It appears to be... jammed!

Project specification in DD1354

Richard Uggelberg
rug@kth.se

Albin Remnestål
albinre@kth.se

Mikael Blomstrand
mbloms@kth.se

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1 Background

Today the discussion on autonomous vehicles is more important than ever before. However, what are the actual benefits of autonomous drivers when it comes to traffic congestion. It is said that human error is largely to blame for the traffic jams of today. Mostly due to our slow reaction times to changes in traffic flow. What difference would it make if all drivers were robots?

2 Problem

This project test the claim that a traffic network of autonomous cars would reduce the number of traffic jams. The initial hypothesis is that the model for autonomous cars will be slightly more effective in this aspect; however, the difference is not expected to be significant.

3 Implementation

We will make a model of a city with a grid of streets and avenues and a model for the cars (how to steer and accelerate, etc.). Additionally, there will be one model for human drivers and one model for autonomous cars. These are the two models that will be compared. In both implementations, the human drivers and autonomous cars will travel in identical cities with identical cars. Furthermore, the destination of each car will remain the same in both simulations. The simulation should itself be able to show some differences in how the models perform, but the aim is to also to measure other parameters like the time it takes for all cars to reach their destination or the total number of full stops made.

At intersections we will either have to have traffic lights or just some simple set of rules for who should give way for the other. Another alternative to this is to use a simpler and more caotic approach where cars simply have to give way if there is already other cars in the intersection.

Decisions will be made by cars invidually in a deterministic manner. The goal is that with the same inital seed and parameters, the results of the simulation should allways be the same.

For graphics we will most likely use Unity.

4 Evaluation

Asserting if there's a difference between the two scenarios will be quite simple. There will be measurements of efficiency such as the total time of all cars to reach their goals, total amount of stops or average speed.

Furthermore, if the difference is substantial, simple observation of the simulation would suffice.

5 Blog

The blog used for the project is hosted at our git-repo at KTH's GitHub system.