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Authors

Dirffner, Georg

Prem, Eich

Gasser, Michael

et al.

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SYMPOSIUM

Grounding, Situatedness, and Meaning

- Organizers: Georg Dorffner and Erich Prem, University of Vienna
Michael Gasser, Indiana University
Stevan Harnad, Princeton University
- Other participants: Rodney Brooks, Massachusetts Institute of Technology
Morten Christiansen and Nick Chater, University of Edinburgh
George Lakoff, University of California, Berkeley
David Touretzky, Carnegie Mellon University

Abstract

This symposium is concerned with the notions of *grounding* and *situatedness* and their relevance to cognitive theories in general, and to theories of meaning in particular. *Grounding* is to be understood as the linking of system-internal objects (such as symbols or concepts) with the external objects they are about, through the system's sensorimotor interaction with them. *Situatedness* is to be understood as the immediate coupling of the system's actions with its environment.

The discussion will be organized around the following questions:

1. How much does the concept of grounding contribute to theories of meaning?
2. Is grounding important for understanding natural cognitive systems and/or for designing artificial ones?
3. Is it possible to accommodate different notions of grounding (e.g., Harnad's and Brooks's senses) in a unified framework?
4. What is needed to extend current models of grounding so that they go beyond simple word semantics?
5. Should grounding be inextricably tied to situatedness? Is the notion of representation incompatible with the sort of dynamical system that seems to be called for in a situated model of cognition?

The participants cover a wide range of views on these issues. Touretzky and Christiansen & Chater challenge the usefulness of the symbol grounding idea. Touretzky argues that the grounding of symbols in perception has

little to say about what should be of most interest to cognitive scientists: how conceptual structures are constructed out of symbols. Christiansen and Chater consider the contributions of the notion of symbol grounding and of philosophical theories of meaning to each other. Their position is that the former has more to learn from the latter than vice versa.

The other speakers come out on the side of one or another sort of grounding approach but disagree on whether symbols as such are necessary and on the promise of connectionist approaches to grounding. Harnad argues that symbol grounding is indeed a problem and among several candidate approaches he advocates a hybrid analog/connectionist/symbolic one because connectionism alone does not seem to be able to do the job. Brooks proposes an engineering approach to grounding: build a system based on some notion of physical grounding and see how much further it can be taken than existing systems based on the Physical Symbol System hypothesis. Lakoff argues that recent work on the grounding of spatial predicates by Terry Regier provides the foundations for grounded concepts without symbols. Dorffner and Prem make the case that a radical form of connectionism can address both grounding and situatedness and that grounded symbols, while not required for intelligent behavior, can enhance the performance of autonomous agents. Gasser argues that alongside the problem of grounding atomic symbols, there is the problem of grounding the structure of concepts, which cannot be handled by a symbol system alone.