University of Huddersfield Repository

Jimoh, F. and McCluskey, T.L.

Using automated planning to enable autonomic properties in computer systems

Original Citation


This version is available at http://eprints.hud.ac.uk/13486/

The University Repository is a digital collection of the research output of the University, available on Open Access. Copyright and Moral Rights for the items on this site are retained by the individual author and/or other copyright owners. Users may access full items free of charge; copies of full text items generally can be reproduced, displayed or performed and given to third parties in any format or medium for personal research or study, educational or not-for-profit purposes without prior permission or charge, provided:

- The authors, title and full bibliographic details is credited in any copy;
- A hyperlink and/or URL is included for the original metadata page; and
- The content is not changed in any way.

For more information, including our policy and submission procedure, please contact the Repository Team at: E.mailbox@hud.ac.uk.
USING AUTOMATED PLANNING TO ENABLE AUTONOMIC PROPERTIES IN COMPUTER SYSTEMS

F. O. Jimoh and T. L. McCluskey.
AI/KEII Research Group, Department of Informatics, Computing and Engineering

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.

The Role of APS...

Road traffic support systems embodying AI techniques tend to be “reactive” rather than “deliberative” (aka self-aware)

...great potential for exploitation of deliberative AI via the integration of recent advances in APS

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.

SELF*

Characteristics of AC

- Self-Configuring
- Self-Healing
- Self-Optimising and
- Self-Protecting

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