Situations and AI: Guest Editor's Introduction

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In 1982 Daniel Dennett wrote a "Correspondent's Report" for *Artificial Intelligence.* In this brief but visionary review, he enumerated some influential works representing (analytic) philosophy's contributions to AI. Dennett's following remark was especially interesting (Dennett, 1982, p. 3):

> Some philosophers have written about AI directly, and some have written about topics that people in AI are, or ought to be, interested in. I will usually concentrate on the *latter* variety both because it is less likely to come to your attention on its own, and because it is generally *better* work. [my italics]

A good, provocative piece of such philosophical work was, according to Dennett, *situation theory*, and he devoted part of his report to a quick explanation of it and related research efforts.

In this special issue of *Minds and Machines* I want to renew the spirit of Dennett's above quote and take a close look at recent situation-theoretic research which has mostly originated within a philosophical framework but promises to have strong connotations for AI workers.

Situation theory (ST) is an attempt to develop a theory of meaning which will clarify some tough problems in the study of logic, language, information, and the mind. It was first formulated in detail in an elegant monograph (Barwise and Perry, 1983) and has matured over the last decade or so (Barwise, 1989; Devlin, 1991; Barwise and Seligman, 1997). Various versions of ST have been applied to a number of linguistic issues, resulting in what is commonly known as *situation semantics* (SS). SS aims at the construction of a unified theory of meaning, with applications to natural language (Gawron and Peters, 1990).

Philosophical and logical issues that arise within situation theory and situation semantics (STASS) have been explored in numerous papers; see excellent conference proceedings dedicated to STASS, such as (Cooper et al., 1990; Barwise et al., 1991; Aczel et al., 1993; Seligman and Westerståhl, 1996), and a monograph (Barwise and Etchemendy, 1987). While such contributions occasionally touch on issues that are clearly relevant to AI, overall there is a lack of convincing proofs or case studies substantiating why situations are crucial for AI.[1]

The seven papers which make up this special issue further demonstrate the advantages of the situation-based approach towards problems with a definite AI flavor. They are as follows:

1. N. Braisby, "Compositionality and the modelling of complex concepts"
2. L. Cavedon, "Default reasoning as situated monotonic inference"
3. C. Gurr, J. Lee, and K. Stenning, "Theories of diagrammatic reasoning: Distinguishing component problems"
4. R. C. Koons, "Teleology as higher-order causation: A situation-theoretic account"
5. C. Menzel, "The objective conception of context and its logic"
6. H. Nakashima, "AI as complex information processing"
7. S. Tojo, "Event, state, and process in arrow logic"

Although the authors treat diverse issues, the unifying characteristic of their papers remains the same: heavy emphasis on STASS ideas or philosophy, in general. Each paper gives us insight into the way how the employment of the common notion of "situation" enriches and provides a powerful handle to a particular AI problem; it demonstrates why this notion plays a very useful—even essential—role in certain areas of AI.[2]

While putting together this special issue, I have learned a lot from the contributors. I have also had the good fortune of depending on the excellent advice of Jim Fetzer, Editor-in-Chief. The outcome of this process is hopefully something useful and of lasting value, and I look forward to hearing from the readers of *Minds and Machines* who may—or may not, as the case may be—join me in this verdict. Until then, happy reading! And don't forget: the situation is not hopeless but serious.

Notes

[1] Note, on the other hand, that (Devlin and Rosenberg, 1996) is a fine recent exemplar in this regard.

[2] Jose Ortega Y Gasset once quipped, "I am I plus my surroundings and if I do not preserve the latter, I do not preserve myself." He had situations in mind, if you ask me...

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