Serra Abak

Daniel Powell

Technical Writing and Communication

March 16, 2015

Autonomous Vehicles

Introduction

Autonomous cars have recently been making headlines with the launch of Google's first self-driving car. Last year, "Google's [self-driving car] racked up more than 700,000 autonomous miles" (Davies) safely in California and car companies, such as Audi and Volvo, are scrambling to put their first autonomous cars on the road. The cars have been legalized in four states and the District of Columbia and are being considered in eleven more.

With a promise to eliminate human error completely, they have excited the public with the possibility of also eliminating death by car crashes, high transportation costs, and traffic. However, the excitement also has been giving way to doubts. The self-driving cars have come under great scrutiny as legal, technological, and social problems begin to crop up on the way to commercialization.

Discussion

Within the past few years, there has been great advancement in the technology of autonomous cars. Researchers at Carnegie Mellon University have successfully nearly eliminated all complicated buttons, cameras and sensors that were once the poster child of self-driving cars. The technology in these cars are quickly making their way into current cars as capabilities that

assist drivers, such as adaptive cruise control and emergency braking. There is no doubt that autonomous cars could be a significant positive impact on our society. The Association for Safe International Road Travel estimates that "nearly 1.3 million people die in road crashes each year, on average 3,287 deaths a day. An additional 20-50 million are injured or disabled" ("Road Crash Statistics"), which could be greatly reduced, if not eliminated with a widespread adoption of autonomous cars.

Legal Concerns

However, "despite the fact that even a bad autonomous (or semi-autonomous) car would still save lives overall, there's no legal infrastructure in place to make it possible for manufacturers to implement such technology without undue risk of being sued into oblivion the first time something goes wrong" (Ackerman). While the technological advancement for self-driving cars has been making great strides, the government has not been playing an active role in discussing the future of transportation and autonomous vehicles.

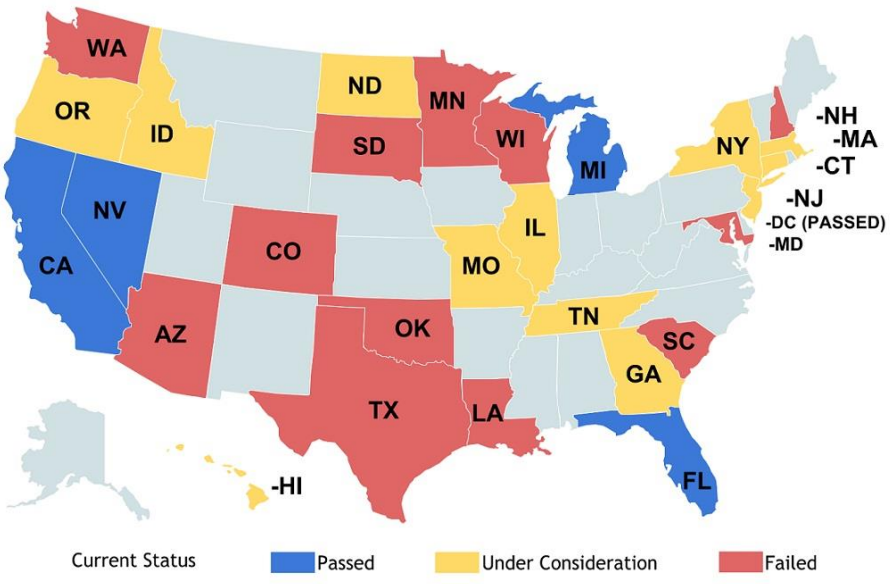

Figure 1-1

Currently, four states and D.C. have passed specific laws in regards to self-driving cars in public: Florida, California, Nevada, and Michigan. In comparison, twelve states have rejected legislation in regards to self-driving cars (Figure 1-1). It is evident that self-driving cars are having a hard time getting through the legal system. There are many concerns about the manufacturer's liability and privacy. For the car to operate, "approximately 1 GB of data will need to be processed each second in the car's real-time operating system" ("Technology and Computing" 2015) and stored in databases of private companies. In addition, as cars become connected to the Internet, the issue of security and hacking become a very significant problem in both law and society.

