

## **Post-doctoral position “Mobility analyst” at ENPC-LVMT in relation to the Geolytics and Urban Mobility research projects**

### ***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 mid 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.

The Urban Mobility Chair is an academic and research partnership between ENPC and Ile de France Mobilité, the Transit Organizing Authority of the Paris region. Prominent among its research aims is the topic of traffic econometrics on the basis of Automated Fare Collection Data (the Navigo system) and Automated Vehicle Location data (mostly GTFS data from the transit operators including RATP and SNCF-Transilien).

### ***Missions***

Both the Geolytics project and the econometric topic at the UMC rely upon datasets collected massively on vehicle and passenger trips. There are 4 kinds of data: (i) FCD from the Coyote system of dynamic information on roadway traffic, (ii) FMD from the Geo4Cast mobile app developed by IT4PME, (iii) AFC from the Navigo system, (iv) AVL from Ratp and Transilien.

The research objectives consist in exploiting such geo-localized data in order to analyze mobility along the following three research directions:

- (1) The characterization of travel times on a roadway network with respect to places and origin-destination pairs. The aim is to assess “local fluidity” and to detect “hot spots” that exhibit severe congestion.
- (2) The characterization of mobility practices and behaviors: for any person whose trips have been monitored during several days, characterize a “mobility physical profile” in terms of places visited, number of trips per day, distance travelled per day, travel modes utilized. Early results already achieved are to be further developed along issues such as “week mobility versus weekend mobility” and “evening leisure activities”.

- (3) The analysis of spatial relationships between places on the basis of the location of people along time and of their trips between places.

Specific requests need be created and programmed to produce relevant information on the basis of data. These will be organized in “Analysis programs” targeted to deliver synthetic indicators and meaningful illustrations (dataviz issue). Each research direction will give rise to a sample application.

## **Profile**

PhD in Geography / Economy / Planning / Sociology with strong quantitative background.

Prerequisites:

- Basic statistical skills and command of GIS tools.
- Previous knowledge of research on individual mobility.
- Skills in programming. Existing code is in R, the candidate must be able to understand it, use it and develop complete it
- Skills in SQL, NOSQL and ML would be a plus
- English proficiency

## **Outputs**

- At least one paper in a peer-reviewed international journal about the scientific contributions of the position.
- Several technical reports.

## **Working environment**

12-13 month-long position to begin in December 2018 or January 2019

Location at LVMT, Building Bienvenue, 16-18 Avenue Newton, Cité Descartes, Champs-surMarne, 77455 Marne la Vallée

Wages in relation to professional experience (reference level at about 1,800 euros just after PhD defense)

Candidature expected 5 November 2018

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