

A Simulation Framework for Vehicular Networks

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Description

To evaluate vehicular network performance, a good simulation framework is needed. To get reliable results from any simulator the underlying models must be accurate. Our contribution is to improve an existing simulation environment with new models of the communication channels and improve existing ones.

Background & Motivation

When evaluating ad-hoc vehicular networks with high confidence, realistic simulations are needed.

Example outputs, with realistic time behavior:

- Received power,
- Packet loss or bit error rate.

Use as input to simulations of different control loops of an autonomous vehicle.

Research Goal & Questions

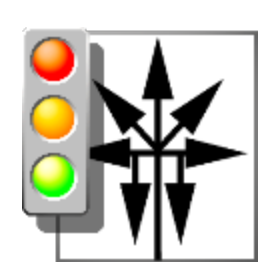
In simulators available today the physical layer is often modeled with very simplistic propagation models.

It is important to accurately capture the time behavior of the received power if these networks are to be used for safety applications.

Methods

OMNeT++, Discrete event simulator

- Plexe/Veins
 - Vehicular network protocols,
 - IEEE 802.11p (and LTE).
- Plexe/SUMO
 - Mobility



New channel models into Veins.

- Model parameters estimated from measurements,
- and can be update as more data become available.

Roadmap & Milestones

The models are planned to be implemented by the summer 2017.

We aim to perform measurements of trucks in a platooning scenario, at AstaZero, for the purpose of improving or building new channel models.

Trucks are big vehicles that often shadow the communication, this needs to be investigated further.