Social Concerns

The Insurance Information Institute summarizes, "A survey by IEEE, a technical professional organization dedicated to advancing technology for humanity, of more than 200 experts in the field of autonomous vehicles found that of six possible roadblocks to the mass adoption of driverless, these three were ranked as the biggest obstacles: legal liability, policymakers and consumer acceptance" (2015). Along with the excitement of not having to drive comes the fear of not being in control. The average driver is not yet comfortable with the idea of being at the will of a machine that feels like you don't have control over. Although there are a few autonomous vehicles that are safely used in public, like shuttles, the idea of a transportation machine being solely operated by the machine itself is still a new idea. "Human drivers may be forgiven for making an instinctive but nonetheless bad split-second decision, such as swerving into incoming traffic rather than the other way into a field. But programmers and designers of

automated cars don't have that luxury" (Lin), Patrick Lin explains in his article "The Ethics of Autonomous Cars."

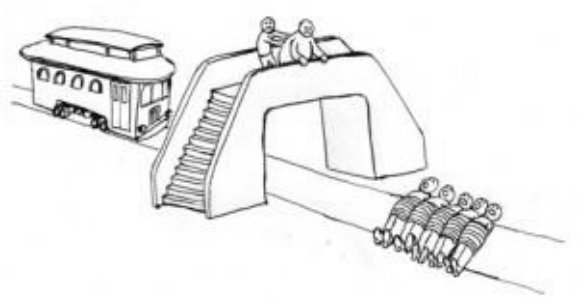

Figure 1-2

In Figure 1-2, the classic trolley problem, we see a trolley heading towards five people (that possibly are on the tracks by their own fault) who will be run over by the train. The only way to stop the train is to push the innocent fat man onto the tracks to stop the trolley. Which would you choose to do—save the five people (that may or may not be at fault) or kill the five people and spare the innocent fat man? While most humans have a built-in moral compass that can think beyond just numbers, a car similarly would not be able to decide ethically whether it should swerve and kill one person or crash and kill four, as the difference between killing and letting die come into play (Lin).

Conclusion

While the technology for self-driving cars have advanced greatly, public and legal support has been stagnant. Testing cars in public is slowly being approved in certain states as public support rises, but researchers believe that the cars are ready for the road and could be implemented. However, the roadblocks in the way of autonomous cars get exponentially more difficult to solve as legal and social problems come to light. Insurance, ethics, liability, acceptance, privacy,

security, and many more constructs of society come into play in such a colossal technological revolution. While the road revolution may be near, it is not as near as the public may be expecting with many social and legal obstacles to overcome still.

Recommendations

To speed up the process of getting self-driving cars out on the road, there must be constant support from the government and Congress. Media has helped self-driving cars receive a lot of support, which has swayed some of the negative opinions to a more positive outlook. Making sure that this topic stays on the news and active on social media sites at all times is very important for the technology to gain further traction. This way, the general public will become more comfortable with the idea of autonomous cars, and the social obstacles will dissipate through exposure. With social acceptance and buzz, Congress is bound to accept self-driving cars for testing on the roads.

Works Cited

Ackerman, Evan. "Uber Turns from Google, Teams Up with Carnegie Mellon on Self-Driving Cars." IEEE Spectrum. IEEE, 3 Feb. 2015. Web. 16 Mar. 2015.

Davies, Alex. "An Autonomous Car Is Going Cross-Country for the First Time | WIRED." Wired.com. Conde Nast Digital, 13 Mar. 2015. Web. 14 Mar. 2015.

Lin, Patrick. "The Ethics of Autonomous Cars." The Atlantic. Atlantic Media Company, 08 Oct. 2013. Web. 13 Mar. 2015.

"Road Crash Statistics." Road Crash Statistics. Association for Safe International Road Travel, n.d. Web. 13 Mar. 2015.

"Self-Driving Cars and Insurance." III. Insurance Information Institute, Inc., Feb. 2015. Web. 16 Mar. 2015.

"Technology and Computing Requirements for Self-Driving Cars." Intel. N.p., n.d. Web. 16 Mar. 2015.