GUEST EDITORIAL

Special Issue: Temporal Logic in Engineering

EPHRAIM NISSAN

School of Computing and Mathematical Sciences, University of Greenwich,
Wellington Street, Woolwich, London SE18 6PF, U.K.

Logic-based models are thriving within artificial intelligence. A great number of new logics have been defined, and their theory investigated. Epistemic logics introduce modal operators for knowledge or belief; deontic logics are about norms, and introduce operators of deontic necessity and possibility (i.e., obligation or prohibition). And then we have a much investigated class—temporal logics—to whose application to engineering this special issue is devoted. This kind of formalism deserves increased widespread recognition and application in engineering, a domain where other kinds of temporal models (e.g., Petri nets) are by now a fairly standard part of the modelling toolbox.

The first two papers adopt fairly basic models. Ma, Knight, and Nissan analyze the operation of a simple machine, by applying temporal logic to the machine's state transitions. Silvana Badaloni, instead, elegantly applies a fairly simple temporal logic formalism in a not overly complex industrial context from real life. Next, Balaban and Braha illustrate and discuss a kind of formalism—not a temporal logic—

which, they argue, is amenable to conceptualization as a subset thereof, convenient for such situations when the full power of inference is not necessary.

Theoretically more sophisticated papers follow, which handle temporal reasoning possibly as integrated within such a logic framework that is devised for capturing some other class of information; such is the case of the paper by Lomuscio and Ryan, whose modal logic is mainly about agents' knowledge (epistemic states), yet is augmented with the capability of reasoning about time as involved in the dynamics of the epistemic states of the agents. The last paper, too, is concerned with the epistemic states of agents: Huang and Bell's agents have sensors, and have to handle sensorial perception vis-à-vis beliefs, in a cognitive robotics perspective.

On behalf of the other members of the editorial committee of this issue, Brian Knight and Jixin Ma, I thank the Editor-in-Chief of *AIEDAM*, Bill Birmingham, for his interest in this initiative and for hosting it in his highly respected forum of research at the meet of AI and engineering. We thank everybody who has been involved in the preparation of this thematic issue, and hope to arouse enough interest among the readers to prompt further adoption and application of such techniques.

Reprint requests to: Ephraim Nissan, School of Computing and Mathematical Sciences, Wellington Street, Woolwich, London, SE18 6PF, UK. E-mail: E.Nissan@greenwich.ac.uk, URL: http://www.gre.ac.uk/~E.Nissan (Note: For other two Guest Editors URL is: http://www.gre.ac.uk/{~J.Ma, ~B.Knight}).