

# Robotics

## Exercise 2

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### 1 Multiple Tasks

In the exercises for the robotics course, you used "tasks" to control a robot to different positions. In `/teaching/teaching/17-Practical/e02-tasks/`, you will find a `main.cpp` file. This file demonstrates an expanded interface from our robotics course with multiple tasks and types of tasks.

- a) Please edit this file so that the robot picks up "obj1", and places it 5cm to the robot's right.
- b) Try to maintain the orientation of the object, as if it were a cup of water.
- c) Limit the acceleration of the end effector, so that the cup doesn't spill.
- d) Create your own exercise to make the robot "do something cool".
  - You can do tasks relative to the object, or using absolute positions / orientations.
  - Acceleration is contained within the control task, specifically within the "PD" motion profile. See "taskControl.h"
  - There are *many* ways to complete the exercise. Try a few different ones!

### 2 Project Proposal

For projects, it is important to be able to communicate the project scope, goals, requirements, and milestones / deadlines.

For next Thursday, please create a project proposal with the following:

- Project Description - a short, high-level description of the project. "For this project, a robot will catch a ball."
- Goals / Requirements - more specific, technological requirements of the project, ie. "the position of the ball is sensed using a webcam".
- Technologies / Libraries - please give a list of different software libraries that you plan to use to achieve your goals, ie. "OpenCV, with filtering based on color", "USB webcam connected to laptop", "TurtleBot with basket on top"
- Milestones / Deadlines - start outlining how the different goals will be reached, and when.

If you are still deciding between multiple projects, the process of creating this document will hopefully help you decide which project makes more sense. This document is **not binding**, meaning you are not committing to complete anything you propose. However, it is meant to get you thinking more concretely about your projects.