Reproducibility review of: How close is "close"? An analysis of the spatial characteristics of perceived proximity in AirBnB property descriptions using Large Language Models

Daniel Nüst [iD]

2025-06-06

Reviewed paper

Shingleton, J. and Basiri, A.: How close is "close"? An analysis of the spatial characteristics of perceived proximity using Large Language Models, AGILE GIScience Ser., 6, 11, https://doi.org/10.5194/agile-giss-6-11-2025, 2025.

Summary

The reproduction was partially successful. I could not re-run LLM-prompting and fine-tuning due to resource restrictions (time, specific hardware needed) but could run the visualisations and analysis based on the provided intermediate data files, which are all published in an OSF project and well documented. All figures and statistics from the paper were successfully recreated using two provided Jupyter Notebooks using Jupyter Lab with a corresponding runtime environment specification for Python.

Reproducibility reviewer notes

The authors provided a view only link for an OSF repository: https://osf.io/r3ep7/?view_only=b4783a 1d8dcc47109650a7eff0bc662e. The files were downloaded as an archive of ~ 16 MB.

From the Data and Software Availability (DASA) section:

> *This includes the python scripts and LLM prompts used to process the AirBnB listings, the processed testing, training and analysis sets, and two Jupyter notebooks demonstrating the model validation process and the analytical pipeline. A Read-Me file detailing the environment requirements necessary to reproduce the results is also available.*

The `README.md` provides detailed information about the method and computations, including the used computational resources. Since I have no powerful GPU at hand, nor a Huggingface account/key and enough time, I focus on the analysis steps. The main part of the analysis is in the notebook `analysis.ipynb` and therefore will be the focus of this reproducibility review. It should be noted though that the provided `.sh` files seem to make a more extensive reproduction pretty straightforward.

The README lacks the steps to create and use the provided environment configurations and notebooks, but documentation on that is readily available.

```
python -m venv .venv

source .venv/bin/activate

pip install -r osfstorage-archive/analysis_env_requirements.txt
```

Nest step: install notebook environment and run it:

```
pip install jupyter
#No errors, so let's take a look at the notebook.

jupyter lab
```

I open the **analysis notebook** and click on "Restart the kernel and run all cells". This completes in a minute or so. I get a few runtime warnings and deprecation notices, but those do not seem to be critical. I successfully recreates all figures from the paper, most easily identified by the line of code saving it to the results plots directory (`fig.savefig(...pdf')`), see Figures 1 to 6 below.

There are two differences, both of which could be fixed by an update from the authors but are noted here for the sake of completeness:

- ~~Figure 2 is missing.~~ The code chunk is in the notebook, but the figure is not saved to PDF. I added the line `fig.savefig('results/plots/Figure-2.pdf')`.
- ~~Figure 4: the first subplot in the right-hand row is for "Holborn", and not for "Bank" as in the manuscript. I can quickly fix the underlying hexagons to "Bank" by changing the name of the attraction, but I don't know which transit lines should be shown for "Bank".~~

I upload the figures created by my as supporting files to the reproducibility review record.

