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J.UCS Special Issue on Spatial and Temporal Reasoning

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In the last few decades significant progress has been made in the area of spatial and temporal reasoning. There is a growing interest in this area, especially within the artificial intelligence community, which may be attributed to the large number of application domains in which one has to deal directly or indirectly with temporal or spatial information, or both. However, dealing with time and space is not restricted to artificial intelligence. The analysis of concurrent programs, for example, faces difficult temporal questions, while the design of complex hardware for modern computing machines is plagued by spatial problems. Geographic information systems, tracking systems, mobile networks, distributed systems, cooperating autonomous agents, distributed databases, planning, robot motion, and many other complex systems challenge the capabilities of existing knowledge representation methods and reasoning techniques. Even long-standing research areas such as natural language understanding and production line management are brimming with unanswered questions about the interpretation and control of time and space. There is a large body of methods and techniques to attack problems involving space and time, including non-monotonic and modal logics, circumscription methods, chronological minimization methods, relation algebras, and applications of constraint-based reasoning.

At the International Joint Conference on Artificial Intelligence (IJCAI) in Chambéry, France, a first Workshop on Spatial and Temporal Reasoning was held with the purpose of both presenting current research and development in the aforementioned areas and fostering an interchange of ideas among attendees

of differing interests. In particular, discussion was focused on the interfaces between three separate concerns: spatial reasoning in AI, temporal reasoning in AI, and temporal methods for concurrent systems. This effort was continued at similar workshops at various other IJCAI, ECAI, and AAAI conferences. Selected authors from two of the recent workshops were invited to submit extended versions of their papers to this special issue. Five papers submitted were accepted to this issue of J.UCS. As the table of contents indicates, the papers that were accepted for this issue address a variety of aspects involving time and space. It is beyond the scope of a single issue to do so extensively. As a result, the selection presented in this issue is just a snapshot. However, we hope that this snapshot appeals to a large number of researchers.