

Modeling Self Driving Vehicles
Caleb Madsen, Brian Horne, Alex Smith
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Abstract

Traffic is something that influences every aspect of modern society. This is what makes traffic flow optimization so important. Despite there being rules that govern how people behave on the road, people deviate from these rules in various ways, which makes it difficult to find which rules optimize traffic flow. Machines on the other hand, are exceptional at following rules. Hence, machines are the optimal candidate for optimizing traffic flow based on simple rules. Here, we provide a computational model of traffic in which machine driven cars all follow the same set of rules. In an attempt to optimize traffic flow, this model incorporates a discretized set of roads, on which, we aim for maximum occupancy. This means that one of the rules does not allow too many cars on the road at a time, however, this model should help determine how many cars is “too many”. This model takes a set of initial conditions and simulates the motion by coupling advanced slicing techniques with boolean logic and nested for loops. Given the set of rules provided, the motion observed suggests that traffic does still build up at intersections. However, the degree to which traffic is slowed at the intersections, can be varied, by allowing more cars to occupy a given space at each instant.