

A Survey on Autonomous Vehicles-Benefits and Drawbacks

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Abstract

Making roads safer is a subject that has received a lot of attention recently in the media, public policy circles, and in general health and wellness talks. A startling proportion of the incidents are avoidable, and many of them are caused by distracted driving. A stronger effort has been made in the field of technology in recent years to make automobiles safer, drivers more attentive, and accidents less likely as a consequence of the amount of traffic accidents that plague the nation and the tragic injuries and fatalities that come from them. Self-driving vehicles are a development that seems to fit in a sci-fi movie, along with other technology that has evolved during this period. Self-driving cars are not that far off, but the argument over whether they will boost or diminish safety continues to rage. In the not-too-distant future, self-driving cars stand a great chance of taking over as the primary mode of transportation. The use of self-driving automobiles has a lot of benefits, but there are some disadvantages as well. This essay explains the benefits and drawbacks of self-driving automobiles.

Keywords: Self-driving cars, vehicle technology, computer vision, vehicle sensors, autonomous driving

1. Introduction

Everyone is curious about the safety of self-driving automobiles as automotive technology develops. It's exciting to consider a future, in which all cars are electric and entirely self-driving, but it's not implausible and it may happen [1] & [6]. Autonomous vehicle technology is developing swiftly, & for many individuals, what was previously an idealistic feature of a sci-fi futuristic film is fast becoming a reality. Even while certain

limited levels of semiautonomous technology are starting to appear in many cars, completely driverless technology is still in the testing stages and is subject to strict regulation and oversight. Although it may be unintentionally implied by brand names like "auto-pilot" used in vehicle marketing, self-driving cars are not yet ready for usage on public roads. It may be seriouslydeceptive [2].

2. Benefits of Autonomous Cars

Self-driving vehicles have the potential to be amazing in theory for many people who suffer with impairments or who simply wish the newest in available vehicle technology, provided that significant study into their advantages is conducted. The following are a few benefits of autonomous cars.

- The machines won't tire
- Robots are less prone to errors
- Robots have the ability to maintain attention
- No danger of drunk driving
- Autonomous vehicles adhere to traffic laws
- Robots have higher attention spans
- Greater mobility for those who cannot drive
- More comfortable driving conditions
- Low insurance costs
- Enables working while driving
- Fuel savings
- Decrease in car thefts
- Economic advantages

2.1 The Machines Won't Tire

Self-driving automobiles have the significant benefit that, unlike humans, robots do not experience fatigue. Drivers who doze off behind the wheel of their vehicles cause several accidentsevery year.

Thus, since autonomous vehicles will maneuver through traffic & drastically minimize the prevalence of accidents, drivers can fall asleep behind the wheel without any negative consequences.

2.2 Robots are Less Prone to Errors

Robots often make fewer errors than humans do. Humans cannot usually completely concentrate on driving since there are so many diverse thoughts constantly racing through their heads. This frequently results in errors and mishaps. These collisions might be avoided by using self-driving cars since they won't be distracted and will make fewer, or even no, mistakes.

2.3 Robots Have the Ability to Maintain Attention

Humans are easily sidetracked by a wide variety of daily distractions. People might occasionally even use their phones while driving. The chance of major accidents rises as a result of all such diversions. Robots, in contrast to people, are not susceptible to those types of interruptions. Due to the fact that robots can maintain a continual attention on what is occurring on the streets, the likelihood of accidents is much reduced and they just carry out what they are designed to do.

2.4 No Danger Of Drunk Driving

People who are driving intoxicated or under the influence of narcotics are to blame for a large number of accidents on roadways. Many people either completely disregard or just underestimate the dangers of driving while under the influence of drugs or alcohol. The use of self-driving cars, which will perform all tasks and navigate through traffic, might lessen this issue.

2.5 Autonomous Vehicles Adhere to Traffic Laws

Autonomous vehicles will abide by traffic laws. To ensure traffic safety, they would strictly abide by the speed limits and take all essential safety measures. Humans, on the other hand, routinely exceed posted speed limits and sporadically disregard traffic signals, which might raise the risk of accidents [3].

2.6 Robots have Higher Attention Spans

When compared to humans, robots have far longer attention spans. Studies have shown that humans have a shorter attention span than goldfish due to the massive information deluge obtained in every aspect of everyday life. Driving while having trouble paying attention increases the possibility of collisions, which may be very fatal. Since self-driving

cars have a virtually limitless attention span and are unlikely to be distracted, they are the ideal solution to this problem.

2.7 Greater Mobility for those Who Cannot Drive

Self-driving automobiles might be a terrific option, particularly for those who are physically unable to operate a vehicle. Consider a retiree who will soon be unable to operate a vehicle safely owing to health concerns or other factors; using an autonomous vehicle would be a great method for this guy to maintain his independence because it could take him to the nearby place anytime he desires. As a result, self-driving cars improve the mobility of individuals whomight otherwise find it difficult to go out.

2.8 More Comfortable Driving Conditions

Driving in self-driving cars can be surprisingly convenient. In major cities, travelling to work can be particularly exhausting due to traffic congestion. The stress of navigating city traffic may quickly turn into great annoyance. Instead, one who is utilizing a self-driving car could just relax by reading a book or engaging in other activity he enjoys and let the car manage the traffic [4].

2.9 Low Insurance Costs

Insurance companies could give a discount for purchasing a self-driving vehicle because there may be fewer accidents as a result, which might decrease the insurance price. Therefore, even though self-driving cars may cost more than traditional automobiles, one might end up saving a lot of money over time on auto insurance [7].

