CS599 – Natural Language Dialogue Systems – Project Report

Giving Route Instructions in Uncertain Virtual Environments (GRUVE)

The project aims to build a Natural Language Generation module that operates as a part of the bigger dialogue system that assists a user navigating through the streets of a city on Google Streetview. The challenge here is to generate instructions in the context of uncertain user positioning information and to adapt them to a user's experience in the neighborhood.

The dialogue system will receive navigation requests from the user. It then calculates the shortest path to the destination and presents navigation instructions as the user walks around. The NLG module uses the route plan, city model and user model to access information about the street layout, entities on the streets and user's experience in the neighborhood.

The following are the challenges that the project aims to accomplish:

1. Generating navigation instructions: Given the user location and goal (i.e. a destination street name), the system should generate navigation instructions for the user. Our dialogue manager module will present your NLG module with the route plan for the user to get to the destination from their current location at every decision point (e.g. street junction). The NLG module will be required to convert this route plan into natural language instructions.

2. Uncertainty in user location: User location reported in terms of his/her latitude and longitude may be erroneous. The uncertainty will be passed to the NLG module by the dialog manager module in terms of accuracy metric (with range of 1 to 50 meters). In the face of uncertainty, the challenge for the NLG module is to generate more robust instructions that users can use even if their locations are uncertain.

3. Modeling the user's spatial knowledge: If users return to play the same game or some other game in the same geographic region, NLG modules could take that into account and generate instructions that are adapted to the user's knowledge of the neighborhood. Each user will be uniquely identified, and the NLG module will be able to query the user's past navigation experience in the neighborhood from the user model as recorded by the dialogue manager. This information can be used to adapt the instruction generated to the user's navigation traces.

Implementation: The project will be implemented on a web-based environment, with a game scenario where the user's task is to assist a pirate to find a treasure in the streets of Edinburg. The dialogue system is available to the user and is called user buddy with which the user will interact using buttons and a textbox interface.