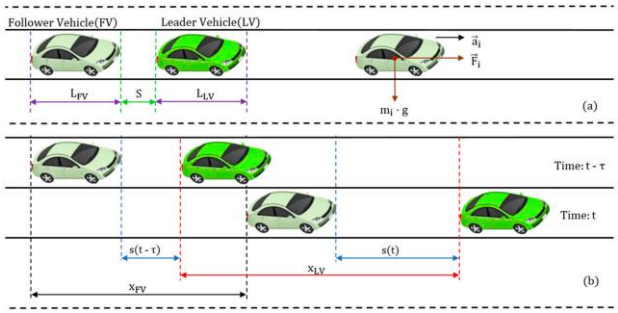

Extending the IDM to Include Multiple Targets

Problem description

The introduction of Automated Vehicles (AVs) is creating a mixed traffic conditions on the roads, consisting of a blend of AVs, human drivers, and vulnerable road users. To maintain the current levels of safety, it's important that all participants in this social system adhere to the same driving rules including not only the formal traffic rules but also the implicit behavioral rules most traffic participants learn through practice. Driving safely in a dynamic environment with multiple road users does not only depend on one's actions, but on the actions of another road participant. This is the case even when one is "just" driving in a single lane. At this moment, TNO is conducting research to model how competent drivers adjust their driving behavior while driving in-lane in highways, and you can contribute to this state-of-the art research!

Objectives & Assignment

In this MSc Thesis you will model car-following behavior. That is, the behavior of a driver that drivers in a single lane while following a vehicle in front (or not). Depending on your own progress, you will work on the following:

- Literature review on the state-of-the art of car-following models that include more than one target
- Select at least two modeling approaches based on their ability of 1) adjusting the host vehicle following distance considering the position of the blue vehicle 2) seamlessly reducing to a typical car-following model when the blue vehicles are not available.
- Fit the model parameters using data of driving and compare them to the standard IDM model.

For this project, TNO will make available three naturalistic datasets that include recording of kinematic variables of the ego vehicle and its surrounding traffic (i.e., speeds, position, accelerations, lane markings, etc.).

This Master thesis includes an internship at TNO

Research group

DiTTlab, Transport & Planning Department

External support

TNO – Netherlands Organisation for Applied Scientific Research

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