Espaces Numériques de la Mobilité

MOB.04

With the increasing number of real time mobility data flows acquired and broadcast by an ever-growing number of connected sensors, cities are considering new ways to reduce traffic congestion and improve safety. In this context, the MOB04 project focuses on two main objectives: quantify and optimize road traffic, and build a high definition Local Dynamic Map (LDM) of the road network.

Traffic

Optimizing mobility in urban areas requires accurate, real-time information in order to efficiently manage road traffic. The work in this area focuses on developing a light cost-effective solution for traffic assessment and optimization:

- In order to be able to assess traffic in real-time, machine learning methods are being studied in order to infer vehicle traffic from Bluetooth connectivity data. To this end, several sensor prototypes have been designed and on-field experiments have been performed.

- Ubiquitous real-time traffic assessment could allow for new adaptive traffic control strategies. A study is therefore being conducted on real-time control of multiple traffic signals using reinforcement learning methods. The objective is to optimize traffic so as to reach an equilibrium between several objectives such as local/global fluidity of traffic flows in the context of player heterogeneity.
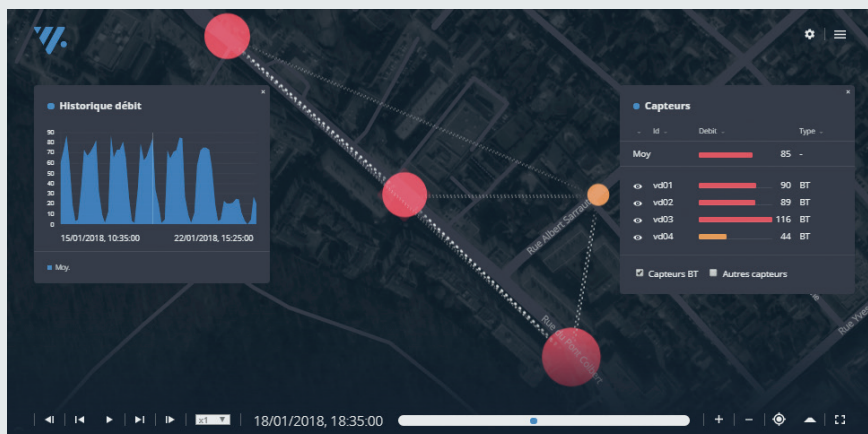
Map

Traffic safety could greatly benefit from a shared accurate Local Dynamic Map (LDM) combining dynamic information (vehicle, pedestrians, road work, etc.) and static layers (standard maps, traffic road signs, etc.). The activity on this topic aims to help build such a map, enhancing its positioning accuracy and localizing vulnerable users.

- Accurate positioning is a key factor towards enhanced safety for both autonomous and human-driven vehicles. To this end, a new computer vision pipeline is being studied in order to automatically build a high definition map of the road network. The chosen approach is collaborative and makes use of the data acquired by the sensors of passing-by vehicles.

- Exhaustive studies on a number of deep learning approaches have shown that detection of people far away from the camera could significantly uplift the current performance figures for pedestrian detection. Work has therefore been conducted in order to propose a new technique for detecting far-away and near-range pedestrians within a single Deep Learning framework.

Mobilité & énergie partagées

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