

Modeling Human Mobility Behavior with societies of LLM agents

Team Project Spring/Summer 2025
Chair of Data Science in the Economic and Social Sciences

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Understanding Human Mobility Behavior

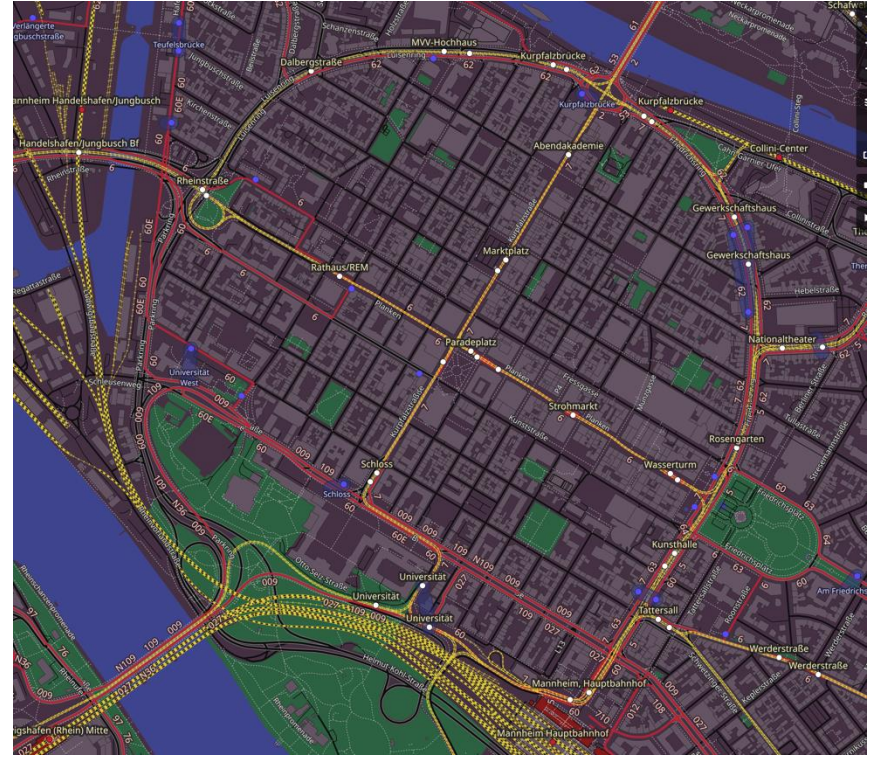
Mapping Human Mobility Flows in Urban Environments

A prerequisite for

- Effective city planning
- efficient public transport
- Congestion studies
- Crowd flow analysis

But data is hard to acquire!

- Lack of real-time information
- Lack of high-resolution demographic information
- Lack of counterfactual data



Research idea

Societies of LLM agents navigating urban environments

Prompting 1000s of LLM agents for movement trajectories:

you are a young student commuter just arriving at mannheim train station, i want to know where in Mannheim *you* are going next. name just one location.

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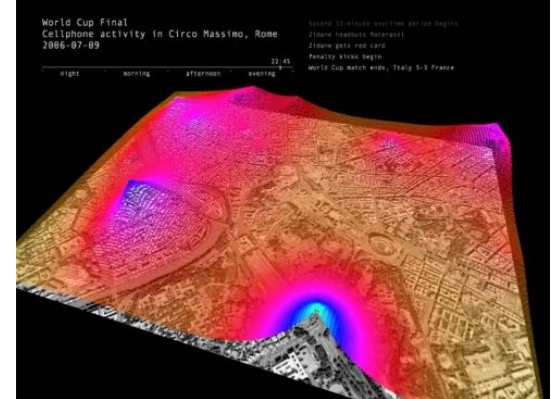
I'm heading to the University of Mannheim next—got a lecture in that beautiful baroque palace.



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Project tasks

- Data collection about mobility behavior
- Define agent population, characteristics and tasks
- Define simulation context and setup
- Run simulations
- Visualizations
- Evaluation and validation of in-silico experiments



References

1. Wu and Wang 2024, Popular LLMs Amplify Race and Gender Disparities in Human Mobility <https://arxiv.org/pdf/2411.14469>
2. Liu et al 2024, Human Mobility Modeling with Limited Information via Large Language Models <https://arxiv.org/abs/2409.17495v1>
3. MobGLM: A Large Language Model for Synthetic Human Mobility Generation <https://dl.acm.org/doi/abs/10.1145/3678717.3691311>