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1 Research Interests

Within the domain of Spoken Dialogue Systems my main research interests lie in **dialogue management**, including developing better solutions for **context dependency**, as well as research related to **Automatic Speech Recognition** systems, and their overall effect on spoken dialogue system functionality. I also have an interest in how dialogue systems can be used to assist in education, specifically language learning.

1.1 Overview of Previous Work

My work in this field has consisted primarily of research related to the development of the dialogue system for the USC Institute for Creative Technology's New Dimensions in Testimony project. This project seeks to preserve the testimony of Holocaust survivors so that future generations may have interactive, real-time conversations with them in a process known as "Time-Offset Interaction." Unlike many dialogue systems which use synthesized voices or text-based responses, this system utilizes actual audio/video recordings of real holocaust survivors.

My initial involvement on this project took place during my undergraduate internship in 2014, during which time it was our goal to discern how many utterances must be recorded in order to support this type of dialogue system. This exact question is the focus of a research paper which I helped author (cf Artstein et al. 2014). The system I helped develop during that time is currently deployed in the Illinois Holocaust Museum and Education Center, as well as the National Holocaust Museum in Washington DC.

This summer (2016) I helped direct a team of interns which conducted data collection for the development of 3 more such systems with 3 new Holocaust survivors. I was also much more involved not only in data collection research, but also in other capacities related to the functionality of the dialogue system itself. I am currently finishing up my internship here at ICT by working with another intern to author a new dialogue policy that would add some context dependency to the system, a feature that is all but absent in the prototype system developed 2 years ago.

2 Future of Spoken Dialog Research

As dialogue systems become more ubiquitous in our daily lives I believe that the field of dialogue research will only continue to proliferate. It is my belief that a multitude of tasks we currently carry out manually will be carried out by interacting with dialogue systems in the future. One such task is word processing. Speech-to-text technology is improving every day, but when you consider all the possible tasks within the realm of word processing it is evident that simple STT translation engines will not be enough for the word processing systems of the future. A fully developed dialogue system would be necessary to accomplish the full battery of tasks associated with word processing such as typographical stylistics, the addition of graphics and charts, and so on.

In the next 5 to 10 years I believe that spoken dialogue systems will come to replace many of the ways in which we interact with technology manually, including word processing, but also in many other situations where we are required to type commands or manually press buttons in order to utilize technology. Just today I watched a presentation by a PhD student here at ICT who helped develop a fledgling dialogue system designed to assist in photo editing. Likewise an intern here this summer developed a dialogue system for a mobile application designed to educate and advise users about the use of sunblock.

It seems, therefore, that one cannot envision the future of technological advancement without the use of dialogue systems to interact with said technology. However, there is clearly a need for more research before we get to this point, specifically I believe in the realm of ASR, because the efficacy of these types of dialogue systems depends so much on properly identifying human utterances.

3 Suggestions for discussion

As it is one of my primary research interests, the topic I would most like to see discussed at the round table is the practical applications of dialogue systems in education and academia. I am greatly interested in how we can design dialogue systems not just to help people accomplish tasks, but also to facilitate education on a wide variety of topics. One of the interns here at ICT this summer was working on just such a dialogue system, designed to help Spanish speakers learn English, and I feel that this is an area of research within the field of dialogue systems that is only just starting to garner attention in the research community.

In addition, and again because it is of primary concern to me, I think a discussion of context dependency within spoken dialogue systems is warranted. I feel that this is a frequently overlooked aspect of dialogue system creation at this point in the evolution of the field, and many of the dialogue systems I've interacted with have a long way to go to be able to properly handle context dependent utterances.

Lastly, I would be very interested in a discussion of how paralinguistic and extralinguistic information could be communicated in spoken dialogue systems, perhaps using virtual humans, but perhaps using a combination of spoken and text based dialogue systems to represent this information. Although I realize this roundtable is specifically about spoken dialogue systems, I also believe that the phenomenon of text-based-dialogue has evolved to such a point as to render it very close to the communicative capacity of spoken dialogue. Therefore, I feel it is not altogether inappropriate to include semiotics as part of a larger discussion about spoken dialogue systems.

References

Ron Artstein, Anton Leusk, Heather Maio, Tomer Mor-Barak, Carla Gordon and David Traum. 2014. *How many utterances are needed to support Time Offset interaction?* Published in the proceedings for the 28th International Florida Artificial Intelligence Research Society Conference.

Biographical Sketch

Carla Gordon is a Linguist by trade (B.A. Linguistics, CSULB 2015), originally interested in phonology and Pronunciation teaching methodology, who has now shifted her research interests to the computational end of the spectrum (M.A. Linguistics with a Special Concentration in Computer Science, CSULB 2018). She has twice interned at the USC Institute for Creative Technologies, (2014, 2016) where she was involved in research pertaining to dialogue system creation the New Dimensions in Testimony project. She will now be joining the ICT staff as a student researcher to continue her contributions to this project..

Outside the realm of dialogue systems, she retains her passion for phonology and pronunciation and has plans to create a new and unique pronunciation teaching application for those who have difficulty distinguishing speech sounds. In her free time (of which there is very little) she enjoys singing and playing guitar, and manages a Youtube channel where she periodically uploads videos of cover songs and the occasional original.

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