University of Stuttgart
Germany

SUPER – Stuttgart University Program for Experiencing Research
Project Information

Institute's Information

Name of Institute	Institute of Construction Materials (IWB)
Contact Person	Jun.-Prof. Dr.-Ing. Anja Lauer
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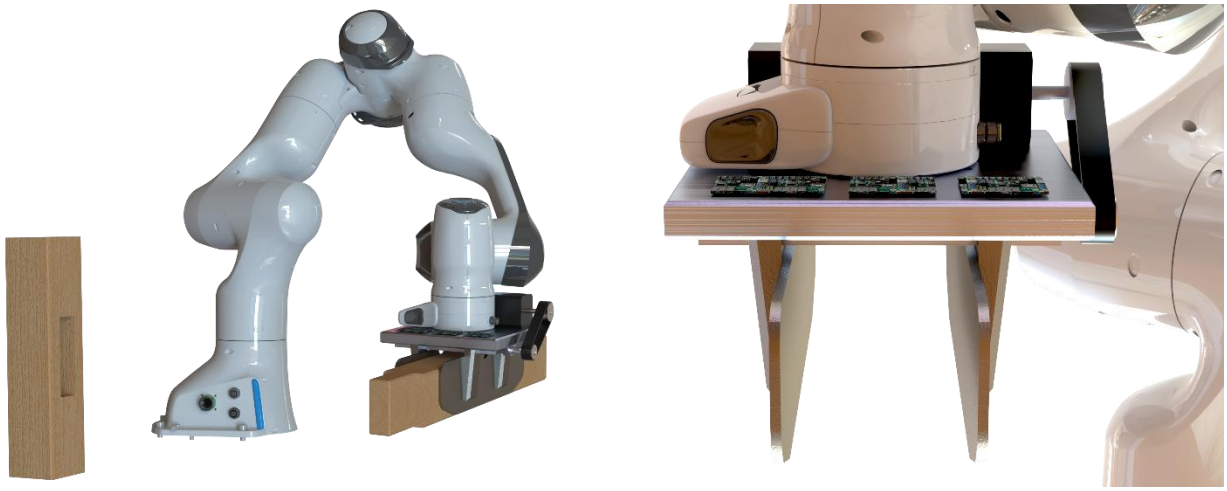
Duration of Project/Number of Students

June/July	X
June/July/August	X
Number of Students	1

Name of Project Construction site of the future: Development of a ROS software architecture for a gripper for the automatic framing of truss elements

Beneficial Skills & Knowledge High level of self-motivation and willingness to familiarize yourself with new topics, Knowledge of programming, Basic knowledge of working with Arduino

Description of Work



Automation on construction sites is key to increasing efficiency, safety, and sustainability. Intelligent robot systems that can perform complex assembly tasks are a crucial component of this. This work lays the software foundation for such an intelligent gripper.

The core task is to develop the software for controlling the gripper of a Franka Research 3 robot, whose hardware is based on an ESP32 microcontroller with separate subsystems for sensors and actuators. You will design and implement the communication protocols, both for internal data exchange between the subsystems and for connecting the gripper to an external computer. The main focus is on complete integration into the **Robot Operating System (ROS)** so that the gripper acts as an independent ROS node. This node should publish sensor data such as interaction forces and receive control commands via ROS topics or services. This project offers an excellent, practice-oriented opportunity to gain in-depth experience in modern robotics software development.