

Mining electric-bike-user behaviours from smartphone data, with bike-longer

Provide a substantial data foundation and methodological processing protocols to study long-distance electric-bike trips.

Context

The project stems from a broader framework in which Technical University of Denmark (DTU) and Technion (Israel) are among the partners. As a mandatory external stay for fulfilling his Ph.D. studies at DTU, Valentino Servizi will cooperate with Prof. Sagi Dalyot's research group, at Technion

Motivation

A well-implemented bicycle infrastructure network suggests improved mobility in urban areas, with associated benefits of reduced congestion and energy savings. However, the urban space is most often not yet adapted to incorporate bicycles and especially not the new promising opportunities that come with electric bikes. Furthermore, bicycles are generally under prioritized or overlooked in strategic transport models used in city-level mobility planning. To support quantitative analysis of electric-bike-user behaviours and preferences, and thus justify effective policies and sustainable bicycle investments in urban areas, data is lacking.

Tasks, responsibilities and contributions

Valentino Servizi will bring experience and expertise regarding the deployment of a dedicated smartphone-sensing platform, contributing to the selection of smartphone-sensors, data structure, record frequency, database, back-end, and front-end, including publication on App-Store and/or Google-Play. At the same time, he will study and exchange knowledge about the extension of machine learning algorithms suitable to improve the detection of bicycle patterns, which Prof. Sagi Dalyot's team is developing at Technion: For example, transport mode detection, trip purpose imputation, and map-matching algorithms. COWIfonden contributes to supporting some of the extraordinary expenses related to Valentino Servizi's study travel.

Timeline and steps

The project has a 6-month duration and should start in September 2020. The first phase focuses on designing, building, and testing both the sensing platform and the machine learning algorithms. The second phase, after users' recruitment by Technion, focuses on analysing the data collected passively through sensors and, possibly, active surveys.

Next developments

Various indicators will measure the project's success, such as the quantity and quality of the data, ultimately the knowledge on electric-bike users' patterns. In case of success, after Tel Aviv, the project pipeline includes the extension of this data collection and study to other European capitals, such as Copenhagen, Eindhoven, and Prague.