

Automatically Created HMI for Modular Robotics

Bachelorthesis

This thesis aims to implement automatic HMI generation for modular robotic systems

Motivation

In today's fast-paced manufacturing environment, modular robotics offer a compelling solution to address the challenges of short production life cycles and increasing product variations. These adaptable systems can be quickly reconfigured to accommodate new designs and production requirements, significantly reducing downtime and enhancing flexibility.

However, the complexity of combining different robot modules necessitates an advanced Human-Machine Interface (HMI) that can be automatically created to ensure seamless operation and integration. The automatic generation of HMIs is crucial for managing the intricate interactions between modules, allowing operators to monitor and control systems with ease. This approach minimizes the manual effort required to design and update HMIs, reducing the potential for errors.

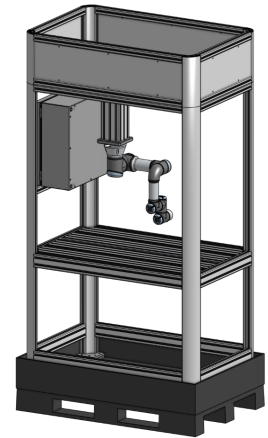


Abbildung 1: Robot Module

Aims

The aim of this thesis is to conduct an analysis of current Human-Machine Interface (HMI) methods and implement an automatically created HMI for modular robot systems. This implementation will utilize the Robot Operating System 2 (ROS2) and RViz within a server-client infrastructure.



Abbildung 2: ROS2

Helpful prior knowledge




-  Knowledge about robotic systems
-  Knowledge about ROS2 and RViz
-  Lecture Cyber-Physical Production Systems



Abbildung 3: RViz



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