# Master- / Projektrarbeit

Development of ML-Based Optimal Strategies for Object Gripping

Grasping objects from a random pile poses significant challenges for robots. Differentiating between objects becomes difficult due to position and proximity constraints, limiting the available grasping options. The goal of this thesis is to develop a straightforward approach to sequentially grasp unknown objects from a random collection. This is done by identifying individual objects, namely, its shape and coordinate, within the pile using object detection, determine the most suitable candidate for grasping, and execute the most reliable grasp for that candidate. The practical experiments are carried on using Universal-Robot e-series (UR5e) with Robotiq gripper and Microsoft cameras.
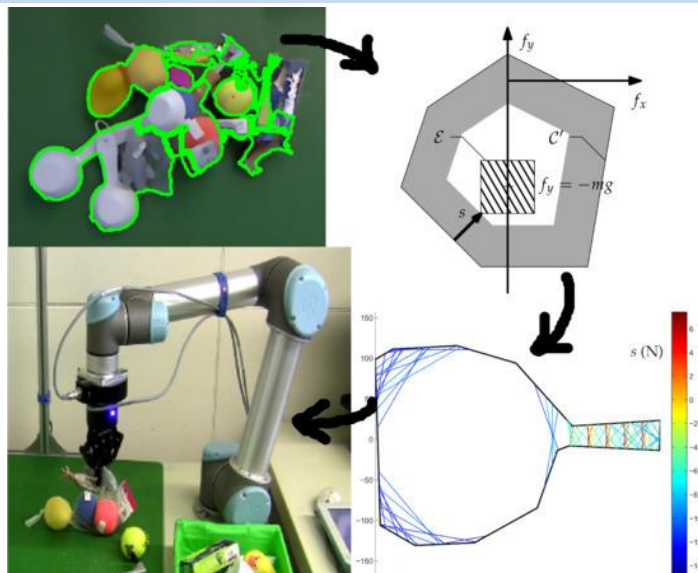
Aufgabenstellung/Tasks:
- Implementaiton of object detection (Creating custom data-set)
- Idetintifying and mathmatically evaluating their gemetry (centroids, holes, ..).
- Review the object and the optimal gripping location based on certain criteria.
- Publishing data over ROS.
- Testing on real hardware.

Aufgabenstellung / Pre-requisites:
- Very good english communication skills (German is nice to have)
- Basic knowledge Robot Operation System (ROS).
- Solid understanding of machine learning, neural network.
- Experience with Python, C++ is Nice to have.

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Der Umfang wird der Art der Arbeit angepasst.
Beginn: Nach Absprache
Aushang: