

Forschungspraxis, Master's Thesis

Reinforcement Learning for Estimating Virtual Fixture Geometry to Improve Robotic Manipulation

Robotic teleoperation is often used to accomplish complex tasks remotely with human-in-the-loop. In cases, where the task requires very precise manipulation, virtual fixtures can be used to restrict and guide the motion of the end effector of the robot while the person teleoperates. In this thesis, we will analyze the geometry of virtual fixtures depending on the scene and task. We will use reinforcement learning to estimate ideal virtual fixture model parameters. At the end of the thesis, the performance can be evaluated with user experiments.

Prerequisites

Useful background:

- Machine learning (Reinforcement Learning)
- Robotic simulation

Requirements:

- Experience with Python & Deep learning frameworks (PyTorch / Tensorflow...)
- Experience with a RL framework
- Motivation to yield a good outcome

Contact

(Please provide your CV and transcript in your application)

furkan.kaynar@tum.de

diego.prado@tum.de

Advisors

Diego Fernandez Prado, Hasan Furkan Kaynar