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Title

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Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 35(35)

ISSN

1069-7977

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Publication Date

2013

Peer reviewed

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University of California

Mental Model Ascription by Language-Enabled Intelligent Agents

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Topic and Goal

Mental model ascription can be defined as inferring features of another human or artificial agent that cannot be directly observed, such as that agent's beliefs, plans, goals, intentions, personality traits, mental and emotional states, and knowledge about the world. This capability is an essential functionality of intelligent agents if they are to engage in sophisticated collaborations with people. The computational modeling of mental model ascription offers an excellent opportunity to explore the interaction of traditionally separate modules of cognitive architectures, such as language understanding, plan- and goal-oriented reasoning, and memory management.

The study of mental model ascription can benefit from advances in fields as disparate as machine reasoning, social interaction, developmental psychology, robotics, emotion, philosophy and computational linguistics, to name just a few.[1] The common thread of this workshop will be the *computational modeling* of unobservable features by intelligent agents using *language input* as at least one of their modes of perception. Topics of interest include but are not limited to:

1. Developing computational treatments of language phenomena (e.g., indirect speech acts, irony, paraphrase, humor, coercion) that require or give rise to mental model ascription.
2. Applying computational models of other cognitive capabilities (dialog, emotion, agent collaboration/competition and plan- and goal-oriented reasoning) to mental model ascription.
3. Modeling agent decisions about what to learn about other agents' unobservable features, considering that attempting to learn everything in every context would incur a heavy cognitive load.
4. Modeling how agents measure their confidence in the results of mental model ascription, which will be affected by their confidence in their understanding of contributing linguistic (or other) percepts as well as their ability to make valid inferences.
5. Modeling dynamic belief modification, including overriding a previous belief and managing memories with respect to modified beliefs.

The main goal of the workshop is to foster mutual learning, discussion and future collaboration among researchers pursuing agent-oriented mental model ascription in integrative cognitive architectures.

Program Committee (confirmed)

Ron **Artstein** (USC)
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Massimo **Poesio** (University of Essex)
Chris **Potts** (Stanford University)
Yorick **Wilks** (IHMC).

Organizational

This will be a full day workshop that will include invited talks, talks selected by abstract submission, a round table discussion, and, optionally, a poster session. Talks will be grouped by similarity of theme and approach, and the schedule will allow for extended discussion of each group of presentations, best exploiting the workshop genre.

We expect 30-40 participants that include students and researchers with broad interests in the computational modeling of cognition and/or psychologically-inspired natural language processing.

The final session of the day will be devoted to planning a special journal issue (for *Advances in Cognitive Systems*) of papers inspired by the workshop. There are no special requirements for participants in the workshop.

The workshop website is http://ilit.umbc.edu/Workshop/MentalModelCogSci2013.html. The contact email is mentalmodel2013@gmail.com.

The workshop organizer, Marjorie McShane, has been working in the field of AI-NLP for the past fifteen years, with recent work focusing on the development of cognitive simulations of virtual patients to support clinician training. For a brief CV and list of publications, see http://ilit.umbc.edu/PubMcShane.htm.

[1] As a comparison, CogSci 2012 featured a workshop, "Modeling the Perception of Intention" that treated intention recognition with an emphasis on visual perception.