any promise of making up for these losses. Although AVs have the potential to create new job opportunities, there is little evidence to show that they will be able to compensate anytime soon for all the jobs that might be eliminated.

The rapid production of autonomous vehicles that is occurring in today's car industry has been fueled by recent advancements in technology. However, the technology required to make AVs viable is still far from meeting acceptable standards. Additionally, self-driving vehicles currently still depend on human interaction as they lack the ability to operate on their own, which defeats the purpose of this technology. Self-driving vehicles also pose a danger to their passengers due to a number of weak points within their systems such as poor decision-making abilities and susceptibility to hackers. Finally, the introduction of autonomous vehicles may eliminate thousands of jobs in the transportation industry. I firmly believe that, although they would benefit society, the technology and safety standards are not ready for them. Some AV technology has been proven successful such as driving assistance for things like changing lanes and parallel parking only. Using exclusively these in cars will yield safer and less damaging

results. Nevertheless, the car industry will continue to produce autonomous vehicles ready or not. So, the next time you call a taxi, keep your eyes open. You never know who or what will be driving you to your destination.

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