

From model checking to equilibrium checking

Michael Wooldridge¹

Abstract

Equilibrium checking is concerned with establishing whether a given temporal logic formula φ is satisfied in some or all equilibrium computations of a multi-agent system – that is, whether the system will exhibit the behaviour φ under the assumption that agents within the system act rationally in pursuit of their preferences.

After motivating and introducing the framework of equilibrium checking, we present formal models through which rational verification can be studied, and survey the complexity of key decision problems. We give an overview of a prototype software tool for rational verification, and conclude with a discussion and related work.

Michael Wooldridge is a Professor in the Department of Computer Science at the University of Oxford. He has been active in multi-agent systems research since 1989, and has published over three hundred articles in the area. His main interests are in the use of formal methods for reasoning about autonomous agents and multi-agent systems.

Wooldridge is an ACM Fellow, a AAAI Fellow, an ECCAI Fellow, and a member of Academia Europaea. He was the recipient of the ACM Autonomous Agents Research Award in 2006.

¹ University of Oxford, Department of Computer Science, mjw@cs.ox.ac.uk