Information Navigation via Spoken Dialogue and Linked Data

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1 Demo Description

Please describe how the demo works and what is novel about the demo compared to the state-of-the-art. (Up to 500 words)

Spoken Dialogue Systems (SDS) is a thriving research area with many commercial applications, such as intelligent personal assistants, e.g. Microsofts Cortana, Apples Siri, and Amazons Echo among others. However, currently deployed systems are usually: i) statistical on small domains; or ii) hand-crafted on large/open domains, mostly offering Question-Answering (QA), rather than a natural conversation.

In our demo, we will show an architecture that combines the benefits of SDS and QA, and allows users to explore the information space and retrieve meaningful information by conversing with the system. We achieve this by taking advantage of Linked-Data, Semantic Web, and Information Retrieval technologies. Moreover, we allow users to be more expressive in their utterances by introducing a number of operators (less than, between, around, and, or, not etc.), by implementing preferences as well as hard constraints, by allowing slots to take hierarchical values, allowing values to be expressed as combinations of intervals, and by allowing certain slots to take multiple values (e.g. hotel amenities). Our Linked-Data SDS (LD-SDS) can then fetch items from available open Linked-Data sources and support advanced exploratory and query services that will help users better understand their own goals and criteria, which are not always explicit and predefined.

During the demo, our system (a Hotel Concierge SDS) will connect to Hippalus [1] [2], a system that supports preference-enriched faceted search in real time, feeded with web content regarding Japanese hotels, museums, restaurants, and shopping centres (the ultimate objective is to widen the scope of data by exploiting the global-scale semantic services provided by LODsyndesis [1]). We will be showing system and user utterances, parts of the belief state (due to space restrictions) as well as grouped and ranked results from Hippalus. All of these will be updating in real-time, as we interact with the dialogue system.

Specifically, users can ask our Hotel Concierge to provide them with options regarding museums, restaurants, and shopping centres so that they can plan

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[1] http://www.ics.forth.gr/isl/Hippalus

a day somewhere in Japan. During the interaction, the system will take note of users' preferences and constraints, and will filter, group, and rank available options. To help them navigate the information space, the system will at times make suggestions about items' attributes (e.g. 'Is location more important for you than price?' or 'Would you prefer an expensive restaurant?') and present the available options (e.g. 'There are four restaurants that match your criteria, two that serve traditional Japanese food, one that serves Chinese, and one that specializes in barbecue'). As the interaction progresses, we can pause to explain the process under the hood and help the audience understand how our pipeline works.

2 Demo Requirements

Please describe space and equipment requirements for the demo.

We can support unscripted input to some extent, so long as it is in-domain e.g. about hotels, restaurants, museums, or shopping centres in Japan. For the purposes of demonstrating our system (described in more detail in [3]), we will bring our own laptop and microphone, but would require a projector with high resolution if the demo is shown to many participants otherwise a large screen (HD TV), connection to a power outlet, and access to the internet. The set-up time should be about 15 minutes.

References

1. Mountantonakis, M., Tzitzikas, Y.: On measuring the lattice of commonalities among several linked datasets. Proceedings of the VLDB Endowment 9(12) (2016)
2. Papadakos, P., Tzitzikas, Y.: Hippalus: Preference-enriched faceted exploration. In: EDBT-ICDT Workshops. vol. 172 (2014)
3. Papangelis, A., Papadakos, P., Kotti, M., Stylianou, Y., Tzitzikas, Y., Plexousakis, D.: Ld-sds: Towards an expressive spoken dialogue system based on linked-data (2017)