



PhD Position: “Towards low-carbon cities: Development of new simulation techniques for long-term building retrofit planning”

The Pacific Institute for Climate Solutions (PICS) is a dynamic knowledge network that brings together leading researchers from British Columbia (BC) and around the world to study the impacts of climate change and to develop positive approaches to mitigation and adaptation. Created in 2008 with a major endowment from the BC Ministry of the Environment, PICS is hosted and led by the University of Victoria in collaboration with BC’s three other research-intensive universities: Simon Fraser University, the University of British Columbia and the University of Northern British Columbia.

Energy Efficiency in the Built Environment is an overarching research project established under Phase II of PICS’ strategic research plan in 2014. The project is led out of the School of Architecture and Landscape Architecture (SALA) at the University of British Columbia (UBC). **The project is now looking for an excellent doctoral candidate** to undertake research and development of novel simulation techniques that improve long-term low-carbon retrofit planning at the building and/or city-scales.

Topics of interest for research include:

- Machine learning-based classification and regression of building data for energy simulation
- Multi-investment period optimization of retrofit decisions
- Development of climate- and policy-resilient retrofit pathways for future cities
- Integration of Mixed-Integer Linear Programming (MILP) energy supply / demand modelling with building performance simulation
- Probabilistic simulation of energy demand, consumption, and greenhouse gas emissions for retrofit planning at the city-scale
- Bayesian calibration of urban-scale energy models

The successful candidate should possess a Masters or Diploma degree in Architecture, Engineering (Mechanical, Civil, or Architectural preferred), or a related field. Ideally the candidate will have prior practical and/or research experience with building simulation tools. The candidate should be familiar with scientific programming languages (i.e., Python, MATLAB, etc.) and data management. Fluency in English, written and spoken, is a requirement.

As an independent researcher, the successful candidate will have the ambition and skillset to produce top-level publications for international conferences and high impact journals. The candidate will also have strong interpersonal skills and first-hand experience in relating work to non-academic professionals in the buildings industry.

The research will be supervised by Dr. Adam Rysanek, Head of the η lab and Assistant Professor of Environmental Systems at School of Architecture and Landscape Architecture (UBC). The candidate will be physically based at the Center for Interactive Research on Sustainability at UBC Vancouver’s campus, and will have the opportunity to pursue their degree within either the Department of Mechanical Engineering (co-supervised by Professor Steven Rogak) or within the UBC Interdisciplinary Studies Graduate Program.



THE UNIVERSITY
OF BRITISH COLUMBIA



Dr. Adam Rysanek
Assistant Professor of Environmental Systems
School of Architecture and Landscape Architecture, UBC

Candidates for a Doctor of Philosophy in Mechanical Engineering should apply via the UBC Department of Mechanical Engineering graduate student application portal: <https://www.grad.ubc.ca/prospective-students/graduate-degree-programs/phd-mechanical-engineering>

First cohort application deadline: Dec. 1, 2017
Position Start Date: Sept. 1, 2018

Candidates for a Doctor of Philosophy in Interdisciplinary Studies should apply via the UBC Interdisciplinary Studies graduate student application portal: <https://www.grad.ubc.ca/prospective-students/graduate-degree-programs/phd-interdisciplinary-studies>

First cohort application deadline: Jan. 8, 2018
Position start date: Sept. 1, 2018

Remuneration and Fees: A 4-year funding package will be awarded to the successful candidate to support living costs in Vancouver and tuition fees.

About UBC and Vancouver: The University of British Columbia is consistently ranking among the 40 best globally, and now places among the top 20 public universities in the world. The University of British Columbia 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. It offers affordable, competitive tuition fees and a number of scholarships, awards, top-ups to external awards, entrance fellowships, Research Assistantships (RA's) and Teaching Assistantships (TA's) to its students. The Metro Vancouver area is an internationally-renowned city – and the 3rd largest in Canada. Consistently ranked one of the world's most livable cities, it is where snow-capped mountains meet the ocean, breathtaking views greet you around every corner, and a diversity of communities, cultures, and ethnicities meet you at its core.

For further information or questions about this position, please contact Dr. Adam Rysanek, (arysanek@sala.ubc.ca).

This project is sponsored by:



Pacific Institute
for Climate Solutions
Knowledge. Insight. Action.



MASc or MASA Position: “Novel approaches to building performance data collection, management, synthesis, and visualization across large building stocks”

The University of British Columbia is one of the largest universities in North America. It represents a community of over 49,000 students, 13,000 faculty and staff, and a sizable residential population on its campus. UBC manages approximately 500 buildings, covering 402 hectares of land. The university also owns and operates its own utilities including electrical, heating, water and waste, and is responsible for its own physical infrastructure – including its roads. This provides the context for UBC’s Campus as a Living Laboratory initiative, <https://sustain.ubc.ca/our-commitment/campus-living-lab>, which has been established, in part, to assist UBC’s researchers engage with its building stock and building data.

However, whilst it’s been administratively possible for researchers to collect and analyze building performance data across UBC’s building stock, its proven to be a technical challenge. UBC’s building stock possess a diverse array of building management systems (BMS) and sensor networks that have not yet been reconciled with a common data collection and management system. This has turned out to be an interesting question for data-driven research on the performance of *existing* buildings: what processes, technologies, or techniques can be deployed to rapidly collect and synthesize real time environmental and energy consumption data across a large building portfolio? This project is looking for an excellent Masters research candidate to take this

Topics of interest for research include:

- Automated techniques for inferring building data point metadata for legacy building management systems
- Spatiotemporal visualization of building performance data
- Development of large cloud-based databases for real-time monitoring of electricity, heating, and cooling energy consumption across a building stock

The successful candidate should possess a Bachelor’s degree in Applied Science or Engineering, Computer Science, or Design. The candidate should be familiar with scientific programming languages (i.e., Python, MATLAB, etc.) and data management. Fluency in English, written and spoken, is a requirement.

As an independent researcher, the successful candidate will have the ambition and skillset to produce top-level publications for international conferences and high impact journals. The candidate will also have strong interpersonal skills and first-hand experience in relating work to non-academic professionals in the buildings industry.

The research will be supervised by Dr. Adam Rysanek, Head of the η lab and Assistant Professor of Environmental Systems at School of Architecture and Landscape Architecture (UBC). The candidate will be physically based at the Center for Interactive Research on Sustainability at UBC Vancouver’s campus, and will have the opportunity to pursue their degree within either the Department of Mechanical Engineering (co-supervised by Professor Steven Rogak) or within the School of Architecture and Landscape Architecture

Candidates for a Master of Applied Science in Mechanical Engineering should apply via the UBC Department of Mechanical Engineering graduate student application portal: .

<https://www.grad.ubc.ca/prospective-students/graduate-degree-programs/master-of-applied-science-mechanical-engineering>

First cohort application deadline: Dec. 1, 2017

Position Start Date: Sept. 1, 2018



THE UNIVERSITY
OF BRITISH COLUMBIA



Dr. Adam Rysanek
Assistant Professor of Environmental Systems
School of Architecture and Landscape Architecture, UBC

Candidates for a Master of Advanced Studies in Architecture should apply via the UBC Interdisciplinary Studies graduate student application portal: <https://www.grad.ubc.ca/prospective-students/graduate-degree-programs/master-of-advanced-studies-architecture>

First cohort application deadline: Jan. 15, 2018

Position start date: Sept. 1, 2018

Remuneration and Fees: A 2-year funding package will be awarded to the successful candidate to support living costs in Vancouver and tuition fees.

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For further information or questions about this position, please contact Dr. Adam Rysanek, (arysanek@sala.ubc.ca).