Deep Reinforcement Learning for Robotic Grasping from Octrees

Learning Manipulation from Compact 3D Observations

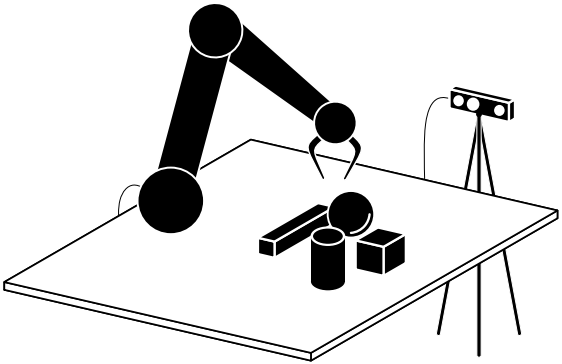
June 25, 2021

Andrej Orsula

Aalborg University
Denmark

AALBORG UNIVERSITY

Vision-Based Robotic Grasping of Diverse Objects



Vision-Based Robotic Grasping of Diverse Objects

Approach

Approaches

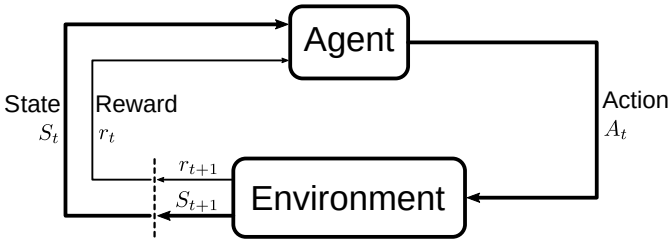
- Analytical
- Empirical
  - Supervised Learning
  - Imitation Learning
  - Reinforcement Learning

Vision-Based Robotic Grasping of Diverse Objects

Approach

Approaches

- Analytical
- Empirical
  - Supervised Learning
  - Imitation Learning
  - **Reinforcement Learning**



Task Definition

Agent

- High-level controller
- End-to-end policy

Environment

- Objects
- Robot
  - Low-level controllers
- Physics and visuals

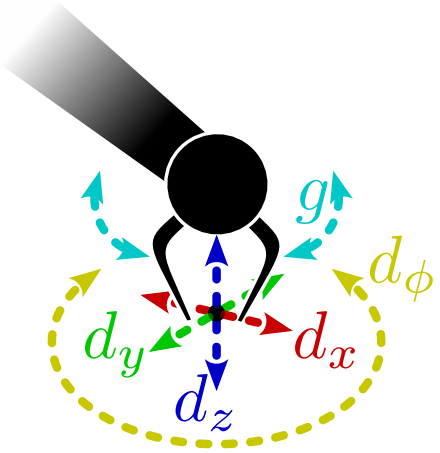
Episodic Task

- Success
  - Lifting an object
- Failure
  - Pushing all objects away
- Max 100 time steps
  - ~40 s (simulation)

Action Space

Actions in Cartesian space

- Translational displacement
  - (d_x, d_y, d_z)
- Gripper rotation d_ϕ
- Gripper actions g
  - Closing
  - Opening



Thank you for your time

AALBORG UNIVERSITY