Dependable Robots through Model-Based Techniques by Gerald Steinbauer-Wagner

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Gerald Steinbauer-Wagner received a M.Sc in Computer Engineering and a PhD in Computer Science in 2001 and 2006 from Graz University of Technology. He is an associate professor at the Institute for Software Technology (IST) at the Graz University of Technology and leads the research group on Autonomous Intelligent Systems. He works on robustness and dependability of autonomous mobile robots. His research interests include autonomous mobile robots, sensor fusion, world modeling, robust robot control, cognitive robotics, search and rescue robots, knowledge representation, reasoning, model-based diagnosis, planning and RoboCup. In particular he is interested to integrate AI techniques into a complete robot system rather than focusing on individual parts in isolation. He published several dozens papers in journals, conferences and workshops. He organized a number of workshops and other scientific events and is very active in the RoboCup community.

Abstract

Although, there are tons of impressive videos out there surprisingly enough autonomous robots frequently fail in performing moderate complex every day tasks in every day environments. Reasons are manifold and origin mainly from the perception-decision-action cycle interacting with the environment. Having an insight for the root causes is valuable for the robot itself to act dependable. But it is also important for the developer as intelligent robots are complex constructs with often a lack of introspection. The DX community focuses their effort to run-time verification (e.g. monitoring and diagnosis) in order to improve the dependability of such complex machines. In this talk we like to focus on the development/life cycle of an autonomous robot from the design over the implementation to the deployment. We like to emphasize that in all of these stages can benefit from the application of model-based approaches to improve dependability. We will motivate this holistic view and will present techniques developed to tackle the different stages of the life cycle of robot in different domains such as logistics or production.