The **validation notebook** also can be re-run completely. The statistics that are calculated based on the provided evaluation data match the values in the paper: `MICRO METRICS` are shown in Table 1, the error sources are given in Table 2, and further numbers for the post processing fuzzy matching are given on page 6 in the text.
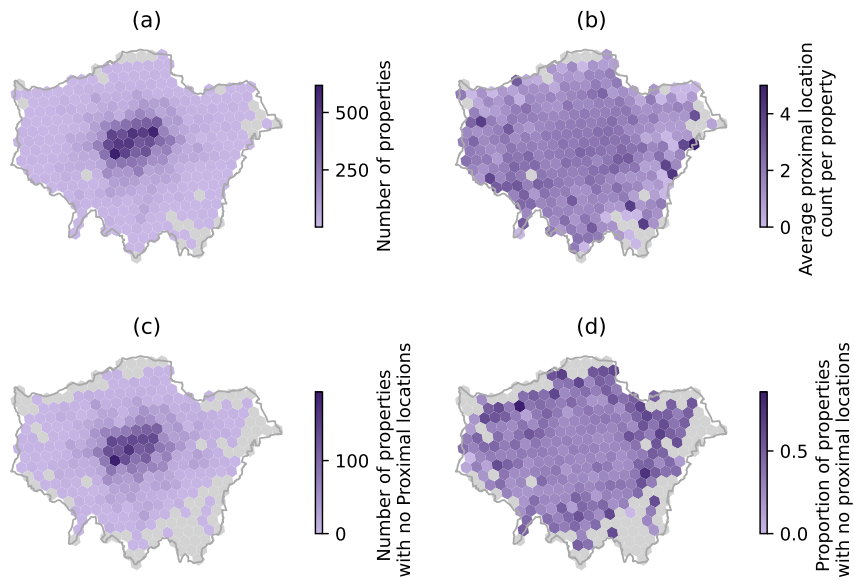
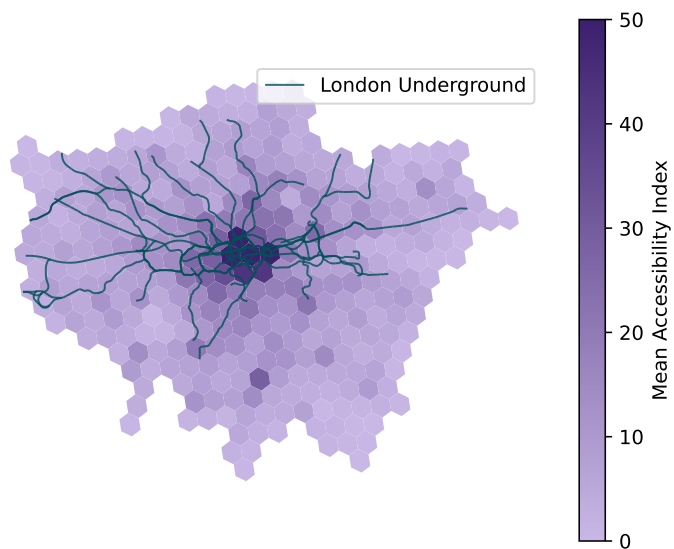Figure 1: Recreation of Figure 1
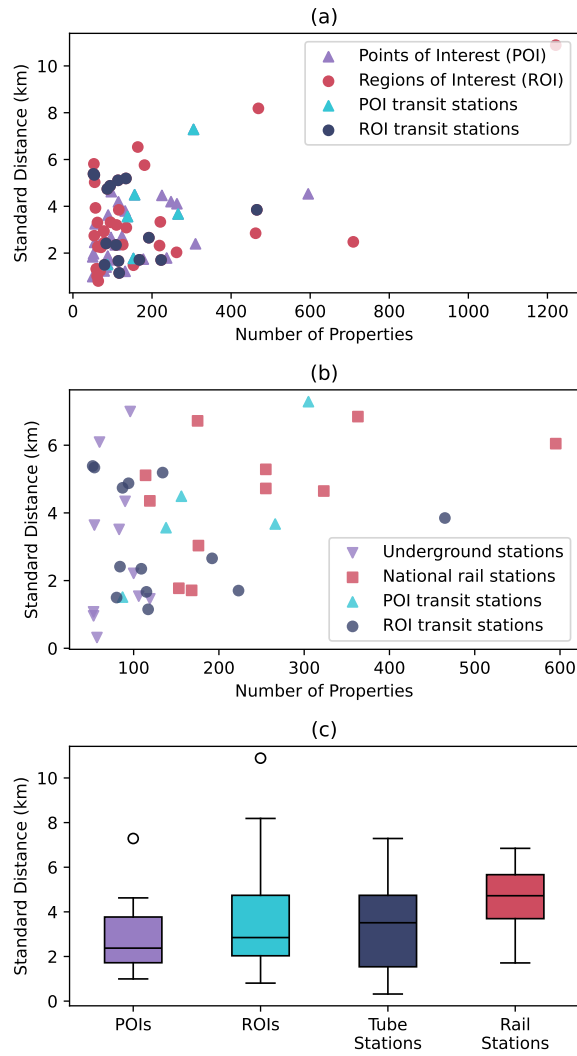

