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USING AUTOMATED PLANNING TO ENABLE AUTONOMIC PROPERTIES IN COMPUTER SYSTEMS

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RESEARCH QUESTION

• In today’s complex heterogeneous systems, autonomic properties (self-management, self-maintenance, self-protection) are very desirable.

• Typically, such autonomic properties implemented in systems tend to exhibit “reactive” rather than “deliberative” behaviour.

• In many applications (For example - AUVs, Traffic Control) there is a need for systems that can sense, interpret and “deliberate” with knowledge of their actions, goals and environment in order to produce plans to meet their service level requirements.

AIM

• 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.

METHODOLOGY

• 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.

• We explore the use and potential exploitation of deliberative AI techniques, in particular recent advances in Automated Planning.

RESEARCH SIGNIFICANCE

• Autonomic control systems are an important class of control systems, because of the desirable properties that they offer: 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.

Keywords autonomic systems, automated planning and scheduling, control systems