From Route Descriptions to Route Conversations: The Next Evolution of CUI Interactions for Navigation

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Abstract

Conversational user interfaces (CUIs) have become a critical component of modern mobile navigation, featuring spoken turn-by-turn instructions. As CUIs continue to proliferate and machine-generated language improves, we expect a shift in how navigation instructions are crafted. In this position paper, we explore the concept of "route conversations". In contrast to traditional route instructions, route conversations are accompanying dialogues between CUIs and humans reminiscent of human-human chats. We envision a first prototype of a CUI capable of engaging in route conversation and discuss its implications. Through vivid conversations throughout the navigation, we aim to increase trust in the system by enabling users to discuss timely information. Additionally, this approach should improve users' perception of the surrounding environment by actively referencing navigational features during the conversation.

Author Keywords

Route Conversations; Conversaiontal User Interface; Navigation; ChatGPT of Oz

CCS Concepts

•Human-centered computing → Human computer interaction (HCI); Natural language interfaces;

Route Conversations

Conversational user interfaces (CUIs) have become an essential technology in modern navigation, providing means of asking for and receiving navigation instructions. These instructions are often communicated turn-by-turn, meaning that minimal information like “turn left in 200 meters” is provided by the CUI before or at each decision point. While this approach is efficient and functional and has been used for almost two decades, researchers agree that this is not how humans describe routes to one another [4]. Consequently, navigation is a field where CUIs are still lacking in the conversational part, as most applications dictate steps sequentially.

Generating natural sounding route descriptions has been an ongoing challenge in research [3, 4]. Shortest path algorithms have been able to calculate paths for navigation between an origin and a destination for multiple decades. During this time, the most common method to communicate these routes has become turn-by-turn (TBT). TBT navigation instructs a person with the appropriate navigation action in sequential steps.This behaviour has shaped how people interact with CUIs by having been accustomed to receiving unexciting directives with little room for alternatives or further information. Research finds that route descriptions can be more meaningful and helpful when enriched with orientation information as they conform to how humans structure wayfinding instructions [1].

In this paper, we explore a novel concept of “route conversations”. Route conversations are vivid dialogues between CUIs and humans about a route before, during, and after navigation. The system’s routes are natural sounding and include landmarks and context information beyond the standard turn-based information to offer users deeper insights about the environment for an engaging experience.

Machine-generated natural language has the potential to transform the way we generate navigation instructions by leveraging vast amounts of data to create more human-sounding and context-aware descriptions [10]. This can improve the overall user experience and reduce errors, making navigation more engaging and enjoyable. With its recent release, ChatGPT [8] is able to provide route descriptions in human-like language. While it is not able to calculate a new route from an origin to a destination, it is able to output a natural sounding route description if given an objective description of the route. Thus, current developments in machine-generated route descriptions will allow for more flexible interaction with CUIs.

Prototype

For a first prototype, we use a method we call ChatGPT of Oz, where we take advantage of ChatGPT to emulate a CUI capable of engaging in route conversations. We use a detailed description of the behaviour of our envisioned system and instruct ChatGPT to emulate this system. This “initialisation” allows us to engage in a text-based navigation simulation where we are able to talk to the system about relevant spatial information (see Figure 1).

Inclusiveness of Route Conversations

Route conversations have the potential to enable various groups to receive better navigational aids. The technological capability to offer additional information in specific situations can help people with intellectual disabilities to navigate complicated situations better [2, 9] by maintaining a natural conversation. Such an interface would also allow for completely hands-free interaction during a navigation task [7], allowing people with mobility impairments to interact with navigational technologies more naturally [9]. By delving into different use cases and scenarios, we aim to begin the discourse of this emerging field and stimulate

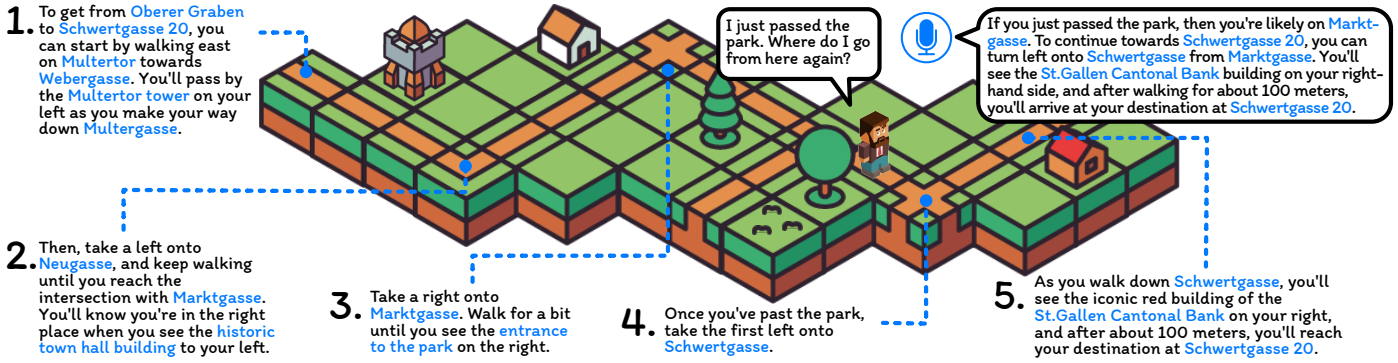

Figure 1: This image depicts an example for a route conversation created with the our ChatGPT of Oz based prototype. The five paragraphs show the complete route instruction which is given before embarking on the navigation task. During the navigation the user can ask about the next or previous steps given their current location by referencing points of interest among other relevant details about the route.

discussions and explorations of this promising technology. Ultimately, our goal is to highlight the potential of machine-generated text to transform how we interact with CUIs during navigation, making it a more seamless and enjoyable experience for all users.

Implications & Conclusion

To reach their destinations, traditional route instructions have been serving humans well during the past decades. With route conversations, these one-sided instructions can be turned into a dialogue which will benefit peoples' navigation abilities as much as their user experience with navigational CUIs [5]. Our ChatGPT of Oz prototype illustrates the potential of route conversations. However, the platform has limitations. Since ChatGPT does not have actual geographical information, it creates made-up landmarks and context information. Open challenges for route conversations, therefore, include combining such language models with existing geographical databases. Once implemented, the use-cases for route conversations are manifold. CUIs equipped with this capability can act as personal tour guides [6], empower users with disabilities to navigate their surroundings more securely [9], or actively help people to get familiarised with new neighbourhoods [1].

In summary, current language models such as ChatGPT offer solutions for challenges to generate natural sounding route instructions. While technical limitations prevail regarding the factual correctness of spatial contexts, our setup showcases a novel solution to change how we could engage with navigational interfaces in the future.

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