

# A Compositional Semantic Structure for Multi-Agent Systems Dynamics



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A COMPOSITIONAL SEMANTIC STRUCTURE FOR  
MULTI-AGENT SYSTEMS DYNAMICS

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op gezag van de rector magnificus  
prof.dr. T. Sminia,  
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De Boelelaan 1105

door

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geboren te Beneden-Leeuwen

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prof.dr. J. Treur

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Playing a major role in the AI curriculum and with a strong focus on long-running, multi-person research projects, the Department of AI of the Vrije Universiteit is a team in every sense. I would like to especially thank my office mates Joeri Engelfriet, and later, Wouter Wijngaards, for their support. With Niek Wijngaards, I never actually shared an office, but if virtual offices exist (they do), we definitely shared one. With Niek, Wouter, FJ Jüngen, Pieter van Langen, Mark Sloof, and Wieke de Vries, fellow Ph.D. candidates, I had many good discussions on multi-agent systems, their advantages, and, most notably, the associated challenges. The same holds, to various extents, for Mehdi Dastani, Catholijn Jonker, Henry Prakken, Leon van der Torre, Rineke Verbrugge, and Mark Willems. Lourens van der Meij and Frank Cornelissen were always available for technical questions concerning the details of DESIRE's implementation.

In my opinion, much research in AI requires close co-operation between the members of a research team. Only in this way, substantial progress can be made. In such teams, each researcher has to stand for his or her own ideas. (My own hobbyhorse was the fight against global state and time. See Chapter 7 for why (i) global time is a bad idea and (ii) it isn't needed, to begin with. I guess my colleagues avoided all words beginning with 'gl' in relation to time in general and semantics in particular, just to be sure.) However, at the same time, for the co-operation to succeed, all participants have to trust the work of others in the project. A good mutual understanding is a pre-condition, and in the Department of AI, this precondition was fully satisfied.

With Joeri, Frank van Harmelen, Mark Willems, and two persons from other research groups at the time, Dieter Fensel and Yde Venema, I embarked on an

important endeavour not directly related to my thesis: the 'dynamics reading group', which actually turned into a writing group. I learned a lot from participating.

The postman dropped the close to 400 pages of my 'final draft' of this thesis at the front door of the members of my reading committee a few days before Christmas, 2000, most likely depriving them of their holidays. I thank Henri Bal, Frank de Boer, Fausto Giunchiglia, Jan-Willem Klop and John-Jules Meyer for their willingness to serve on the reading committee and their prompt replies to my 'final draft'.

Between 1995 and 2000, I was enrolled in SIKS, the National Graduate School for Knowledge and Information Systems. Chances are that no other Ph.D. student has ever followed as many SIKS courses as I did. I encourage all SIKS Ph.D. candidates to break this record! As their best customer (or, probably, most expensive student), I considered it important to share my thoughts about SIKS's policy with its management board. I would like to thank the scientific director, John-Jules Meyer, and the co-ordinators Koen Versmissen and Richard Starmans, for taking my comments very seriously and acting as a proxy for the Board.

This thesis was completed after I moved to the University of Twente. I would like to thank the University of Twente, especially Roel Wieringa, for the facilities and especially the confidence in the completion of this thesis, and my colleagues for their support.

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