An efficient City-lab for traffic modeling, estimation and control

Grenoble Traffic Lab- NeCS team
Team objectives and local collaborations

Analysis, Estimation & Control design on networks:

- Objectives related to ITS: Modelling, Estimation, Forecasting, and control for heterogeneous traffic networks using various sources of data

- Collaboration with PATH (UC Berkeley) through COMFORT Associate Team (2014-2016)
Understanding and facing Road traffic congestion

To face congestion in cities a better understanding of traffic dynamics is involved and efficient simulation solutions are needed to assess regulation policies before deployment.

City-scale testbeds spearhead efforts to study and evaluate control systems in realistic arenas accessible to researchers and engineers.

The ultimate goal is the implementation of new control systems to improve the daily lives of drivers and passengers, help traffic operators optimize the network, and reduce energy consumption and environmental impact.
The Grenoble Traffic Lab (GTL)

Grenoble Conurbation
- Same size than Paris
- Population: 439,974 (≈ Long Beach population)
- 5th congested city in France (INRIX ranking 2014)

GTL
- a very dense wireless sensor network deployed on Grenoble South Ring,
- a real-time data-base,
- a show room,
- a calibrated micro-simulator of the Grenoble South Ring and of a part of Grenoble downtown.

http://necs.inrialpes.fr/pages/grenoble-traffic-lab.php

Source: Le figaro
Applications

• On-line Traveling time Forecasting using heterogeneous data sources.

• Distributed traffic control with combined actuations.

• Optimal routing with V2V, V2I, I2V, communication
Next steps

Future works
• Develop and validate models for large-scale urban traffic
• Develop algorithms for optimal fusion of FCD and on-site sensors
• Develop distributed algorithms for traffic control and forecasting for large scale networks.

Expected collaborations with industry
• Traffic data analytics (e.g. Inrix)
• Road Network monitoring (e.g. Grenoble Metro, DIR-CE)
• Traffic regulation solution providers
Thank you

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