ROBOTICS PROJECT

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OVERVIEW

- 6 practical sessions (4h each): 24 h
  - Friday 14:00-18:00
  - ROS2 Robotics programming exercises (step-by-step tutorials)
  - Evaluation:
    - Assessment of your competences on ROS2 and IK solving
    - 30% of total score
    - Project by group of 4-5 students

- Content of the project:
  - Calculation of the inverse kinematics of a robot manipulator
  - Programming of an industrial robot for a desired application:
    - Python Programming
    - Robot Operating Software (ROS2)

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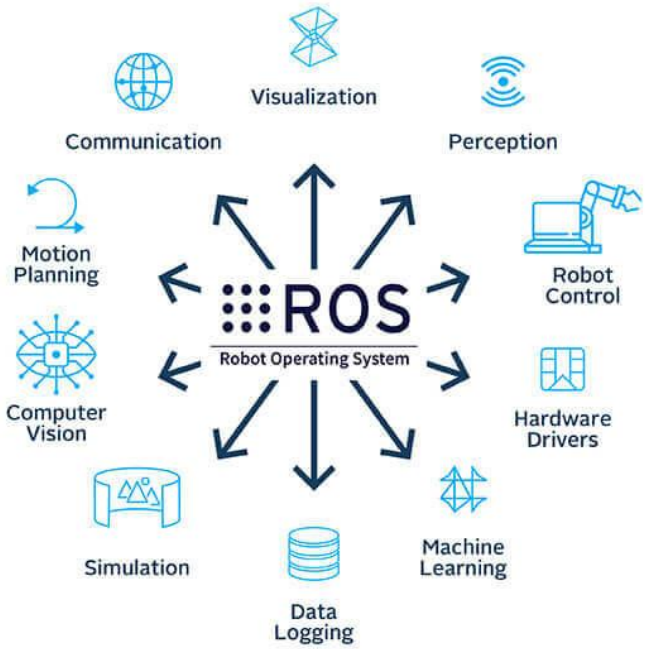
WHAT IS ROS?

- **R**obot **O**perating **S**ystem
- It provides:
  - A set of software libraries and tools to build robot applications.
  - A communication framework
- Originally developed in 2007 at the Stanford Artificial Intelligence Laboratory.
- Since 2013 managed by OSRF (Open Source Robotics Foundation).

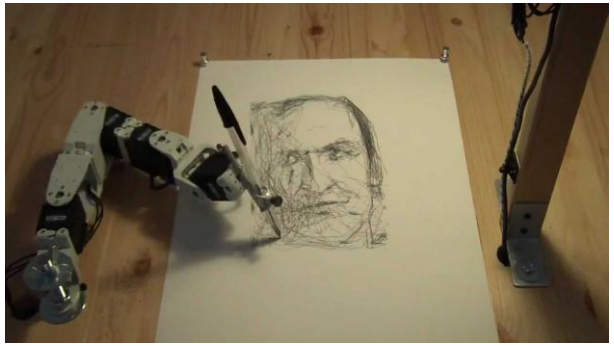


YOUR ROBOT

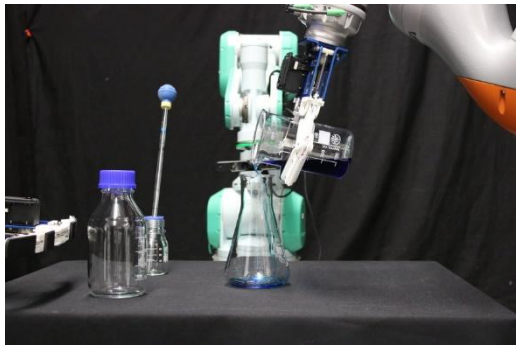
- Modular collaborative robot
- ROS2 runs natively on each joint
- Payload of 3kg
- Weight: 21kg
- Reach: 656 mm

Mara (Acutronic Robotics)

