

The Potential of AI "Maps" with Differences from the Real World to Expand Imagination

Sumire Hamatsu ^{a,*}, Atsuhiro Yamaguchi ^a, Katsutoshi Amano ^a, Juliette Yuzumi Iida ^a, Hidenori Watanabe ^b

^a Graduate School of Interdisciplinary Information Studies, The University of Tokyo,
Sumire Hamatsu - hamatsu-sumire@g.ecc.u-tokyo.ac.jp, Atsuhiro Yamaguchi - yamaguchi-atsuhiro@g.ecc.u-tokyo.ac.jp,
Katsutoshi Amano - amano-katsutoshi@g.ecc.u-tokyo.ac.jp, Juliette Yuzumi Iida - juliette@designlab.ac

^b Interfaculty Initiative in Information Studies, The University of Tokyo,
Hidenori Watanabe - hwtnv@iii.u-tokyo.ac.jp

* Corresponding author

Keywords: AI-generated maps, imagination, art, creative cartography

Abstract:

In cartographic representation, human imagination plays a crucial role in visualizing the entirety of the world and society as a spatial image (Wakabayashi, 2009). Matsuoka (2008) points out that maps expand imagination as a means of recognizing the past and future of regional societies. Additionally, Yoshida (2024) discusses "imaginary maps," stating that while their well-known map designs allow them to be perceived as real, the fact that the depicted places do not actually exist enables the imagination of "otherness." In recent years, AI has gained attention as a tool that evokes human imagination, particularly in fields such as art, literature, and architecture (e.g., Tokui, 2021). Based on this context, this study aims to examine how AI-generated "maps" with differences from the real world, can expand imagination related to places. Because we are familiar with real-world maps, the fictitious elements found in AI-generated "maps" that resemble real-world cartographic forms can, paradoxically, serve to stimulate the imagination.

The methodology is as follows. First, images emulating various map styles were generated using the image-generation AI, Midjourney. Five participants were informed that the maps were AI-generated and depicted non-existent locations. They were then asked to freely compose a brief narrative inspired by the maps (see the list of maps and narratives) followed by a five-minute interview survey about their writing process. For image generation prompts, keywords were primarily selected to specify the type of map (e.g., tourist maps, detailed station area maps, maps drawn by children) and the shapes and colors of key map elements, such as roads, rivers, and buildings. However, no specific geographic information, such as place names, topography, or location data, was input, ensuring that the generated maps depicted non-existent locations. There were no restrictions on word count or writing time for the narrative-writing process. The images used in the study were selected by the author. The interview survey primarily focused on the elements participants paid attention to within the maps and the places and narratives they imagined based on them.

The findings are as follows. An analysis of the narratives created by five participants based on the AI-generated maps, along with their interview responses, revealed that their recognition of differences from the real world could be categorized into three patterns: (a) perceiving no differences from the real world and interpreting the map as if it were a real one; (b) Noticing differences from the real world but not incorporating them into the narrative; and (c) Integrating imagined elements derived from the perceived differences into the narrative.

First, an example of category a is presented. Viewer 1 imagines a foreign city from the map (Figure 1). As she wrote in their narrative, *"Even without closely examining the text on the map, I get that impression,"* it indicates that she formed an image of the place without verifying whether the "text-like elements" were actual characters. Furthermore, when considering the overall design, she mentioned that it reminded them of an umbrella she had purchased, which had a map of New York printed on it, demonstrating how the map evoked the image of a real-world location. Next, an example of category b is presented. Viewer 2 interpreted the map (Figure 2) as resembling a map of New York. She attributed this to the vibrant colors of the map and the concentration of most buildings in the center, which evoked the image of a lively, bustling metropolis. Additionally, although she noticed some inconsistencies in the map, she stated that she unconsciously adjusted those inconsistencies by referencing real-world maps she had encountered, thereby reducing their sense of unfamiliarity. As a result, she constructed a narrative about New York as a real city. Finally, an example of category c is presented. Viewer 3 interpreted the map (Figure 3) as depicting the history of the fictional city of "Doari". Her narrative described how *"the central island (an area surrounded by a river) contained a rare underground resource called 'Q Ore,'"* but *"due to the impact of the 421 Incident, resource development was halted, and bridge construction was*

immediately suspended." She specifically noted that her inspiration for imagining the suspension of resource development came from the interruption of bridge-like structures within the map, which she found unusual.

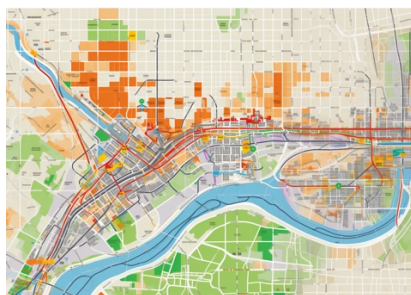


Figure 1. AI generated Map (by Midjourney)

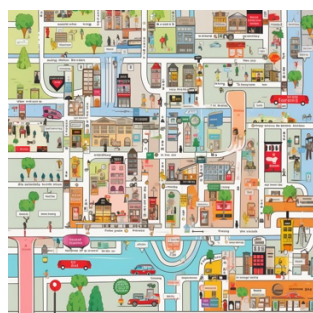


Figure 2. AI generated Map (by Midjourney)



Figure 3. AI generated Map (by Midjourney)

Based on these findings, in cases (a) and (b), the perceived authenticity of AI-generated maps either facilitated the process of imagining a narrative or, at the very least, did not hinder it. In contrast, in case (c), the differences from the real world served as a trigger for expanding imagination. This confirms that AI "maps" have the potential to enhance imagination related to places. In this experiment, AI-generated maps primarily created in 2023 were used, which holds significant value when considering comparisons with the latest generative AI models capable of producing even more refined images. When maps are generated using the latest AI models, their increased perceived authenticity may further heighten the risk of misinformation. In addition to observing the latest developments in generative AI, in future work, I also aim to examine how people's experiences and knowledge related to place function as factors that drive imagination.

References

- Matsuoka, K., 2008. Maps which Connect Individuals and Society: The Possibility of Geographical Imagination in Contemporary Society. , *Kansai Sociological Review*, Kansai, Japan, Vol. 7, pp. 100–113.
- Tokui, N., 2021. *Creating with AI—A Never-ending Stories on Machines and Human Creativity*. Tokyo, Japan: BNN.
- Wakabayashi, M., 2009. *Chizu no sōzōryoku [The Imagination of Maps]*. Tokyo, Japan: Kawade Shobo Shinsha.
- Yoshida, M., 2024. Imagination evoked by imaginary maps: Research on the characteristics of maps as a medium for expressing creativity. In: *Proc., 71st Annual Conference of the Japanese Society for the Science of Design*, June 21–23, 2024, Kyushu, Japan, pp. 320–321.