Verification of multi-agent systems

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Multi-agent systems are distributed autonomous systems in which the components, or agents, act autonomously or collectively in order to reach private or common goals. Logic-based specifications for multi-agent systems typically do not only involve their temporal evolution, but also other intensional states, including their knowledge, beliefs, intentions and their strategic abilities.

This talk will survey recent work carried out at Imperial College London on verification of multi-agent systems via model checking. Specifically, serial and parallel algorithms for symbolic model checking for temporal-epistemic logic as well as bounded-model checking procedures will be discussed. MCMAS, an open-source model checker, developed in our group, will be briefly demonstrated. Applications of the methodology to the automatic verification of security protocols, web services, and fault-tolerance will be briefly surveyed.

Bio. Dr. Alessio Lomuscio is a Reader at the Department of Computing, Imperial College London, where he leads the group on verification of multi-agent systems. He currently holds an EPSRC Leadership Fellowship. He received a PhD in Computer Science from the University of Birmingham in 1999 and a Laurea in Electronic Engineering from Politecnico di Milano in 1995. Before joining Imperial he was employed as Lecturer at King's College London and Senior Lecturer at University College London. His research interests concern the specification and verification of distributed systems and multi-agent systems by means of techniques based on on computational logic. He has published about 100 research papers on the subject. He is co-author of MCMAS, an open-source model checker for multi-agent systems.