



POST-DOCTORAL RESEARCH FELLOWSHIP

Agent-based Simulation of Pedestrian Movement and Transportation Systems at the Urban Scale

The University of British Columbia (UBC) is consistently ranking among the 40 best universities globally, and now places among the top 20 public universities in the world. The university strives to create an exceptional learning environment that fosters global citizenship, advances a civil and sustainable society, and supports outstanding research to serve the people of British Columbia, Canada and the world.

In recent years, UBC has developed a special role in research and development of future smart, integrated communities. UBC is one of the largest university campuses in North America with a daily population of over 60,000, and permanent residential population exceeding 15,000. It is one of few university campuses globally that operates independently, similar to a municipality, and also one of few universities that has developed [its own permanent residential community](#). UBC's [Campus as a Living Lab](#) (CLL) platform is a growing research apparatus, allowing the university's researchers to gain direct access to the university's data infrastructure in order to facilitate novel studies in urban systems research and sustainable urban development.

In 2018, a new collaborative research cluster on Smart, Future Cities was established at UBC by the [UBC Sustainability Initiative](#) (USI), the [Energy, Technology, and Architecture](#) (ETA) Lab, and the [Urban Predictive Analytics Lab](#) (UPAL). The cluster would develop new data-driven techniques for modelling future low-carbon building and transportation design scenarios at the urban scale, using the UBC CLL as a research platform. This position is one of the first to emerge from this cluster.

Job description

The USI and its collaborators are inviting applications for a full-time postdoctoral research fellow in the field of Agent-based Pedestrian and Transport Simulation at the Urban Scale. The appointment is for one year, with a strong potential for extension. The expected starting date is January 1st 2019 (negotiable).

The research will initially focus on the adaptation of prevailing agent-based modelling platforms of transport system (i.e., MATSIM) for the UBC campus, and assess the feasibility of developing new bespoke simulation tools that extend the capability of existing platforms. One intended novelty of the work is to make use of a prototypical human movement monitoring system based on WiFi data, [developed and trialled at UBC](#), to integrate and calibrate pedestrian movement predictions across the university campus. One of the expected outcomes of the work is to inform the spatial development of a mass rapid transit transportation system that will serve the university campus within the coming decade.

The incumbent is expected to co-publish in top tier academic journals advancing the research agenda around smart cities, urban science, data science and visualization, etc. Additionally, the incumbent will work with the USI Urban Innovation Research Group to develop industry, professional and publicly facing materials, expanding the knowledge dissemination beyond academic circles to practitioners and policy-makers. The supervision committee will provide oversight and guidance on publications.

The incumbent will also contribute to funding proposals that arise periodically to advance the research goals of the program and the broader USI mandate. There will also be opportunity to gain experience with lecturing and of mentorship of graduate students.

Qualifications

A suitable background for this position is a PhD involving applied simulation modelling using agent-based models, preferably the MATSIM platform for agent-based transport planning. Excellent programming skills are required. Additional knowledge within the following fields of data visualization, risk factor analysis, Bayesian methods for inference and prediction, machine learning, artificial neural networks, as well as longitudinal and time-series data analysis are desired.

The successful applicant should have an excellent academic track record. The project steering group is looking for a strongly motivated candidate who can work both independently and in a team. Experience with project and team management is a plus. The applicant will actively participate in the different phases of the research process, from its conception to writing for publication. An excellent command of English is necessary.

Supervisor and Resources

This post-doctoral fellowship is intended to be an independent research position providing the successful candidate flexibility and autonomy in establishing a work scope and timeline. The successful candidate will be provided sufficient infrastructure and resources in terms of computational software and hardware in order to carry out the proposed research.

The appointment is with the USI and is part of the Urban Innovation Research Group, an interdisciplinary research collaborative focused on advancing sustainable projects, practices and policies for urban development and the future of cities. Work space will be provided in the Centre for Interactive Research on Sustainability (CIRS), UBC's flagship building and hub for advanced research on urban science and sustainability. The candidate may also have the opportunity to co-supervise graduate student researchers and undergraduate student research assistants, dependent on project work and funding. Overall academic supervision to the project will be provided by a steering group comprising Professors Adam Rysanek (School of Architecture and Landscape Architecture), James Tansey (Sauder School of Business) and Martino Tran (School of Community and Regional Planning).

Further information and applications

For further information regarding the position, or to submit a CV and cover letter, please write to Dr. Adam Rysanek (arysanek@sala.ubc.ca).

Deadline for applications is October 31, 2018.

About Vancouver

The Metro Vancouver area is an internationally-renowned city – and the 3rd largest in Canada. Consistently ranked as one of the [world's most livable cities](#), it is where snow-capped mountains meet the ocean, breath-taking vistas greet you around every corner, and a diversity of communities, cultures, and ethnicities meet you at its core.