Workshop

Dynamic Motion Planning for Robot Manipulators with ROS MoveIt!

25 November 2015

13h00 – 17h00

Prof Dr Alexander Ferrein & Dr Faraj Alhwarin

Mobile Autonomous Systems & Cognitive Robotics Institute
FH Aachen - University of Applied Sciences
Department of Electrical Engineering and Information Technology

Overall Aim of Workshop

The overall aim of the workshop is to give a brief introduction to the ROS MoveIt! package. We will show how to combine 3D perception with motion planning for robot manipulators. During this workshop we will give a basic introduction of the MoveIt! package, show how to model a robot design using URDF, and how to do dynamic motion planning with the package in simulation.

What is ROS (Robot Operating System?)

ROS (Robot Operating System) is an open source framework for robotic application development with the philosophy to promote code reuse against the repetitive code work among different programmable robots. It is based on graph architecture with a centralized topology where the processing takes place in nodes. It also provides an extensible interprocess communication mechanism which simplifies the design of distributed systems. MoveIt! is a ROS software package for motion planning, manipulation, 3D perception, kinematics, control and navigation. For this goal, MoveIt! collects a set of state-of-the-art software libraries to work together including Open Motion Planning Library (OMPL) for motion planning, Kinematics and Dynamics Library (KDL) for kinematics solving, Flexible Collision Library (FCL) for collision checking and Octomap for 3D environment representation. Moveit! exploits the functionalities of these libraries as plug-ins to facilitate swap and extending of its components at any time.

Presenters

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Dr. Faraj Alhwarin received his Master's degree in Automation and Information Engineering in 2007 and Ph.D degree in 2011 from the University of Bremen, Germany. Currently, he is working as a scientific researcher at the University of Applied Science in Aachen. His research interests include computer vision, image processing and their applications in robotics.

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Alexander Ferrein received his MSc in Computer Science (Dipl.-Inform.) and his PhD (Dr. rer. nat) from Aachen University in 2001 and 2007, resp. Between 2009-2011 he joined the Robotics and Agents Research Lab, University of Cape Town, as a postdoctoral research fellow with Feodor-Lynen scholarship granted by the Alexander-von-Humboldt Foundation. He then re-joined the Knowledge-Based Systems Group at Aachen University before he became a professor for Robotics and Computer Science at FH Aachen University of Applied Sciences. He is a founding member and director of the Mobile Autonomous Systems & Cognitive Robotics Insitute at Aachen Applied Science University. His research focuses on the field of Artificial Intelligence and Cognitive Robotics.