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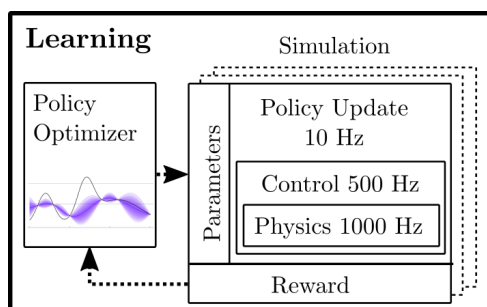Department of Computer Science

Master Project: Learning Tasks with Dual-Arm Coordination

Complex and dexterous tasks often require more than one hand to solve. The same holds true when using robot arms. While traditionally programmed setups often use special fixtures and static environments, the trend goes towards more flexible setups that can easily be reconfigured. One solution to coordinate two arms is to do time consuming and complex planning.

The goal of this thesis project is to evaluate the use of reinforcement learning (RL) as a different or complementing strategy to master tasks that need coordination of both arms. Learning will be parallelized in simulation and the most successful policies are going to be executed on the real system.

Your Tasks

At first you search and discuss related work in the field and get familiar with a recent RL-framework as well as the skill-based system SkiROS [1]. You will extend the RL-framework to support dual-arm tasks and learn behaviors in simulation. The approach will be evaluated on a set of learning problems in an industrial setting.

Requirements

- Independent, diligent and structured way of working

- Knowledge in C++ and Python

- (Optional) Courses that covered AI or RL methods and robotics

- (Optional) Experience with Linux & ROS

Start Date

- Now or later

What we offer

- State-of-the-art Research

- Option to publish the results

- Regular supervision

- Freedom to explore interesting topics

- Freedom to schedule your time

Key Words

- Dual-arm robots

- Reinforcement Learning

- Industrial Tasks

For questions and applications, feel free to contact me at
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[1] https://github.com/RVMI/skiros2