



# Robotics: Final Project

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30.10.2023

# Overview

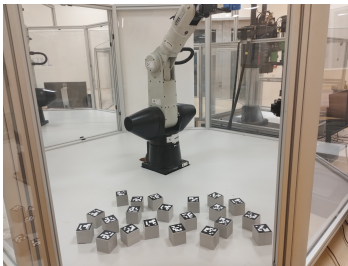
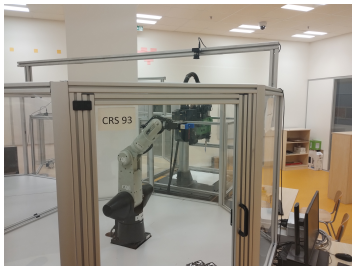
- ▶ Motivation: practical experience with real hardware
- ▶ Team of two students
- ▶ Two options for the project
  - ▶ Clean the workspace: pick-and-place with 6 DoF robot and vision
  - ▶ Drawing with a robot: draw polygons with 4 DoF robot





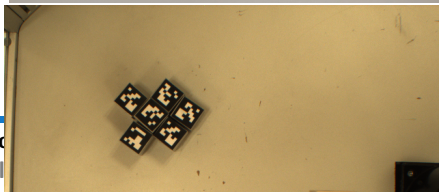
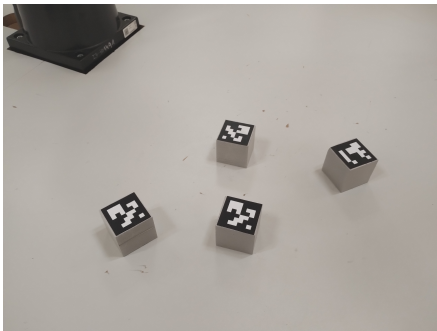
# Option #1: Clean the workspace

- ▶ External camera, 3 robots
- ▶ Cubes with AruCo markers on top
- ▶ Goal: transfer all cubes into boxes



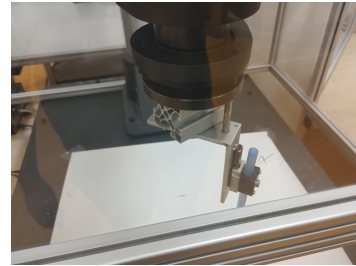
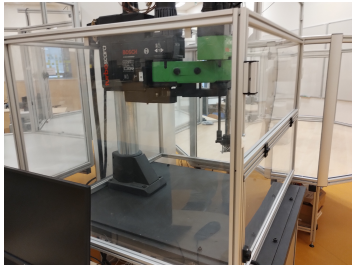
## Option #1: Clean the workspace, variants

- ▶ Variant A: planar problem, separated cubes (max 10 points)
- ▶ Variant B: planar problem, touching cubes (max 15 points)
- ▶ Variant C: non-planar problem (max 20 points)
- ▶ Variant D: non-planar problem in ROS (max 23 points)



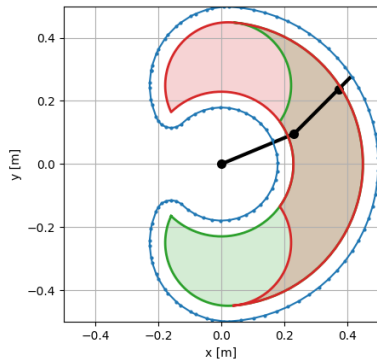
## Option #2: Draw with a robot

- ▶ Draw polygon on a given pose
- ▶ No vision



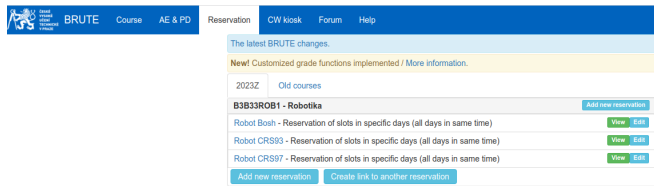
## Option #2: Draw with a robot, variants

- ▶ Variant A: polygon fits into intersection of the red and green (max 5 points)
- ▶ Variant B: polygon fits either to the red or green (max 7 points)
- ▶ Variant C: polygon fits into union of red and green (max 10 points)
- ▶ Variant D: polygon fits into robot workspace (blue) (max 15 points)



# Laboratories

- ▶ Sharing the resources: reservation system in BRUTE
- ▶ Consultations
  - ▶ during the labs: one of TAs (Krsek, Smutny, Petrik) is prepared on a phone
  - ▶ other timeslot: contact all TAs by email



The screenshot shows the BRUTE reservation system interface. The top navigation bar includes the university logo, 'BRUTE', and menu items: 'Course', 'AE & PD', 'Reservation', 'CW kiosk', 'Forum', and 'Help'. Below the navigation bar, there is a section for 'The latest BRUTE changes.' with a yellow highlight for 'New! Customized grade functions implemented / More information.' Below this, there are tabs for '2023Z' and 'Old courses'. The main content area displays a list of courses for '2023Z' under the heading 'B3B33ROB1 - Robotika'. The list includes:

- Robot Bosh - Reservation of slots in specific days (all days in same time) with 'View' and 'Edit' buttons.
- Robot CRS93 - Reservation of slots in specific days (all days in same time) with 'View' and 'Edit' buttons.
- Robot CRS97 - Reservation of slots in specific days (all days in same time) with 'View' and 'Edit' buttons.

At the bottom of the list, there are two buttons: 'Add new reservation' and 'Create link to another reservation'.



# Delivering final project

- ▶ Technical report and demonstration
- ▶ Report needs to be uploaded in advance
- ▶ Reservation system for the last week of the semester and exam-period
- ▶ **Contact us if you want to deliver sooner**

