

This is a map of 'Jardin Lecoq' - Analyzing map descriptions from LLMs

Guillaume Touya ^{a*}, Jérémy Kalsron ^a, Laura Wenclik ^a, Quentin Potié ^a

^a LASTIG, Univ Gustave Eiffel, IGN, ENSG, Champs-sur-Marne, F-77420, firstname.lastname@ign.fr

* Corresponding author

Keywords: topographic map, LLM, accessibility, map description

Abstract:

Topographic maps are mines of information, and it may take some time to visually explore them exhaustively. Large language models show a promising potential to analyze and read maps, whether the information is extracted from the legend or directly from the image (Huang et al., 2025). It would be extremely useful if those models were able to replace humans in this tedious task of reading topographic maps. Being able to automatically describe maps would be the first step to make maps accessible for visually impaired people (Kalsron et al., 2022, Robinson and Griffin, 2024), but audio descriptions of maps could also be useful to people with normal vision who keep their phones in their pocket to preserve their visual attention to the space around them.

As a first exploration of this challenge, a simple protocol was adopted. We used an extract from OpenStreetMap at zoom level 17 (Figure 1). This map shows Jardin Lecoq, a park in the center of Clermont-Ferrand, in France. Then, we selected 5 LLM capable of analyzing images: ChatGPT, Gemini, Claude, DeepSeek and Le Chat (French LLM). For each model, the image was attached with the following prompt: "Can you describe the content of this map?". The first answer was recorded without trying to obtain a better one.



Figure 1. Map extract from OpenStreetMap, centred on Jardin Lecoq, a park in the city of Clermont-Ferrand, in France (©OpenStreetMap contributors).

The description provided by ChatGPT is reproduced below with a few changes in the layout to fit the template of this extended abstract better:

"This is a detailed map of Jardin Lecoq, a public park in Clermont-Ferrand, France. The map shows various paths, landmarks, and points of interest within the park, including:

- Major paths and walking trails (red dashed lines)
- Green spaces and wooded areas (shaded in green)
- A pond near the southeastern part of the park
- Notable landmarks and structures such as: "La mémoire des crapauds" (likely a statue or monument), "Tourincot" (possibly a small structure or pavilion), "Tourelle d'angle du château de Bien Assis" (a turret from an old castle), "Théâtre de Verdure" (an outdoor theater), Busts of notable figures like Pierre Alphonse Julien and H. Lecoq.
- Surrounding streets: Avenue Vercingétorix (west), Boulevard Lafayette (north), Cours Sablon (east).

Additionally, the map highlights nearby landmarks outside the park, such as a museum, library, and UCA Campus Centre. The map appears to be based on OpenStreetMap data, providing a useful guide for visitors."

A few comparative metrics have been compiled for those five descriptions (Table 1). For instance, three LLM out of five find the complete localization of the map (Jardin Lecoq in Clermont-Ferrand, France), and Claude does not find the city but provides the name of the park and the country.

LLM	ChatGPT	Gemini	Claude	DeepSeek	Le Chat
# words	177	196	143	200	275
localization	yes	yes	partly	no	yes
# OCR errors	1	0	1	6	0

Table 1. Comparison between the five LLM.

The most notable result is the exhaustive recognition of the toponyms from the map, showing that these models are powerful regarding Optical Character Recognition (OCR). However, OCR with maps is a complex problem and some errors remain, e.g. the carousel "Tournicoti" is recognized as "Tourincot" by ChatGPT and "Totumicon" by DeepSeek. The color contrast around this toponym is particularly complex and only Le Chat recognizes it properly (Gemini ignores it).

These results also show the importance of Retrieval-Augmented Generation (RAG). RAG augments text generation with information retrieved from the web. For instance, the tower ruin located in the park is identified as "a turret from an old castle", which may have been retrieved from Wikipedia, but not from the map. The results also show the ability of LLM to use vision models able to segment the map into objects. Most of the models recognize the blue area in the park as a pond, and the red dashed lines as footpaths.

Even more surprising, the descriptions contain spatial relations such as cardinal directions (Tournicoti is located "at the northeast of the park" according to Le Chat), or proximity relations (the bust is located "close" to the northwest exit of the park according to Le Chat). Some models even describe topological relations that are implicit in the map, e.g. Claude mentions the landmarks located "inside the park", and the roads that "run alongside the park". Claude and ChatGPT are the only models to identify that this map is from OpenStreetMap. Finally, contrary to what we expected, there is almost no hallucination from the models. The only error that can be considered as hallucination is from Le Chat, which describes "rue Blatin, south of the park". The street south of the park is not named in the image, but it is in fact called "Boulevard François Mitterrand".

To go further, we are planning a more thorough experiment involving 15 different maps, described by even more LLM, with a comparison with human outputs. The first results of this experiment will be presented at the workshop.

Acknowledgements

This project received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement No. 101003012, LostInZoom).

References

- Huang, Y., Gao, T., Xu, H., Zhao, Q., Song, Y., Gui, Z., Lv, T., Chen, H., Cui, L., Li, S. and Wei, F., 2025. Peace: Empowering geologic map holistic understanding with mllms.
- Kalsron, J., Favreau, J.-M. and Touya, G., 2022. CrossroadsDescriber – Automatic Textual Description of OpenStreetMap Intersections. In: *AGILE GIScience Series*, Vol. 3, Copernicus Publications, Vilnius, Lithuania, p. 40. Publisher: Copernicus Publications.
- Robinson, A. C. and Griffin, A. L., 2024. Using AI to Generate Accessibility Descriptions for Maps. *Abstracts of the ICA* 7, pp. 1–2. Publisher: Copernicus GmbH.