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USING AUTOMATED PLANNING TO ENABLE AUTONOMIC PROPERTIES IN COMPUTER SYSTEMS

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ABSTRACT

Most control systems embodying artificial intelligence (AI) techniques tend to be "reactive" rather than "deliberative" in many application areas. However, there arises the need for systems that can sense, interpret and deliberate with their actions and goals to be achieved, taking into consideration continuous changes in state, required service level and environmental constraints. The requirement of such systems is that they can plan and act effectively after such deliberation, so that behaviourally they appear self-aware.

Autonomic control systems are an important class of such control systems, because of the desirable properties that they offer: the ability to self-manage, self-configure, self-protect and self-optimise. Creating generic technology that enables control systems to automatically reason with knowledge of their controls, in order to generate plans and schedules to manage themselves, would be a major breakthrough in the realisation of autonomic properties in such systems. In this project we explore the use and potential exploitation of deliberative AI techniques, in particular recent advances in Automated Planning.

This project aims to perform ground-breaking research in order to show the potential of Automated Planning technology in embodying systems with self-management. We aim to take traditional control system architecture, situated in the area of traffic control, and embed it with deliberative planning components. We will evaluate it by comparing its behaviour to a traditional control system, and assessing the effort and challenges required to embody such symbolic reasoning within a real time environment.

Keywords autonomic systems automated planning and scheduling control systems