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## Seminari de Transport

**9 d'octubre de 2014**

**12:00h, a l'aula B1-005 del Campus Nord UPC (BarcelonaTech)**



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### **Use of Bluetooth data for traffic characterization: Case study of the Brisbane's semi-urban network**

#### **Summary:**

Bluetooth has become a widespread technology in our daily life, which potentially provides a huge quantity of information. By setting up Bluetooth scanners at the main intersections, the road manager can collect the anonymous ID and the entry times of each Bluetooth user. The Brisbane City Council has equipped its network with such scanners, paving the way for the collection of Big Traffic Data. From the network operator's standpoint, this cheap investment would allow deriving traffic states or following some vehicles at a network scale. However, several issues have to be tackled before matching the managers' expectations. Firstly, as every road users are not equipped with Bluetooth, the extracted traffic information remains partial. The reliability and the representativeness of such data need to be accurately assessed. Secondly, as all users' types are detected (pedestrian, bikes, cars), filtering methods are needed. Then, the raw data have to be processed and analyzed in order to create relevant traffic maps and network analyzes. The main purpose of this master thesis is to propose a global methodology for Bluetooth Data processing, from filtering to network monitoring. After estimating the penetration rate, some methods are applied to assess and ensure the reliability of this data source. With respect to traffic estimation and network monitoring, two unsupervised learning methods (LDA and K-means) are used to highlight the main space-time network characteristics.

#### **Bio:**

As a PhD student within LICIT, Pierre-Antoine LAHAROTTE works on the real-time assessment and prediction of the vulnerability of networks according to disturbances such as weather alterations. This work is based on the application of machine learning methods to traffic area. The purpose of this thesis includes the performance comparison of various data sources and especially ones produced by new technologies.

He was awarded the 2013 Abertis research Prize in France and International for his master thesis.