2.10 Enables Working While Driving

People could even commute while working once the technology underlying driverless vehicles reaches maturity. Consider that the user has a demanding work and a presentation that needs to be finished shortly; while the automobile successfully navigates through the traffic, he might use the opportunity to focus on the presentation using his laptop [5].

2.11 Fuel Savings

The adoption of autonomous vehicles may potentially result in the reduction in fuel usage as they are far more adept at predicting changes in traffic conditions and might travel

more smoothly. This might help in saving a lot of currency over time, money that could be spent on other useful stuffs to make the house and everyday life greener.

2.12 Decreased Car Thefts

Since self-driving cars have highly sophisticated technology, criminals may choose not to steal these vehicles out of concern that they would be apprehended quickly. These vehicles could also have extra security systems, making them very hard to steal in any case. Thus, purchasing an autonomous vehicle would also reduce the likelihood of auto thefts.

2.13 Economic Advantages

The usage of autonomous vehicles has certain financial benefits as well. Government spending on the police and ambulance might be greatly reduced if the frequency of automobile accidents were to be significantly decreased. As a result, the taxpayers would save a lot of money.

3. Drawbacks of Autonomous Cars

Self-driving cars offer a number of important advantages, but they also have certain disadvantages such as,

- Higher unemployment rate due to the reduction in demand for cab drivers
- People could lose their manual driving skills
- Higher congestion levels
- High R and D costs
- Expensive starting cost
- Upkeep might be difficult and expensive
- Privacy concerns
- Technical errors
- Insurance issues
- Hacking issues

3.1 Higher Unemployment Rate Due to the Reduction in Demand for Cab Drivers

The use of autonomous cars, for instance, would lead to increasing joblessness in the transportation sector as many taxi drivers would no longer be needed. Therefore, for this set of people, self-driving automobiles may be seen as more detrimental than beneficial.

3.2 People Could Lose their Manual Driving Skills

Another problem is that many individuals won't be able to operate manual vehicles anymore. This is not a major problem as long as the autonomous car is operating well. The ability to drive the automobile safely manually may be necessary if the self-driving system has any problems. Because of this, even if self-driving vehicles become the standard in the industry, it should be ensured that people have a fundamental grasp of manual driving so that they can address issues if the autonomous system malfunctions.

3.3 Higher Congestion Levels

Self-driving cars are so simple to operate that when they are introduced, the number of vehicles on the road may increase, which might increase traffic. As an illustration, someone without a license may just buy an autonomous car. Self-driving cars might potentially have a detrimental impact on the atmosphere if the number of vehicles on roads grow, since moreconservatory gases would be released into the atmosphere.

3.4 High R & D Costs

Although autonomous vehicle technology is very promising, a lot of money has to be invested before it can be used for mass transportation. Numerous research projects and hundreds of billions of dollars must be invested until this sort of technology is sufficiently developed. Another ten years might be needed before the world can transition to driverless vehicles on a widespread basis.

3.5 Expensive Starting Cost

Autonomous automobiles will be expensive, especially at first. A self-driving automobile might cost hundreds of thousands of dollars, according to industry experts. It is true for the majority of technology, nevertheless. The cost might dramatically decrease as time passes and technology advances. Self-driving vehicles would therefore initially be out of reach for the majority of people, but eventually they would probably be within reach for the majority of middle-class families.

3.6 Upkeep Might Be Difficult and Expensive

The expertise of the majority of mechanics is still in its infancy, just as the technology underlying autonomous vehicles. Because many auto repair shops may be unable to properly handle issues with self-driving cars, owners of these vehicles may have difficulty finding a

technician who has the expertise to service their vehicles. As a result, maintaining autonomous vehicles may be expensive and challenging [10].

3.7 Privacy Concerns

Critics of autonomous vehicles frequently raise severe privacy concerns about this technology since it requires a lot of data to function. The general people, for instance, would not be able to check where their data is held or what other uses it may be used for. Therefore, in order to maintain the public's trust, autonomous vehicle firms must ensure that personal data is adequately handled and not exploited.

3.8 Technical Errors

Even though robots seldom make many mistakes, self-driving cars have occasionally been involved in collisions. This is also due to the fact that the technology behind self-driving cars is still in its infancy. Over time, there will be fewer accidents involving autonomous cars. Therefore, even if they are still possible, technical errors are still far less frequent than human errors [8].

3.9 Insurance Issues

There may also be some problems with the insurance for autonomous vehicles. There may be several disputes on who was at fault in an accident. As a result, courts will probably be quite busy once driverless cars are widely accepted.

3.10 Hacking Issues

A further risk posed by self-driving cars is hacking-related problems. The technologies that self-driving cars depend on to function might be attacked by hackers, which could result in a number of deadly accidents. To prevent hacker attempts and ensure the security of autonomous vehicles, automobile manufacturers must ensure that the underlying data systems are adequately safeguarded [9].

4. Conclusion

The idea of an autonomous car is a successful phenomenon that has aided in several driving situations, including those requiring an enhanced driving support system, automated braking, etc. This essay discusses the benefits and drawbacks of autonomous automobiles. As the technology employed by autonomous cars advances daily, new research and implications

are generated. As a result, several people have the chance to create quick and trustworthy technologies that will be applied to the upcoming autonomous cars. The present technologies can be improved and the autonomous vehicles can be made more dependable and compatible.

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