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# Juggling Robot

**Project Number**: 19-1-1-1829
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## Objectives

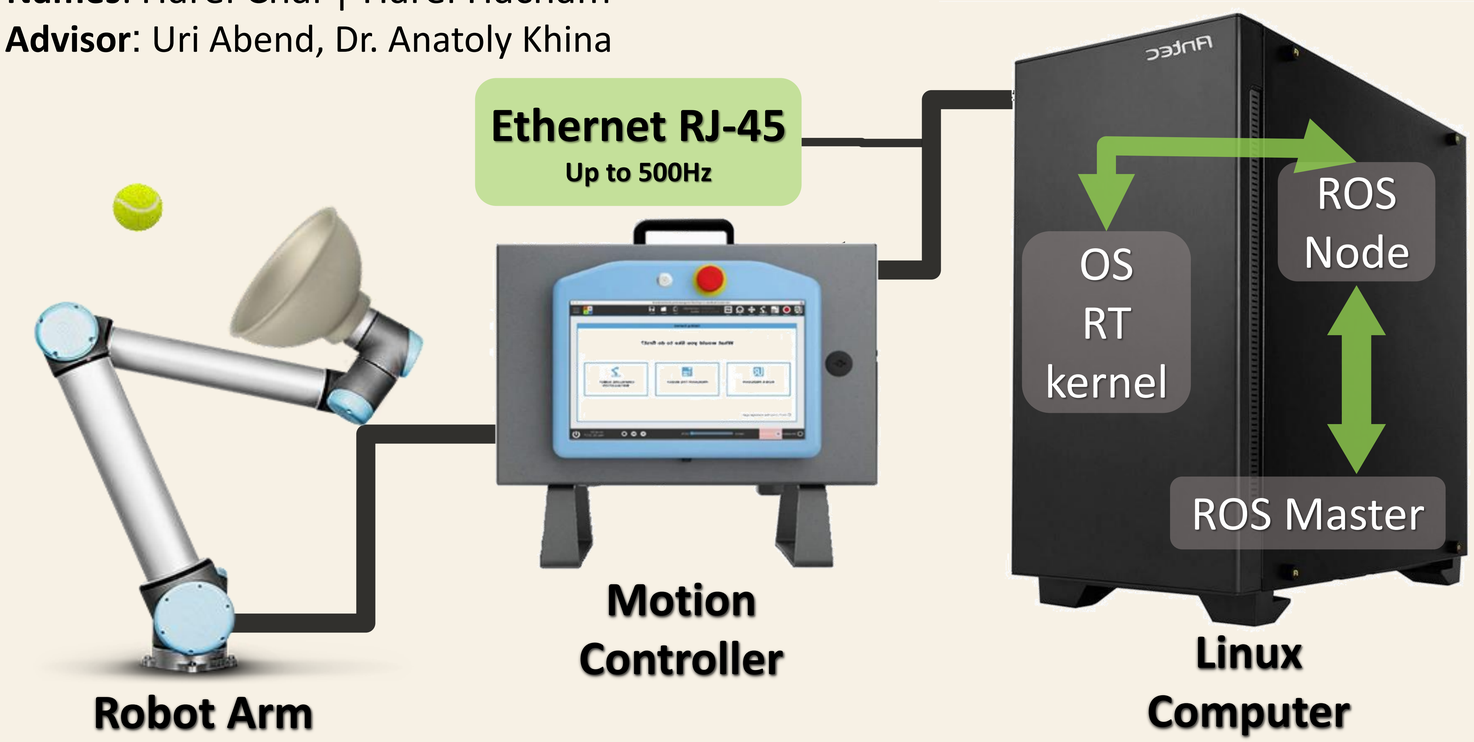
- ❑ Control UR3E robot arm via the robot operating system (ROS)
- ❑ Utilize the Real Time Data Exchange (RTDE) at com. rates of up to 500Hz
- ❑ Build work environment for script-base control of the UR3E arm
- ❑ Lay groundwork for closed-loop arm control via image sensors

## Implementation

- ❑ UR3E controller & PC connected via LAN and communicating at 500Hz
- ❑ Direct communication with the controller via ROS using UR3E drivers
- ❑ Advanced planning features using MoveIt in C++
- ❑ Graphical control also possible via rviz and ROS MoveIt packages

## Results

- ❑ Fast and steady 500Hz communication from and to the UR3E arm
- ❑ Easy to use & common environment for coding for robots
- ❑ Robust infrastructure for sensor-based closed loop control system
- ❑ Multiple options for future work and integration:
  - ○ ROS controller
  - ○ MoveIt
  - ○ Direct RTDE controller programming




**ROS GUI**
- ❑toolkit
- ❑RvizPlugin base GUI
- ❑introspection

**ROS-I Configuration**
- ❑urdf
- ❑Parameters
- ❑ROS-I convention

**ROS Layer**
Anything in the ecosystem

**MoveIt Layer**
- ❑ Planning
- ❑ Kinematics
- ❑ Pick & Place
- ❑ State

**ROS-I Interface Layer**
Package: industrial_robot_client

**ROS-I Simple Message Layer**
Package: simple_message

**ROS-I Controller Layer**
Package: vendor specific