

Title of the workshop

Workshop on Modelling, Analysis and Control of Intelligent Mobility-on-Demand Systems

Abstract

After decades of little innovation, personal urban mobility is undergoing rapid transformations due to the introduction of disruptive technologies (e.g. connected and driverless cars), new IT applications (e.g. app-based services) but also due to changes in individual preferences and social behaviours, with a growing trend towards a shifting from car ownership to sharing. This gave new life to several mobility on demand (MOD) services which were ideated decades ago but never established themselves as viable mobility solutions and created new variations of them, such as ride-sharing, bike-sharing programs, car-pooling and car-sharing services, on-demand bus and delivery services, etc. The rapid growth and the forecasted (large) scale of these new mobility services is expected to radically change individual travel patterns, and conventional frameworks for the modelling, analysis, simulation and control of transportation systems are not appropriate any more. For instance, novel demand modelling tools are needed for measuring, modelling and predicting behavioural choice and individual preferences for the new mobility solutions, as well as forecasting the level of market uptake of the different mobility services. Similarly, new analytical models and simulation frameworks are required to accurately characterise the peculiar properties of MOD systems. Then, the insights obtained may serve as basic input to advanced optimization frameworks, which can provide decision tools for the planning and optimal operation of such systems. Key issues to address are infrastructure planning, fleet sizing and management, supply rebalancing, and efficient cooperation with other transportation modes (e.g. public transport).

The goal of this workshop session is to provide a forum to exchange ideas, discuss solutions, and share experiences from industry, researchers and the public sector. We solicit original papers covering different aspects of MOD systems, including modelling, optimisation, management systems, field applications and new paradigms.

Topics of interest include, but are not limited to:

- Data mining, machine learning, and data analytics for MOD systems
- Large scale simulation of agent-based models for MOD systems
- Modelling, analysis, and control of MOD systems
- On-demand mobility in Public Transport
- Cooperative Systems and Connected Vehicles for MOD services
- Autonomous driving for MOD services
- ITS technologies for MOD services
- Social and emergent behaviours for MOD services
- Travel behaviour and travel demand for MOD systems
- Discrete choice modelling for MOD systems
- Field tests and implementation of MOD services
- Cooperation between different modes of MOD
- MOD and Smart Cities
- Complex network theory for MOD systems
- Robotic MOD systems
- Electric MOD systems
- Operations research in MOD systems
- Drones as the new frontier for MOD

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