

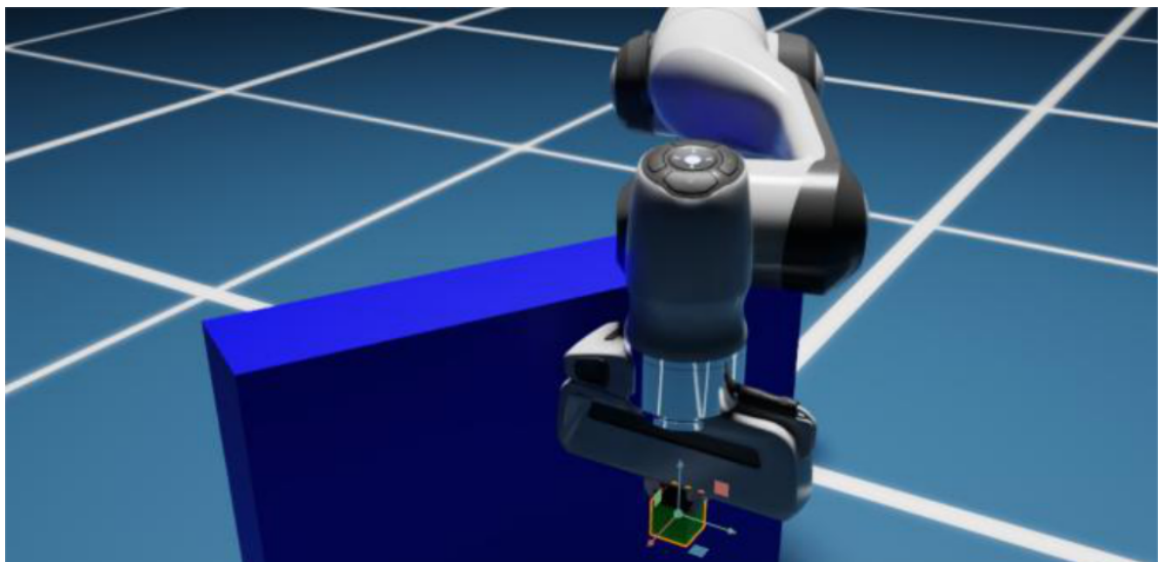


#03_LEGO



Context

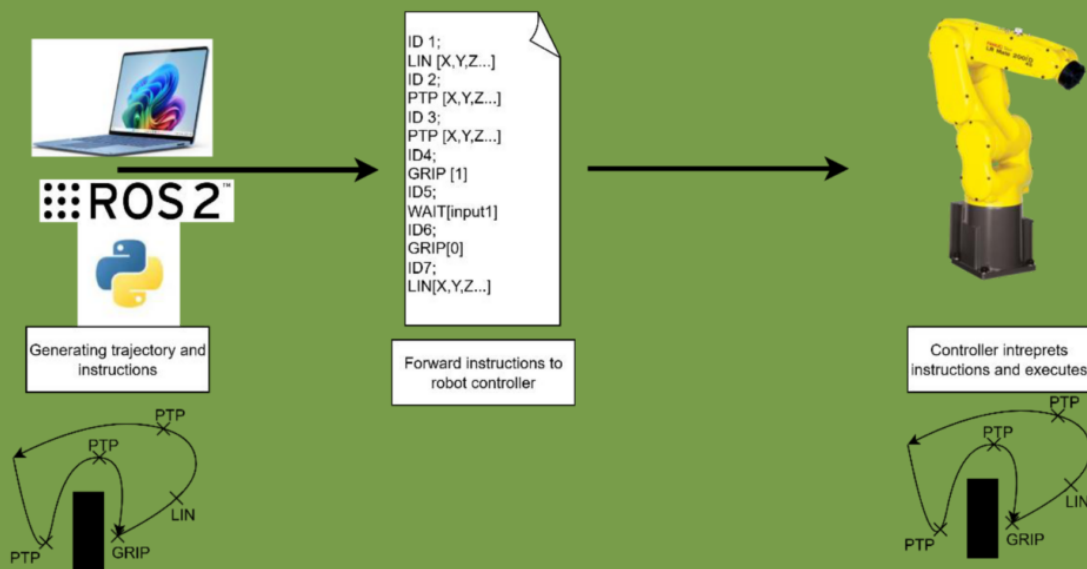
The LEGO Group specializes in producing iconic building toys that inspire creativity and learning. As part of our commitment to innovation, we are exploring advanced automation solutions to enhance efficiency in our processing area. This challenge focuses on optimizing the task of planning for industrial robots, enabling them to handle diverse elements with as little as possible programming time, ultimately supporting our mission to deliver high-quality products efficiently.



Challenge

The challenge involves automating the task planning for a 6-axis industrial robot used in a high variation pick-and-place application. Currently, engineers manually generate instruction files for each task, which is time-consuming and limits scalability. Participants will develop a system that automatically generates these instruction files from high-level task descriptions, using provided grasp poses and a ROS2-based control framework. The goal is to create a pipeline that plans collision-free robot motions and outputs structured instruction files, enabling the robot to perform tasks efficiently without manual intervention.

The main focus areas will be level of autonomy and a understanding of the sim to real gap.



Materials provided by the company

Participants will receive CAD data for the workcell, grippers, and elements, along with a specific robot model (URco-bot and/or KUKA KR6). A ROS2-based control framework will be provided, pre-configured with MoveIt2 for motion planning. Grasp poses for each element will be supplied to focus the challenge on path and task planning. Additionally, sample task descriptions and instruction files will be

available to guide development.

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