Geospatial AI for Urban Analytics (GeoAI4UA) with Actionable Smart Data

Tartu, Tuesday 16 June 2026

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Topic(s) and focus

Cities are becoming smart data ecosystems where earth observation (EO), street-level imagery, mobility traces, volunteered geographic information, and administrative data can be aligned and integrated to understand urban forms and functions at an unprecedented scale. This workshop explores how Geospatial AI (GeoAI) can turn urban data into actionable evidence for planning, transport, public health, equity, and climate resilience, based on advanced data, methods, and models (e.g., foundation-model embeddings, geospatial representation learning, and graph/transformer-based models). Relevant topics could be (but not limited to):

- Multimodal urban data integration (e.g., EO, street-level imagery, trajectories, text, IoT, etc.).
- Urban representation learning (e.g., location-based embeddings) based on graph neural networks, transformers, or multimodal foundation models.
- Benchmarking and evaluation for urban tasks (e.g., transferability, uncertainty, robustness, and domain shift).
- Responsible GeoAI for cities (e.g., bias/fairness, privacy-preserving learning, and governance).
- From models to decisions: explainability, scenario analysis, and decision-support workflows.

Objective(s)

- Provide an up-to-date overview of GeoAI methods that are most impactful for urban analytics, including recent multimodal and foundation-model approaches.
- Equip participants with reproducible workflows for building and evaluating urban GeoAI pipelines using openly available data and open-source tools.
- Discuss methodological pitfalls (e.g., spatial/temporal leakage, confounding, and spurious correlations) and practical strategies for robust evaluation across cities and regions.
- Advance a shared agenda for responsible and trustworthy urban GeoAI, covering bias, privacy, transparency, and stakeholder needs.
- Catalyse collaborations by connecting researchers and practitioners around common datasets, benchmarks, and open challenges.

Planned outcome(s)

- A curated, reproducible 'GeoAI4UA' workshop repository (slides + Jupyter notebooks) enabling participants to replicate the hands-on exercises after the conference.
- A checklist and evaluation protocol for common urban tasks (e.g., land-use/land-cover, building and street network analytics, mobility prediction, deprivation and accessibility modelling) with guidance on uncertainty reporting.

- A draft community document ('Urban GeoAI Playbook: Making Smart Data Actionable') summarising best practices, open datasets, and research gaps; to be finalised after the workshop and shared publicly (e.g., via AGILE channels). This could potentially be shaped as a special issue of an International Journal.
- A lightweight network for continued collaboration (mailing list and optional online follow-up meeting), with the option to develop a short workshop report or position paper depending on community interest.

Workshop format

Half-day workshop:

- Session 1 (approx. 1h): Short invited talks + framing lecture (smart data to actionable urban insights).
- Session 2 (approx. 0.5h): Lightning talks from participants (optional) and problem pitching.
- Session 3 (approx. 1h): Hands-on tutorial - multimodal urban GeoAI pipeline in Python (data ingestion, modelling, evaluation, interpretability).
- Session 4 (approx. 1h): Group exercise and wrap-up - translating model outputs into decision-relevant artefacts; discussion of responsible use and future benchmarks.

Target audience

GIScience and GeoAI researchers, PhD students, and urban analytics practitioners (planning, transport, environment, public health) who want to understand and apply GeoAI methods. Prerequisites: Basic GIS concepts and basic Python proficiency. Participants should bring a laptop; exercises will run locally (conda environment) or via cloud notebooks (e.g., Colab) depending on preference.