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F O R S C H U N G S P R A X I S

for

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Student ID , Degree EI

Online grasp correction exploiting previous perception experience

Problem description:

Robotic grasping in unstructured environments is still an open problem in the robotic community. In order to increase the flexibility and to avoid manually programming robotic systems, paradigms based on imitation learning and reinforcement learning are a potential, promising solution. Such learning approaches leverage parametric representations of motion trajectories. A well-known method to parameterize trajectories is based on Dynamical Movement Primitives (DMPs) [2]. When using learning approaches, an important issue is to achieve robustness at the execution time when unexpected changes occur in the scene. A possible solution is proposed in [1], in which the authors include in the DMP framework an online perception-based component. The student will implement an algorithm based on the methodology proposed in [1] to achieves an enhanced grasp robustness in presence of uncertainties in the scene.

Work schedule:

- Literature study on robotic grasping
- Implementation of the methodology proposed in [1]
- Test of the implemented algorithm on a KUKA manipulator

Bibliography:

- [1] Peter Pastor, Ludovic Righetti, Mrinal Kalakrishnan, and Stefan Schaal. Online movement adaptation based on previous sensor experiences. In *Intelligent Robots and Systems (IROS), 2011 IEEE/RSJ International Conference on*, pages 365–371. IEEE, 2011.
- [2] Stefan Schaal. Dynamic movement primitives—a framework for motor control in humans and humanoid robotics. In *Adaptive Motion of Animals and Machines*, pages 261–280. Springer, 2006.

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