Process Model for the Development of Semi-Autonomous Service Robots

By Oliver Prenzel

Shaker Verlag Sep 2009, 2009. Taschenbuch. Condition: Neu. Neuware - The creation of a universal service robot for daily use in the home or working environment is an ambitious objective of ongoing research and engineering efforts. Considering today's state-of-the-art, service robots cannot be expected to be able to act fully autonomously and intelligently in unstructured environments within the middle-term future. This is due to the generally high complexity of meaningful task executions, with still unsolved problems in task and motion planning as well as sufficient scene understanding. To encounter these problems, an approach has been developed that reduces the technical complexity with the help of two development paradigms: The task knowledge for a certain scenario is pre-structured, and the robotic system executes its tasks semi-autonomously, i.e. involves the user into task execution. By means of simulations in representative sample scenarios it has been demonstrated that the real time suitability of task planning based on this approach can be guaranteed. Within this work, the fundamental concepts are now integrated into a complete process model for the development of semi-autonomous service robots. The process model gives a clear guidance for a scenario- and behavior-driven development of a service robotic system. The process...

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