

July 4, 2019

F O R S C H U N G S P R A X I S
for
Mariem Khlifi
Student ID 03709738, Degree EI

Robotic manipulation including vision system for 6D pose estimation

Problem description:

In this Forschungspraxis, the student will implement a solution for the case of a robot in a convenience store. State-of-the-art Deep Learning algorithms will be implemented for the 6D pose estimation of the objects in the store, in order to ensure a smooth interaction of the robot with its environment. This can be achieved through a Convolutional Neural Network based on the localization of the centre of the object in the image [2]. A reaching action will then follow to allow the robot to grasp the detected object [1].

Work schedule:

- Literature research,
- Implement algorithm for 6d pose estimation of objects in the robot's environment,
- Implement the mapping from the pose of the detected object to the robot's hand,
- Integration of sensory information in deep learning algorithms for object classification.

Bibliography:

- [1] Pastor P. Krizhevsky A. Ibarz J. Quillen D. Levine, S. Learning hand-eye coordination for robotic grasping with deep learning and large-scale data collection. In *The International Journal of Robotics Research*, page 421436. 2018.
- [2] Yu Xiang, Tanner Schmidt, Venkatraman Narayanan, and Dieter Fox. Posecnn: A convolutional neural network for 6d object pose estimation in cluttered scenes. 2018.

Supervisor: Prof. Dongheui Lee
Start: 26.08.2019
Delivery: 27.10.2019

(D. Lee)
Univ.-Professor