Name(s)	Project Number
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Project Title

Effect of Self-Driving Cars on Traffic Congestion

Abstract

Objectives/Goals

My objective is to prove that self-driving cars can reduce traffic congestion through the use of a simulator. My goal is to create a Java based traffic simulator that models self-driving cars in comparison with human driven cars.

Methods/Materials

For my base program, I used the MovSim Traffic Simulator. The MovSim Simulator is an open-sourced, lane based, traffic simulator written in Javascript. The program simulates simple traffic circumstances, such as lane change, yielding, and overtaking on a ring road. To change the simulator, I switched the ring road into a straight freeway with metrics for number of cars and the speed in which they travel.

Results

In my simulation, the speed of the cars increased steadily as the percentage of self driving cars increased. The main cause of traffic congestion is human behavior (i.e. rubbernecking, unnecessary lane change, driving under the speed limit) and introducing self-driving cars will remove this factor.

Conclusions/Discussion

To conclude, the use of self-driving cars does, in fact, increase the speed of traffic consistently and reduce traffic congestion by removing human behavior out of the equation. Theoretically, if the amount of self-driving cars on the road reached 100%, the possibility of speeds you could reach safely are endless. Promoting awareness through this simulation's data could also help people understand that self-driving cars are much more than a publicity stunt, but an ease upon traffic congestion and a huge increase in automobile safety.

Summary Statement

Proving that self-driving cars drastically reduce traffic congestion through the use of a simulator.

Help Received

N/A