# **AI in Autonomous Vehicles**

Maxim Bilenkin

Department of Science and Technology, Bellevue University – Bellevue

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Professor Fadi Alsaleem

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# **AI in Autonomous Vehicles**

With the rapid advance of Artificial Intelligence electric vehicle company like Tesla took the big challenge to develop a self-driving car. This is a brave and risky move but worth the endeavor that has amazing potential. Currently, there are many challenges and obstacles that prevent fully implement self-driving cars on the roads. Just to name few, the autonomous vehicles cannot navigate appropriately in an extreme weather condition. Heavy snow and rain making hard or even impossible for the sensor cameras to see clearly what is ahead to steer a car. The road lines and dividers covered under white snow are not visible either to the camera making impossible for artificial intelligence to process road surface correctly to navigate a car in correct direction. Thus, causing dangerous driving and risking human lives. Another issue, not all roads are clearly marked with clear signs that would assist autonomous car to navigate. On July 2, 2024, The Arizona Republic newspaper reported an incident where driverless vehicles got pulled over in Phenix, Arizona by traffic officer for going out of lane and creating very dangerous condition on the highway. Although, the car stopped at the request of the police officer because it was trained to recognize serena. The officer could only communicate to the dispatcher that gave the explanation that the car failed to drive appropriately due to the inconsistent construction signages that it had encountered (see reference for source).

On April 13th, 2022, another incident happened in San Francisco where police officer stopped a self-driving car but the vehicle did not follow wait direction from the officer. While confused officer went back to relate to his partner who was waiting in the police car that there is no driver. The car apparently took off and drew on a different lane and then got pulled over again. Clearly, at this point it’s a big challenge the driverless cars are facing with the limitation of following direction from police officers if something happens on the road (see reference for

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source). Another, obstacle is the ability to recognize and be able to distinguish different images on the road. Plastic bags and rocks confuse the AI to correctly identify and distinguish them. The camera sensor records the image of a bag and AI might think that it is a big rock and automatically hit the breaks in the middle of the road on high-speed highway causing a major accident. According to The Guardian newspaper, The National Highway Traffic Safety Administration (NHTSA) concluded that there were at least 13 fatal accidents involved Tesla’s autopilot (see reference for source).

It is unfortunate that many technological revolutions are not without loss of human lives. Many human casualties were taking during space and aviation technological revolutions. Nevertheless, today we are all enjoying the benefits of all it brings to us. One can cross the ocean in few hours instead of sailing few weeks or months. Travel into space and install satellite system that we can use in telecommunications. As of today, the AI is still in its early stage of development. Not enough data collected is a big challenge and obstacle. It prevents AI to make correct decision in all situations that can happen on the road.

Despite all the obstacles, over time AI will become more sophisticated with enhanced ability to clearly distinguish objects, follow directions and be able to cooperate with humans including with police officers. With the increase availability of data centers across the country, AI will faster and better process information. In a simple explanation, there are billions or probably trillions of different images in total that need to be generated of different objects with different angles and sides so that the camera can recognize all those objects in all situations that can occur. When you hear on television someone is saying “Tesla has accumulated more driving data than any other electric car company.” What it means is simply Tesla cars were driving and

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scanning all the surrounding objects and stored all that driving data into its data base. So next time when the car drives again the same route and sees the same objects, the system sends all those images to its data base where it had previously stored them. The AI then quickly processing received information by matching it with the stored data and make decision by responding back to the autopilot on what direction or action to take. The whole process takes milliseconds.

As of today, there is a shortage of data centers and driving data. Not enough data has been collected on various objects and different scenarios that can take place. For example, imagine a little kid instead of walking jumping while crossing a street. AI would not know this kind of scenario because jumping and walking are two different things. As time proceeds and more scenarios accumulated AI becomes smarter and more sophisticated. It will be able to precisely make decisions and navigate a vehicle into the right direction. Currently, there are many data centers building all over the country. You can visually see the current map of all the locations across the United States that was provided by Data Center Map (see reference page for source).

The benefit of AI unlimited to our society. Just to name a few. Imagine a robotaxi car that can operate without a driver which means the operating cost and fare would probably decline substantially because there is no need to pay salary to the driver. Also, the car can drive 24/7 without getting tired or lose attention on the road. One group that would benefit a lot are the senior citizens who cannot have a car for various reasons such as unable financially to afford one. People with limited abilities such as blind individuals would benefit greatly as well. Instead of taking public transportation with all the hustles. A person can simply order a car from its

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smart phone app and get a ride to a medical office to see its doctor. So much improvement to once life. Another good example, parents can send their kids to school. Just order a car and it will drive your kids to the gates of a school. One might not need to own a car anymore with advance of AI technology. Paying all those insurance costs, gasoline, and maintenance not worth the benefit. For many, always having a headache where to park a vehicle is another issue. Isn’t better to order one when you need it, use it, and let it go. It so efficient. It eliminates so many issues that one otherwise would have to worry about it. Self-driving cars would help to decrease traffic on the roads and make environment cleaner.

However, with all the benefits that AI will bring there will be the other side. Many uber, taxi, truck, and bus drivers will be out of jobs and displaced. People will have to accept the new reality and retrain themselves to a new occupation. It is unpleasant and disruptive process for most. The unemployment rate will substantially increase. Many will suffer economically.

Conclusion

To conclude, there are more benefits in the long run. Currently, AI in its early stages of development and facing many challenges like regulatory approvals in addition to the once that were described. The current obstacles and challenges should not stop the technological development. In a long run our lives will be benefitted with unlimited potentials. At this time its hard to predict or fully imagine all aspects AI can have on our life. We can see today how the aviation revolution that began in 1903 and the internet revolution in the 1990s have changed our lives in so many aspects. Today, we can buy something online and the parcel delivered to our doors. Click a button on the phone and a taxi arrives. AI will bring more amazing things in future. At this stage, AI is like a little child that is growing every day and getting smarter as it accumulates more data.

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**Data Center Maps**

<https://www.datacentermap.com/usa/>

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