University of Glasgow | College of Science & Engineering

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PhD Studentship

PhD project title:

Real-time travel time estimation and prediction using Bluetooth sensor data

Supervisor: Dr Konstantinos Ampountolas

Funding status: Fully funded for 3.5 years from 1st January 2014 for UK and EU students.

Project description

Until recently, the main impediment to improvements in real-time travel time estimation and prediction has been the (limited) ability of available fixed-point detectors to measure the true state of the traffic network (motorway or urban road) and its response to traffic control measures (e.g. Variable Speed Limits, Ramp Metering or Traffic Signal Control). However, the introduction of new and cheap sensing hardware (Bluetooth sensors) promise significant progress in monitoring the congestion level in traffic networks. In particular, Bluetooth technology has the recent years become an innovative technology for real-time traffic and travel time registration. The aim of this studentship will be to investigate how real-time data from Bluetooth sensors can be used to estimate and predict motorway, arterial and urban link travel times. The PhD student will examine fast macroscopic traffic flow models for motorway and urban road networks for developing travel time estimation schemes, as well as providing fundamental scientific insight into the spatiotemporal propagation of congestion in our cities. The accuracy of the developed estimation schemes will be evaluated with experimental Bluetooth data (and corresponding ground truth from Automated Number Plate Recognition (ANPR) and Automatic Traffic Counters (ATC)) from strategic corridors on the Scottish Trunk Road network (A9 and A96) and the urban road network of Downtown Glasgow.

Funding notes and eligibility requirements

The successful candidate will have a good (1st Class or 2:1 or equivalent) MSc or undergraduate degree in Engineering, Computer Science, Geospatial & Mapping Sciences, Geoinformatics, or Applied Mathematics/Sciences. Applicants with a sound knowledge, interest, and background in Control/Estimation Theory, Optimisation, Operations Research, Traffic Flow Theory, Physics of Transport and Traffic, Big Data Analytics, are welcome to apply for the PhD Scholarship. The ability to learn software programming (C/C++ or Python) and simulation tools (AIMSUN or VISSIM) is essential and prior experience is an advantage. Knowledge of OpenStreetMap API, Google Maps API, or QGIS is an extra advantage. The ideal candidate should be an enthusiastic and self-motivated person with good organisational and interpersonal skills. The PhD scholarship will cover tuition fees and an annual stipend of £13,590 over 3.5 years with an additional research support grant for conference attendance and research expenses. The preferred start date is 1st January 2014. The PhD scholarship is only funded for Home UK or EU students.

Application enquiries

Requests for further information and applications should be sent to Dr Ampountolas (Konstantinos.Ampountolas@glasgow.ac.uk) and include:

1. Covering letter stating the motivation for undertaking this project
2. Curriculum Vitae
3. Contact details of **two** academic referees

We will begin considering applications in November 2013, and applications will be accepted until the position is filled.