

MULTI-AGENT TEMPORAL LOGICS WITH MULTI-VALUATIONS

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We study many-valued temporal multi-agent logics based on non-transitive models. The semantical basis, i. e., relational models, are used for modelling of computational processes and analysis of databases with incomplete information, for instance, with information forgotten in the past. In the situation we consider, the agents' accessibility relations may have lacunas; agents may have no access to some potentially known and stored information. Yet innovative point is that in the relational models we consider various valuations V_i for agents' knowledge and a global valuation based on these valuations. Besides, agents' logical operations inside formulas may be nested, as a consequence they may interfere; that is, we consider not autonomous but cooperating agents. Satisfiability and decidability issues are discussed. We find algorithms solving satisfiability problem and hence we obtain the decidability of the decidability problem. Open problems are discussed.

Keywords: many-valued logic, multi-agent logic, temporal logic, computability, information, satisfiability, decidability, deciding algorithms, non-transitive time.

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