Talk 1: Early detection of design faults relative to requirement specifications in agent-based models

Agent systems are used for a wide range of applications, and techniques to detect and avoid defects in such systems are valuable. In particular, it is desirable to detect issues as early as possible in the software development lifecycle. We describe a technique for checking the plan structures of a BDI agent design against the requirements models, specified in terms of scenarios and goals. This approach is applicable at design time, not requiring source code. A lightweight evaluation demonstrates that a range of defects can be found using this technique.

Talk 2: On the Testability of BDI Agent Systems

Before deploying a software system we need to assure ourselves (and stakeholders) that the system will behave correctly. This assurance is usually done by testing the system. However, it is intuitively obvious that adaptive systems, including agent-based systems, can exhibit complex behaviour, and are thus harder to test. In this paper we examine this “obvious intuition” in the case of Belief-Desire-Intention (BDI) agents, by analysing the number of paths through BDI goal-plan trees. Our analysis confirms quantitatively that BDI agents are hard to test, sheds light on the role of different parameters, and highlights the enormous difference made by failure handling.