Cartography M.Sc.

MSc Thesis TOPIC CHOICES

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Challenges of GeoAI in OSM – Visualizing AI involvement (working title)

is own topic - intended supervisor: Benjamin Herfort (HeiGIT), Georg Gartner

The challenges of GeoAI: visualizing the use of AI in OpenStreetMap.

Advances in GeoAI are impacting open-source, community-driven platforms such as OpenStreetMap (OSM). AI methods are increasingly used to digitise features, automate mapping workflows, extract information and support tagging. Additionally, OSM data is used as input for training AI models. However, the 'black box' nature of many AI systems poses challenges relating to explainability, reproducibility and trust.
In OSM, these issues are further complicated by the lack of consistent mechanisms for identifying and tagging AI-generated or AI-assisted contributions. Consequently, contributors and data users often cannot distinguish between human-generated, AI-generated or AI-assisted data, which limits transparency and the informed use of data.
This research proposes visualizing AI involvement and uncertainty in OSM data to communicate data source and encourage consistent tagging. Building on existing methods for identifying AI-generated features, the research could focus on building and road data, exploring visualization techniques that represent origin uncertainty.
The discussion on OSM can be situated within the broader debate surrounding generative AI and its implications for data quality, as well as the sustainability and resilience of platforms such as OSM.

Starting Literature:

Andorful, F., Herfort, B., Melanda, E. A., Antonio, N. D., Zipf, A., & Camboim, S. P. (2025). Transparency and Trust in Collaborative Mapping: Concerns and Dilemmas in AI-Assisted Road Integration within OpenStreetMap. Annals of the American Association of Geographers, 0(0), 1–22. https://doi.org/10.1080/24694452.2025.2589286

Janowicz, K. (2023). Philosophical foundations of geoai: Exploring sustainability, diversity, and bias in geoai and spatial data science. In Handbook of geospatial artificial intelligence (pp. 26-42). CRC Press.

Fila, M., Štampach, R., & Herfort, B. (2025). AI-generated buildings in OpenStreetMap: Frequency of use and differences from non-AI-generated buildings. International Journal of Digital Earth, 18(1), 2473637. https://doi.org/10.1080/17538947.2025.2473637

Niroshan, L., Carswell, J. D., Niroshan, L., & Carswell, J. D. (2025). Evaluating GeoAI-Generated Data for Maintaining VGI Maps. Land, 14(10). https://doi.org/10.3390/land14101978