IJCoL

Italian Journal of Computational Linguistics

7-1, 2 | 2021

Special Issue: Computational Dialogue Modelling: The Role of Pragmatics and Common Ground in Interaction

Discussion points raised by Francesco Cutugno and Maria Di Maro

Francesco Cutugno and Maria Di Maro

Electronic version

URL: <https://journals.openedition.org/ijcol/809>

DOI: 10.4000/ijcol.809

ISSN: 2499-4553

Publisher

Accademia University Press

Printed version

Number of pages: 27-28

Electronic reference

Francesco Cutugno and Maria Di Maro, "Discussion points raised by Francesco Cutugno and Maria Di Maro", *IJCoL* [Online], 7-1, 2 | 2021, Online since 01 December 2021, connection on 26 December 2021.
URL: <http://journals.openedition.org/ijcol/809> ; DOI: <https://doi.org/10.4000/ijcol.809>

IJCoL is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License

Knowledge Modelling for Establishment of Common Ground in Dialogue Systems

Discussion points raised by
Francesco Cutugno
and Maria Di Maro

The paper deals with the process of grounding in dialogue systems, modelled in terms of factual knowledge of the world, knowledge concerning the user, and the hypothesis of mental knowledge state of the user, i.e., theory of mind. The difficulty of describing and modelling this pragmatic process in conversational agents emerges here in the necessity to refer to and integrate other cognitive theories. Specifically, considering that there are diverse types of shared sets of knowledge, the question that can be addressed refers to their possible different modelling strategy. More in detail, how can they be differently modelled according to their functions? As these sets of knowledge can be partially represented as different aspects of the Common Ground (GC) (Clark 2020), it would be worth exploring how they also interact with one another to successfully communicate. The processes described in the paper, which reflect the state-of-the-art, point out how the success of such grounding applications requires a consistent number of interactions or dialogue turns to efficiently ground information to be used to personalise a dialogue or to infer user's mental states. In this sense, corpus-based training processes, with or without probability-based methods, could be considered as a good starting point. Citing the author's abstract, "[...] this article provides a basic overview of current research on knowledge modelling for the establishment of common ground (henceforth CG) in dialogue systems." The overview is by far more than "basic" and covers a wide range of issues related to CG deepening how to integrate three types of knowledge (i.e., factual, personalised, and beliefs about user knowledge) into any form of automatic system able to manage with task oriented (and not only with them) dialogues. Even if it is not clearly noted in the paper, the introduction of a module able to introduce and represent CG in the general architecture of an automatic dialogue system manager, needs to be strictly "synchronised" with another fundamental module in the architecture: the Dialogue State Tracker (henceforth DST), which, in the recent literature, is more and more becoming the real "pulsing hearth" of these systems. Provided that DST systems have been deeply transformed by the application of Deep Neural Networks, contextual (in a very wide sense) embeddings, inexplicable procedures whose details we all are trying to explain, it could be worth exploring how this is reflected into CG module design. In other words, provided that automatic CG representation processes are called to interact with DST at any time, it is interesting to know what the authors' vision is on the evolution of CG technologies faced to DST systems affected by a high level of complexity. More specifically, under which constraints is it imaginable that also CG technologies can go "into deep"? Natural dialogues, both task oriented and general, have a temporal dynamic. Dialogue state evolves with time and so CG does. We have found very few literature references on evolving systems, able, for example, to find inconsistencies, or re-align dialogue states along with the dialogic situations

that can appear during interaction. CG and knowledge representation can be thought “static” and encyclopaedic but some pointer, indexes, should be active and varying with time, or better, with turns advancements. What is authors’ idea on this matter? In conclusion, it appears almost clear that in the next future, online learning techniques will be introduced more and more pervasively into dialogue systems. Again, temporal evolution awareness and state tracking will take an advantage by this injection. But what about CG? And how Deep Neural Network and online learning will be integrated?

References

Clark, Herbert H. 2020. Common ground. *The International Encyclopedia of Linguistic Anthropology*, pages 1–5.