Post-doctoral position “Mobility analyst” at LVMT in relation to the Geolytics research project

Background

The LVMT – Laboratory on City, Mobility and Transport – is a joint research unit at Université Paris-Est, shared by Ecole des Ponts ParisTech (ENPC), IFSTTAR and UPEM. It is an interdisciplinary laboratory dedicated to the holistic understanding of territorial systems, their population as a society and their mobility. Its research projects associate Human and Social Sciences (geography, sociology and economics) to Engineering Sciences (traffic physics, behavioral and economic modeling, complex system modeling and simulation).

The Geolytics project is an R&D project that started in end 2016 and will be concluded in early 2019. The research consortium encompasses two start-ups (IT4PME and Milanamos), two more established yet still innovating companies (Coyote, SFR), the standardization body W3C and two research and education bodies, namely the Telecom ParisTech team specialized in data science and the ENPC-LVMT team specialized in mobility modeling.

The research aim is to analyze detailed and continued passenger tracking (based on smartphone geolocalization) in order to depict individual profiles of mobility-making as well as the usage of places and the multimodal conditions of access to and from them – both in real time and off-line. This involves massive data collection and their analysis using Artificial Intelligence algorithms, including the design and software development of specific functions.

Missions

The research objectives consist in characterizing and analyzing individual mobility patterns on the basis of massive geo-localized data (by methods developed elsewhere in the project: statistical and machine learning):

1/ Based on individual « timelines » (e.g. log of position over few minutes intervals), from which activity schedules will be inferred, the post-doc will characterize patterns and analyze mobility behaviors.

2/ Having revealed activities schedules, the post-doc will investigate the recursion, routine-building, regularities and heterogeneity of individual mobility behaviors, at day-level, week-level, month-level. It will in particular question the recurrent frequentation of homes, workplaces, study places, shopping areas, service areas.

3/ Based on revealed activities schedules, the post-doc will characterize the inter-individual heterogeneity of mobility behaviors, questioning the determinants of this heterogeneity, using external data. Simple models will be taken and/or developed to infer individual characteristics and mobility demand in a given territory at a given time.

Profile

PhD in Geography / Economy / Planning / Sociology with strong quantitative background.
Prerequisite: basic statistical skills and command of GIS tools.
Previous knowledge of research on individual mobility.

Organization for an 18 month-long position

Throughout the project: Literature review and benchmark of methods
M1 to M6: « timeline » and work on activity schedule
M7 to M12: analyzing intra-individual and inter-individual regularity

M13 to M18: inferring individual characteristics and travel demand for a given territory at a given time.

Outputs

- One paper of literature review, as project goes forward.
- At least one paper in an peer-reviewed international journal about the scientific contributions of the post-doc.
- Several technical reports.

Working environment

18 month position to begin in June or July 2017
Location at LVMT, Building Bienvenue, 16-18 Avenue Newton, Cité Descartes, Champs-sur-Marne, 77455 Marne la Vallée
Wages in relation to professional experience (reference level at about 1,800 euros just after PhD defending)
Candidature expected April 30th, 2017
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