Alexander Skoglund Programming by Demonstration of Robot Manipulators

Alexander Skoglund has been a graduate student at the Center for Applied Autonomous Sensor Systems (AASS), Örebro University, Sweden. His research interests include Programming-by-Demonstration, learning systems, human-machine interfaces, and humanlike motions. Programming a robot usually requires a robot programmer. A new program is written for every new task the robot may encounter. It would be beneficial if a non-programmer could instruct the robot simply by showing it *what* to do and *how* to do it.

This thesis investigates some problems associated with the transfer of skills from a human to a robot. A robot manipulator with a morphology which is very different from the human arm simply cannot copy a human motion, but has to execute its *own version* of the task. When a task once has been demonstrated to the robot it must also be able to generalize this knowledge to other similar tasks, without a new learning process.

This thesis contributes to the field of Programming-by-Demonstration in the application of Takagi-Sugeno fuzzy modeling for trajectory modeling, a next-state-planner for trajectory generation, and how to use the notion of hand-states in this context.

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