2 Post-doctoral positions with the McGill Sustainability Systems Initiative

Montreal Sustainability Dashboard: Developing an interactive, open platform for urban sustainability research, engagement and policy

We seek two post-doctoral researchers to help develop the Montreal Sustainability Dashboard (MSD), a platform for integrating sustainability knowledge at the regional scale to improve research, policy making and public engagement. The project will build on the 'Adapting Urban Environments for the Future' theme of the McGill Sustainability Systems Initiative (MSSI). Adapting Urban Environments for the Future is "an integrative program of research on urban sustainability that will generate and mobilize the knowledge required to make cities more socially inclusive and less environmentally impactful, while improving the well-being of residents."

The post-doctoral researcher will take a leading role in developing and implementing the MSD. The researcher will be jointly supervised by Andy Gonzalez (Biology), Kevin Manaugh (Geography and School of Environment), and David Wachsmuth (School of Urban Planning).

The Montreal Sustainability Dashboard concept

Urban sustainability is a complex, multidimensional concept encompassing a variety of stakeholders, values and priorities. Individuals, households, and firms make decisions about mobility, consumption, supply chains, and location in the context of the built and natural environment as well as policies, regulations, and social norms, much of which are under some degree of control of local, regional, and federal decision makers. Sustainability permeates every decision we make and every relationship we maintain, but the connections between individual decisions and long-term outcomes are so complex and involve so many subjective comparisons that we rarely feel empowered to say, objectively, that we have made the best decision.

In the twin contexts of global climate change and the ongoing urbanization of human society, cities in Canada and internationally are facing the increasingly urgent need to reduce their environmental footprints and to prepare for heightened environmental threats. Can urban sustainability decision making be radically improved, both for research and for policymaking? How can academic researchers properly assess interlinkages between different aspects of urban sustainability? If local policymakers have the desire to make empirically informed decisions on environmental questions, what infrastructure exists to support them? The Montreal Sustainability Dashboard (MSD)—an online platform for integrating sustainability data and enabling complex scenario modelling—addresses these challenges, transforming subjective decisions into objective ones using a range of data sources integrated into meaningful relationships.

Montreal is an important international hub linking francophone and anglophone cultures in North America, Europe and Africa. The city is home to 60 international organizations (several, such as Future Earth, with urban sustainability as a core agenda), and was the first Canadian member of 100 Resilient Cities, an international network funded by the Rockefeller Foundation. As a midsize city with 4 million inhabitants, it is typical of the majority of the world's cities. Like many midsize cities it is also experiencing population growth and faces the challenges of urban sprawl (driven by migration from the city) and inner city densification.

Responsibilities

We are seeking two exceptional individuals with the expertise to spearhead the development of the MSD platform. The successful candidates' main task will be modelling and visualizing datasets provided by various public, civil society and private-sector entities, including but not limited to environment, urban ecology, telecommunications, healthcare, transportation, and urban or municipal planning. Appropriate candidates may come from a variety of academic backgrounds and experiences.

We envisage the researchers working in a collaborative, multidisciplinary setting, to best utilize the diverse expertise and knowledge of the team members. We expect the researchers to work with our partners in the city of Montreal, and other regional municipalities, and be able to discuss his/her work with a diverse audience, including scientists from diverse fields, government officials, NGOs, and local stakeholders.

Responsibilities include working with Montreal Sustainability Dashboard researchers, collaborators and sponsors to:

- Collaborate with data scientists to identify research questions and aggregate data in an actionable way.
- Design data visualization tools and platforms for a variety of research projects.
- Prototype these tools (both the front and back end) through an iterative approach.
- Evaluate the usability and the usefulness of these tools with potential users.
- Create animations and videos based on data provided from research projects.

The ideal candidates will have:

- A PhD in a relevant field of sustainability science (e.g., geography, urban planning, urban ecology) or computer science (e.g. machine learning). Candidates with experience in visual design or media are welcome.

- Expertise in at least one of the following research areas:
    - GIS spatial analysis and mapping
    - Ecological modeling
    - Programming experience in R, Python, and/or SQL. (C++, Java, Hadoop, MapReduce and other relevant technologies would also be an asset.)
    - Machine learning
- Expertise in handling large datasets, as well as overcoming limited data.
- Excellent communication and organizational skills, self-motivated work ethic.
- Experience working on large multi-disciplinary projects involving multiple stakeholders.
- A strong research publication record in the applicant's relevant field.
- Multi-disciplinary expertise and French language proficiency are assets.

The positions are for two full-time post-doctoral researchers beginning after May 31st, and offer full funding for 2 years. We offer a competitive remuneration package, and additional benefits such as networking and training opportunities with the Trottier Institute of Sustainability in Engineering and Design (TISED) and the Quebec Center of Biodiversity Sciences (QCBS).

How to apply

Applications should be sent to mssi@mcgill.ca as a single pdf document, with the subject line: “MSD post-doc” by May 31st, 2020. The pdf should include:

1. A one-page cover letter, introducing yourself and highlighting your interest in and fit for the position
2. Curriculum Vitae
3. Full-text attachments of 1-3 key relevant publications
4. Names and contact information of 3 referees.

We will begin evaluating applications on May 31, and will fill the positions once the right candidates are found.