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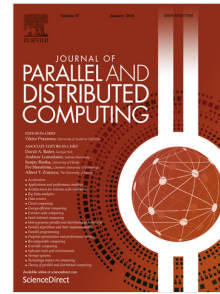
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Decidability Classes for Mobile Agents Computing*

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Abstract

We establish a classification of decision problems that are to be solved by mobile agents operating in unlabeled graphs, using a deterministic protocol. The classification is with respect to the ability of a team of agents to solve decision problems, possibly with the aid of additional information. In particular, our focus is on studying differences between the *decidability* of a decision problem by agents and its *verifiability* when a *certificate* for a positive answer is provided to the agents (the latter is to the former what NP is to P in the framework of sequential computing). We show that the class MAV of *mobile agents verifiable* problems is much wider than the class MAD of *mobile agents decidable* problems. Our main result shows that there exist natural MAV-complete problems: the most difficult problems in this class, to which all problems in MAV are reducible via a natural mobile computing reduction. Beyond the class MAV we show that, for a single agent, three natural oracles yield a strictly increasing chain of relative decidability classes.

Keywords: Theory of distributed computing; mobile computing; distributed decision; rendezvous.

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