Sasu Karttunen

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Curriculum vitae
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ABOUT ME

I'm a meteorologist and a geoscientific model developer, currently working as a doctoral researcher at the University of Helsinki. My research focus has been modeling and measurement of urban boundary layers and turbulence, from micro to mesoscale. I'm currently focused on submitting my PhD thesis for examination by the end of 2024, and looking for new opportunities from the EU/EEA area from the January 2025 onward.

My research focus has been modeling and measurement of micro to mesoscale dynamics, processes and interactions within atmospheric boundary layers in urban areas. In my research, I have combined both modeling (large-eddy simulations) and observational (lidar and in-situ measurements) methods at turbulence-resolving temporal and spatial scales.

I'm the author and developer of the single-layer urban surface model (SLUrb) in the PALM model system, which is an advanced and state-of-the-art meteorological modeling system running on high-performance computing (HPC) environments (see https://palm.muk.uni-hannover.de/).

CORE KNOWLEDGE AREAS AND SKILLS

Meteorology and atmospheric science	I have strong theoretical and practical background in atmospheric science, especially on boundary layers and turbulence. I have over 7 years of work experience with a very wide range of datasets from the fields of weather, climate and earth observation.
Data science	I'm accustomed to working with big n-dimensional datasets, such as the terabyte-scale outputs from the PALM model and atmospheric reanalysis data. **Python**, **NumPy** and **SciPy** (base tools), **xarray** (handling n-dimensional gridded data), **Pandas** (handling measurement time series), **scikit-learn** (analysis models and pipelines), **statsmodels** (statistical testing), **PyCWT** (wavelet analysis), **dask** (scaling/parallelizing data processing and analysis tasks), **gdal** (geospatial data processing) and **matplotlib** (visualizations).
Model development	I have good theoretical and practical knowledge on physical modeling, numerical methods, high-performance computing and model development. This is demonstrated by my implementation of an urban surface energy balance model in the PALM model system, integrating a complex physical system into a numerical model. I'm accustomed with good development practices, such as version control, testing, and good collaboration with other developers.

WORK EXPERIENCE

Doctoral researcher **2020–**
University of Helsinki
PhD project on micro to mesoscale dynamics, processes and interactions within atmospheric boundary layers in urban areas using high-resolution modeling methods and novel measurement techniques. Involvement in a range of additional projects beyond the PhD project. Member of the urban meteorology research group of Institute for Atmospheric and Earth System Research (INAR).

Research assistant **2017–2020**
University of Helsinki
Work related to high-resolution microscale fluid simulations and aerosol modeling in urban environments.

EDUCATION

M.Sc., meteorology **2019–2020**
University of Helsinki
Master of Science degree in meteorology from the dynamic meteorology and remote sensing specialization track. Master thesis was awarded the highest grade laudatur.

B.Sc., meteorology **2015–2019**
University of Helsinki