

Student assistant position with master's thesis (8 months)

Background

The research group 'Land, Transportation and Infrastructure' at MCC is recruiting a student assistant to support the development of a European-scale building energy model and database. The research project involves gathering and harmonizing 3D building datasets, and filling data gaps with machine learning (ML) to develop a consistent database. This database is the first part of a European-scale modelling framework that aims to investigate energy use for heating and cooling buildings, as well as policy options to decarbonize the sector.

The student assistant would support the development of the database and help upscale a proof-of-concept from the group that predicts building heights from urban form data in OpenStreetMap. We offer to prepare a Master's thesis in parallel, on extending this methodology to another energy-relevant building attribute, for example building ages.

Your tasks as student assistant:

- Building on current efforts in the group, searching for open 3D building datasets in Europe
- Analyzing the coverage of buildings where the height is available from OpenStreetMap in Europe
- Preprocessing 3D building data and harmonizing data in a common database
- Supporting the development and maintenance of the database
- Undertaking feature engineering using an existing set of tools developed in the group
- Contributing to publications linked to the project

Thesis proposal:

- Extending our ML-based framework for predicting building heights from urban form to another energy-relevant building attribute; possible relevant attributes include building age or building usage
- Searching for relevant datasets for training data across Europe
- Identifying the specificities of the prediction problem for the given building attribute
- Undertaking additional feature engineering or additional input preprocessing as relevant
- Investigating the potential of (spatial) ML algorithms as relevant, in addition to the methods we are currently using (tree-based ensemble methods and computer vision)
- Designing and undertaking experiments to test the model and the main hypotheses underlying the model's development

What we offer:

- Opportunity to contribute to a scientific project, with an international interdisciplinary team, and with the perspective of scientific publications
- Flexible working time
- Remote-friendly (in Germany)
- Access to high-performance computing infrastructure
- Payment at union rates (brutto 12,50 € / hour)

The ideal candidate:

- *must* be enrolled in a university Master's program in Germany
- has programming skills (Python) and experience with data management; experience with geospatial data is a big plus
- has interest in or experience with machine learning
- has interest in or experience with urban sustainability issues
- has good English skills and enjoys working in a cooperative environment

The student assistant position has a fixed term of 8 months, with 20h per week. Ideally, a master's thesis would be conducted in parallel, with 2 months of scoping and 6 months of research, under the supervision of Prof. Dr. Felix Creutzig and Nikola Milojevic-Dupont.

Applications will be reviewed from **November 9** until the position is filled.

Send your application by e-mail to Nikola Milojevic-Dupont (milojevic@mcc-berlin.net) including a CV and a cover letter.

MCC seeks to achieve gender equality and diversity. We encourage applicants of diverse backgrounds. More information on MCC's equal opportunity strategy is available [here](#).

About MCC

The Mercator Research Institute on Global Commons and Climate Change (MCC) was founded in 2012 by Stiftung Mercator and the Potsdam Institute for Climate Impact Research (PIK) and since 2014 it is affiliated with the Technical University (TU) Berlin. Our research is carried out in seven working groups and one special task force and it addresses the grand challenges of climate change and of governing the global commons. Our research is rooted primarily in economics and other social sciences. We provide scientific policy advice and aim to identify policy-relevant solutions. Cooperation with high-profile international partner organizations provides a network of excellence and fosters the high quality of the research at MCC. Within a few years, MCC has established itself prominently in the climate policy research landscape, ranked as No. 1 of climate think tanks in Europe.

For more information about the institute, please visit www.mcc-berlin.net.