

DLO Dataset Paper - Master

TOP

- Paper on Overleaf
- This master repo

Tasks Assignments

- Paper structure and sections (Bardia, due Mon. 1/9)
- Data collection (Bardia & Chris, Wed. 1/11):
 - Test procedures: after background research → discuss and revise
 - Learning from demonstration API, pick and place
 - Record UR5 movement commands
 - DLO configuration estimation via AprilTags
 - DLO free end pose estimation via AprilTags
- DLO mount update design and print (Maicol, Mon. 1/9)

ToDo - Bardia

- ☐ Write paper
- Read:
- UR5
 - IP: 192.168.1.147
 - ☐ urdfpy - URDF parser in Python
 - ☐ program and record
 - ☐ pick and placement
 - ☐ UR5 bullet sim
- ☐ Setup work cell:
 - ☒ Order parts
 - ☐ Black cloth
- ☐ Gripper
- ☐ AprilTags
 - ☐ Making Apriltags
 - ☐ 6D pose est. with Apriltags

ToDo - Maicol

- Update DLO mount design
- Print new design
- Setup CAD/Drawing
- DLO mount drawing

Links

UR5e Docs

- UR5e script manual

Important Links

- Realsense docs
- RealSense Tools
- Intel Realsense (v2.5) Repo
- Cobot control via python sockets

Other Links

- depth post-processing for intel rs d400 series

Software Environment and Dependencies

- Ubuntu 20.04
- LibRealSense v2.50.0
- Python

Setup

Hardware

- D455 - overhead depth camera
- L515 - gripper depth camera (maybe)
- UR5e
- DLOs
- DLO Mount

Installation

```
pip install urdfpy
pip install pyrealsense2
```

Test Goals

- Clamped end low, DLO on table and flat, change gripper pose, no twist on DLO: @ omega shape, s shape, u shape, circle shape, ellipse shape, spiral.
- Clamped end low, DLO on table and 3D, with a twist: same shapes.
- Clamped end low, DLO angles at 30 degrees and 3D, without a twist.
- Clamped end low, DLO angles at 45 degrees and 3D, without a twist.
- Clamped end low, DLO angles at 60 degrees and 3D, without a twist.
- Clamped end low, DLO angles at 75 degrees and 3D, without a twist.
- Clamped end low, DLO angles at 90 degrees and 3D, without a twist.

- Clamped end low, DLO angles at 30 degrees and 3D, with a twist.
- Clamped end low, DLO angles at 45 degrees and 3D, with a twist.
- Clamped end low, DLO angles at 60 degrees and 3D, with a twist.
- Clamped end low, DLO angles at 75 degrees and 3D, with a twist.
- Clamped end low, DLO angles at 90 degrees and 3D, with a twist.

DLOs and Cables

- Thick hose
- AWG 10 red and black and CAT-6 bundle
- CSA LL90485 Water resistant with three AWG 16 conductors
- Yellow Southwire E51583(UL) AWG 14 wire

Archive

Will not use ROS

- ROS2 Foxy Fitzroy
- ROS2-legacy wrapper