Figure 2: Recreation of Figure 2
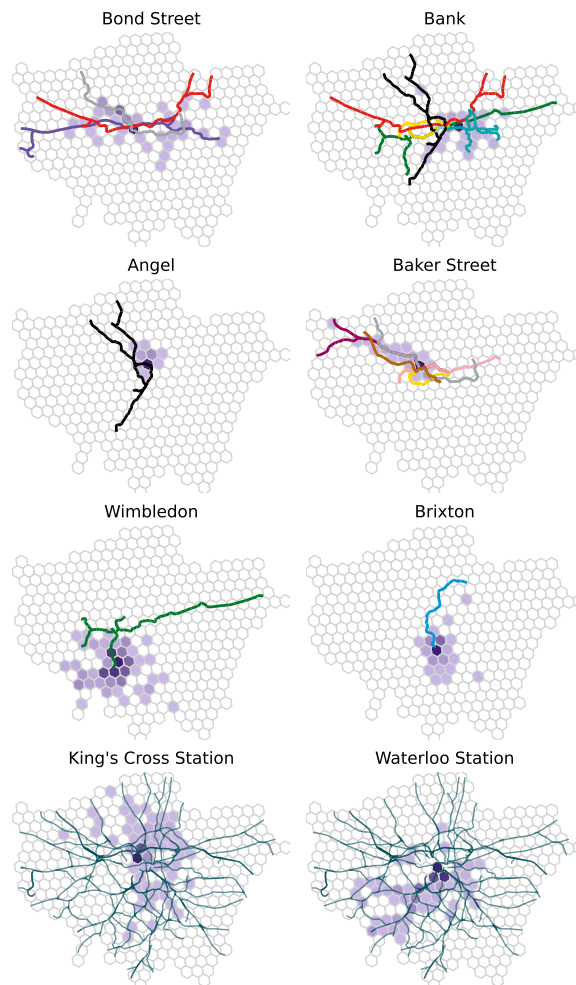
Figure 3: Recreation of Figure 3
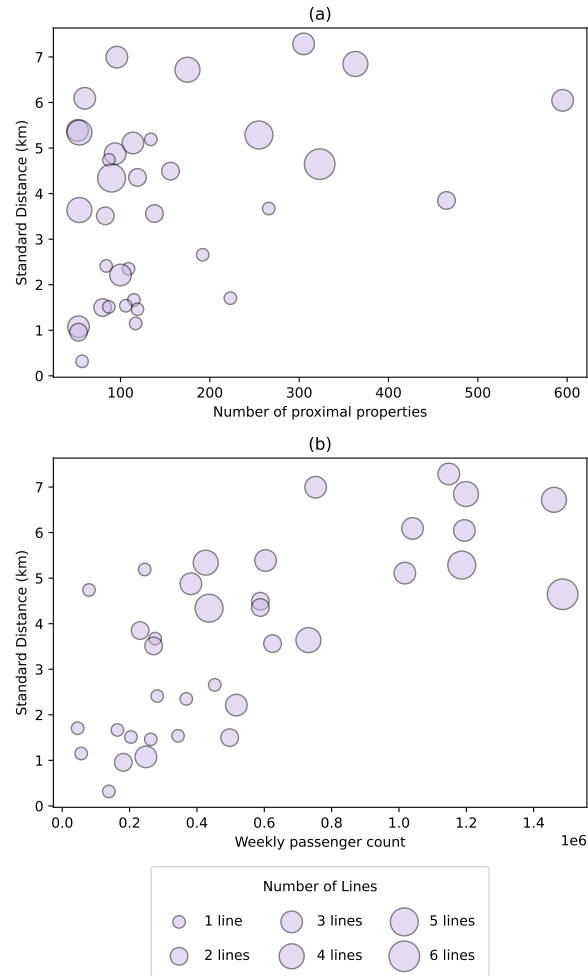
Figure 4: Recreation of Figure 4
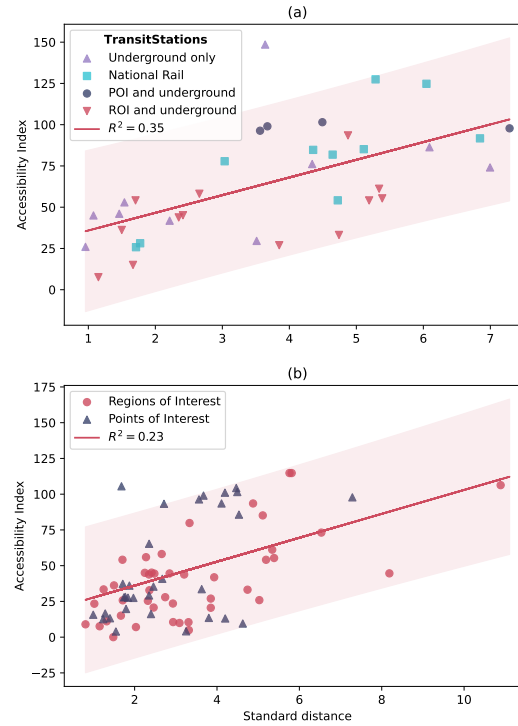
Figure 5: Recreation of Figure 5

Figure 6: Recreation of Figure 6

Recommendations

- Please properly cite your data repository and not just link to it from the DASA section; don't forget to make the repo public and add a proper license file (not just in the README, and in the README, name the license used - MIT, right?)
- Please provide download size estimate in the documentation, e.g., in OSF repository description (one never knows with ML projects if you're waiting for a few MB as in your case or much much more)
- Good job on providing intermediate data sets to allow evaluation without running the whole training again
- It would be helpful if you use headlines in the notebook for the figures matching the numbers in the manuscript; this would also clearly mark additional/explorative plots that are in the notebook but not in the paper