

This block is responsible for mimicking the communications of an autonomous vehicle in an intelligent infrastructure. V2V, V2I and sensor fusion information must be provided accordingly to the vehicle position and properties.

Projector manager

The projector manager is responsible for the graphical appearance of the simulated world. Things such as text messages, trajectories (predicted and performed), road network, simulated agents, etc... should be represented in a clear manner.

QTM
Mocap

Request to project all graphical data

The command central is a GUI where an external user can give missions to the controlled agents. Then, it is responsible by translating this commands to a global plan that is transmitted to the agents.

Agents' positions
(given by QTM)

Agents' and obstacles' positions

Vehicles' V2V,
V2I and sensors
information

Global plan
(interesting waypoints)

Smart Mobility Lab world

Vehicles' states and road network attributes

Command Central

Agents' states

Agents' states

Agents' states

Data logging

Road network creator

The central block of the system. It is responsible for routing all the information to the right place and make sure they are on the right format. Also, it should be responsible by running a user-generated scenario based on the road network and all the external agents needed. It is also responsible for data logging.

Graphical data, requests for vehicle information (V2V, V2I, sensor information and GPS) and status update

Vehicle state, objectives, V2V, V2I

Agents' positions
(given by QTM)

The agents to be controlled can be either physical vehicles on the lab or simulated agents. The first ones are tracked by the mocap. The second ones are simulated using a vehicle model for example. These blocks represent functions that process the agents' information (either given by a model or by QTM) and outputs the agents' state.

The most important block. The control system is responsible for controlling the agents. It receives commands from the command central as a global plan and then it translates those into logic decisions, maybe with a help of a local planner, and send the actuation commands to the agents. The control system should have as much as possible defined interfaces to enable switching control systems as easy as possible. It is responsible for its own data logging (of the control inputs for example).

Logic

Boolean decision

Local Planner

Trajectory Path

Controller

Data logging

Control System - Research target

Steering angle and velocity

Real scale trucks

