



Singapore-MIT Alliance for Research and Technology



Postdoctoral Associate - Freight Survey and Modelling

Future Urban Mobility Interdisciplinary Research Group

Singapore-MIT Alliance for Research and Technology Centre

SMART is a major research enterprise established by the Massachusetts Institute of Technology (MIT) in partnership with the National Research Foundation of Singapore (NRF). SMART serves as an intellectual hub for international research collaborations, not only between MIT and Singapore, but also involving researchers from the region and beyond. At SMART, we identify and carry out research on critical problems of societal importance. SMART is a magnet attracting and anchoring global research talent, while simultaneously instilling and promoting a culture of translational research and entrepreneurship in Singapore. Five interdisciplinary research groups (IRGs) have been established to date: BioSystems and Micromechanics (BioSym), Centre for Environmental Sensing and Modelling (CENSAM), Future Urban Mobility (FM), Infectious Diseases (ID) and Low Energy Electronic Systems (LEES)

Project Overview

A key research task ongoing at SMART is providing next-generation data collection, modeling and solutions for urban freight and city logistics. An integrated framework for urban freight data collection is being developed at SMART and SUTD. 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 or/and logistic activities. This project intends to create a new generation of Commodity Flow Surveys that leverages innovative technologies for freight data collection through truck tracking and truck driver surveys, shipment tracking, and establishment surveys. Such new data will be used for the development of agent-based urban freight behavioral models, covering all relevant agents, their mutual interactions along supply chains and their relationship with the individual choices and land use patterns. Freight models will be fully integrated within SimMobility, a state-of-the-art, multi-scale agent-based passenger simulation model already developed at SMART that considers land-use and transportation networks along with individual choices and decisions at different levels of resolution.

Responsibilities

The Future Urban Mobility Interdisciplinary Research Group is currently seeking a postdoctoral associate, based at the SMART Centre in Singapore. The job scope is as follows:

- Investigate relevant prospects for improvement in freight data collection, modelling, leveraging next- generation freight data collection;
- Design, test, and collaborate on the implementation, execution and analysis of the new commodity flow survey. Coordinate the survey between SMART/SUTD, government agencies, and survey companies;
- Develop the freight and logistics related behavioural models;
- Presenting research results at international workshops, conferences, and exhibits as well as at internal project meetings; co-authoring articles for publication in top-tier, peer-reviewed journals and conferences,
- Monitoring the progress of project components, supervising PhD students, and regularly meeting with Principle Investigators.

Requirements

The candidate should have the following:

- Ph.D in Transportation, freight or logistics;
- Experience in the design, implementation and analysis of surveys or similar data processes.
- Experience in freight and logistics behavioural modelling;
- Experience with programming in scientific languages (e.g. Python, R, and Matlab);
- Excellent academic standing, positive work attitude, good communication and interpersonal skills and an ability to work independently and in multi-disciplinary teams.

Candidate with any of the following will have an advantage:

- Familiarity with transportation simulation;
- Experience with geoprocessing tools (QGIS, ArcGIS, and PostGIS) and databases;

Collaborating entities include the Massachusetts Institute of Technology (Cambridge, MA, USA) and local authorities in Singapore – including the Land Transport Authority (LTA) and the Urban Redevelopment Authority (URA). The research team is led by Prof. Moshe Ben-Akiva and Prof. Chris Zengras (MIT), Dr. Fang Zhao (SMART), and Prof. Lynette Cheah (SUTD).

To Apply

Interested applicants should send a motivation letter expressing specific interest in the position and a detailed CV with information on education qualifications, work experience, list of publications, the contact details of two referees and citizenship status to andrew.tong@smart.mit.edu and CC: andre.romano@smart.mit.edu. Subject should read : **Postdoctoral Associate – CFS**. We regret that only shortlisted candidates will be notified.