

# 1<sup>st</sup> Assignment

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# Exercise with ROSBOT

- Try connecting to the robot, and visualize robot topics, as well as controlling the robot remotely (check the ROS\_DOMAIN\_ID for each robot)
- If everything works, subscribe to the camera image topic (the compressed one!) and try running the node for detecting markers.
- Try to implement a simple visual servoing control that keeps the marker in the centre of the image (see hint in the last slide)

# Assignment 1

- Spawn a robot (you can use the one built in class) in an environment with 5 Aruco markers (with different IDs). Put them all in circle, so that only by rotating the robot can find all of them
- Develop a node that, after all IDs have been identified, moves the robot to the marker with the lower ID, so that the marker is in the center of the image, and publishes a new image on a custom topic, with a circle around the marker found
- The robot repeats the same behaviour for all the other markers, in ascending order
- Optional: repeat the same behaviour, but changing the controller of the robot with a skid-steer drive controller (the robot should then have 4 wheels)
- Optional: implement the behaviour also with the real robot

# Assignment 1

- Hints:
  - The function `cv::aruco::detectMarkers` also returns the marker corners. You can use the marker corners for controlling the position of the robot and for drawing the circle
  - Try implementing the system in simulation, and when it works, you can come to the lab to try it with the real robot. You may just need to adapt the names of the topic

# Evaluation

Code structure and clarity

Organization of the repo (documentation, presence of a readme, video,...)

Respect of the deadline

Optional parts

**Deadline: 14/12/2025**