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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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Real-time Tracking of Human Hand Motion with a RGB-D Camera

Problem description:

A key challenge in modern robotics and biomedical engineering is to design artificial hands able to reproduce human abilities. The difficulty to handle human-like manipulation problems is mainly due to the high number of Degrees of Freedom (DOFs) concentrated in a small volume. As a consequence, control of robotic grasp and manipulation is an interesting challenges for engineers and scientists in the fields of robotics and machine learning. In order to apply imitation learning methods to control anthropomorphic hands, techniques are required to track human hand motion. The objective of this work is to set-up a system for real-time human hand tracking with a RGB-D camera, starting from the approach presented in [1]. Optionally, the student will extend the approach presented in [1] by including a second camera, in order to improve the robustness of the system.

Work schedule:

- study the work presented in [1]
- based on [1], set up a system for human hand tracking with a kinect camera
- visualization in RVIZ of the estimated joint positions
- (optional) extend the system by including a second kinect camera

Bibliography:

[1] Andrea Tagliasacchi, Matthias Schröder, Anastasia Tkach, Sofien Bouaziz, Mario Botsch, and Mark Pauly. Robust articulated-icp for real-time hand tracking. In *Computer Graphics Forum*, volume 34, pages 101–114. Wiley Online Library, 2015.

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