

Postdoctoral Associate

Future freight and logistics survey: integrated data collection using mobile sensing, wireless communication and machine learning algorithms

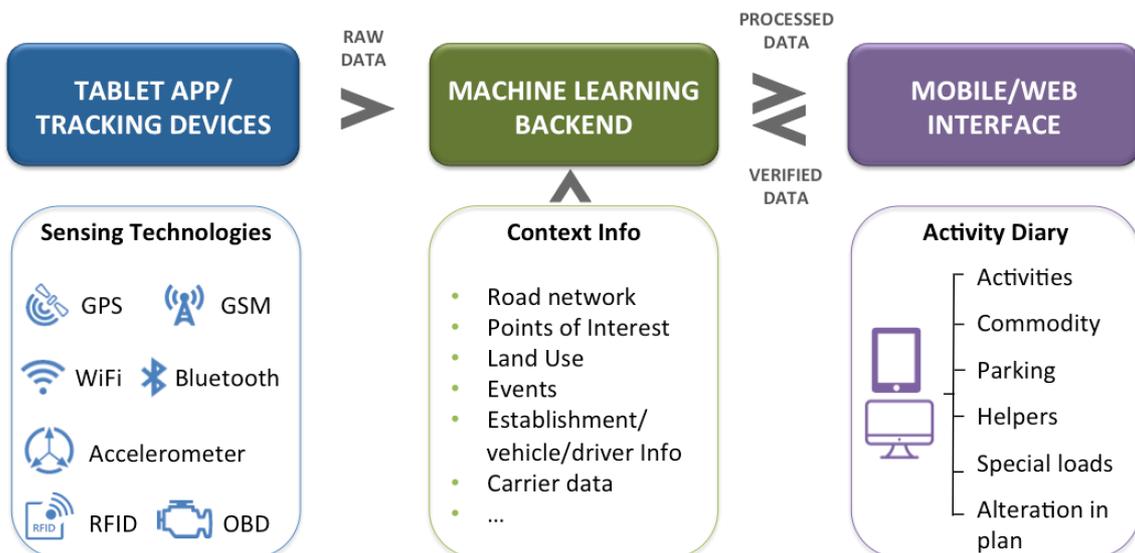
Intelligent Transportation Systems (ITS) Lab
Department of Civil and Environmental Engineering
Massachusetts Institute of Technology (MIT)

The ITS Lab is seeking a postdoctoral associate with strong project management and software skills to develop advanced technologies for freight data collection.

Project overview

This project intends to create a new framework that leverages innovative technologies for freight data collection through truck tracking and truck driver surveys, shipment tracking, and establishment surveys. The framework is based on innovative and scalable technologies with time and geographical coverage (national, urban and intercity contexts), and it aims to ameliorate inherent limitations in current freight data collection methods. The proposed tool will be tested in an urban case study and an intercity case study in the US.

The underlying concept for data collection is Future Mobility Sensing (FMS), which integrates various technologies within a personal-device based system. The system consists of three components: 1. tablet app or tracking device which collects location data of trucks or shipments 2. the backend server which processes the raw data using machine learning techniques; 3. a user interface which presents the processed data back to the user in the form of a diary of their travel and activities. The user is asked to verify the data and answer additional questions about their activities. The following figure depicts the main components of the system.



Job description

Under limited supervision, the postdoctoral associate is expected to take management responsibility for the project and play a main role in research, implementation, and survey coordination activities, including:

- developing a system for tracking shipments based on GPS and/or other types of tracking technologies;
- assisting in managing the efforts of a third-party survey vendor that is expected to assist in the data collection.
- defining a comprehensive and holistic methodology for integrated freight data collection, leveraging various types of data sources, and investigating possible synergies and integrations with traditional commodity flow surveys;
- exploring innovative survey instruments for commodity flow surveys and establishment surveys to minimize respondent burden and increase data quality;
- exploring new opportunities for the survey recruitment process and for collaborative schemes between public data collectors and private stakeholders;
- investigating relevant prospects for improvement in freight modeling, leveraging next-generation freight data collection;

The candidate is also expected to contribute to official project reports, supervise students working on the project, regularly meet with supervisors, and disseminate research findings in journals and conferences.

Requirements

We are looking for exceptional candidates with strong backgrounds in relevant areas including:

- a Ph.D in transportation, freight, logistics, computer science or a related field;
- experience in freight and logistics modelling, survey design;
- GIS programming, data mining/web scraping and software development experience

This position will be based at MIT's ITS Lab in Cambridge, MA, for a duration of two years and a full-time commitment to the project. The postdoctoral associate will work with an integrated team of faculty, researchers and students from MIT under the supervision of Prof. Moshe Ben-Akiva and also in close collaboration with Vittorio Marzano from the University of Naples Federico II (Italy). The postdoctoral associate will also work in close cooperation with the Singapore-MIT Alliance for Research and Technology (SMART) research team based in Singapore.

Interested applicants should submit a cover letter, CV, and a list of three references to ben-akiva@mit.edu with subject line "Freight Postdoc ITS Lab". Please notice that only shortlisted candidates will be notified.