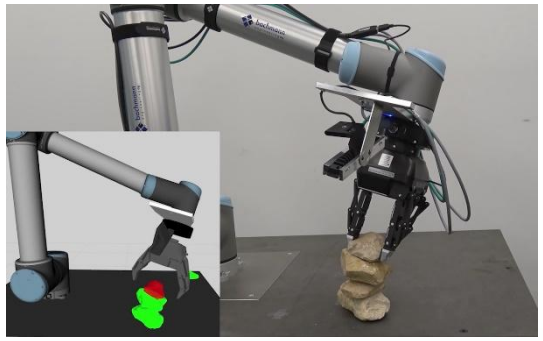
SOME EXAMPLES OF DEMOS



Writing/drawing



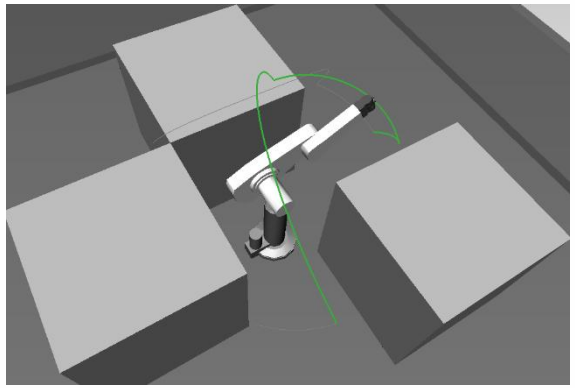
Liquid pouring



Tower building

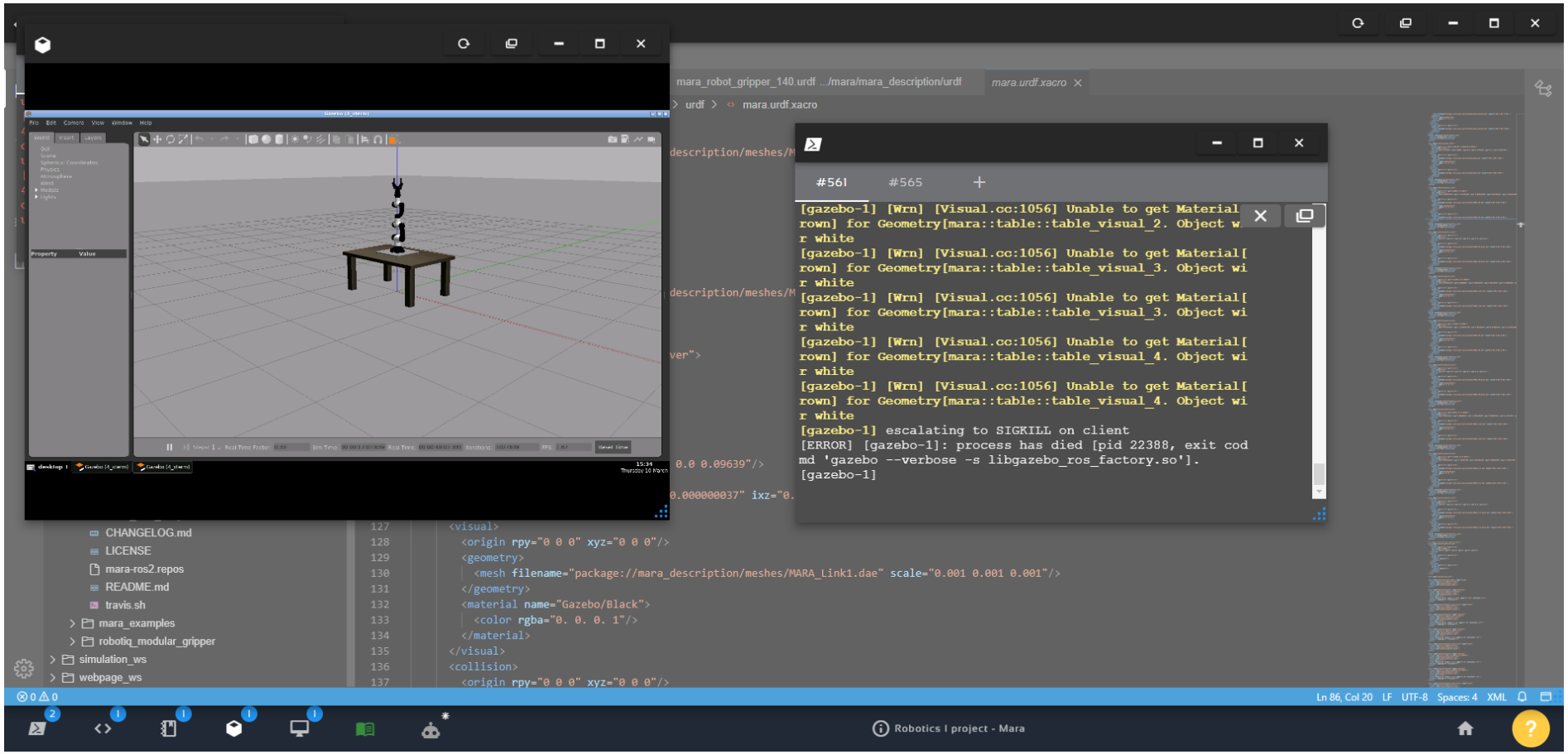
Pick and place

Sorting



Reaching target with obstacle avoidance

E-LEARNING PLATFORM FOR ROS



https://app.theconstruct.ai/

PLANNING

- Week 1 (21/03): Project presentation + ROS2 basics
- Week 2 (04/04): Understanding ROS2 topics + Project selection
- Week 3 (11/04): Calculation of inverse kinematics of the robot.
- Week 4 (09/05): Programming of the robot for your scene.
- Week 5 (16/05) – 6 (23/05): Final test of the demo + writing of the report (10-15 pages)