Simulating Fuel Reduction by Adjusting Velocity to Traffic Lights

Karsten Jakobsen and Sabrine Mouritsen

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Problem

Fuel is a major expenditure
Want to use as little fuel as possible
Drive at constant speed use less fuel than accelerating

Traffic Ligths

Traffic ligths disrupt the flow of traffic
Not allways designed for free flow in all directions
Difficult to adjust speed to traffic light when the phases are unknown

Problem Statement

Is it possible to reduce fuel consumption by adjusting the velocity of vehicles to traffic lights in a real life setting?

Solution

Simulate real world traffic flow on a real world section of road
Calculate a speed to reach the next traffic ligth as it turns green

Assumptions

The used simulator simulates the real world correctly

Information about the traffic lights can be accessed by vehicles

- The GPS locations
- The phases, i.e. light setting time frames

Vehicles

- have a predefined route that is followed and not changed
- know its GPS location
- cannot communicate with other vehicles
- have a constant acceleration and deceleration

Drivers follow the rules of traffic, e.g.

- drives below the speed limit
- do not drive into other vehicles
- wait at a red light
- wait for crossing crossing traffic