Project Number: 11

Project Title: Web Interface for Hugging Motion Control of a Human-like Robot

Project Clients: Francisco Cruz Naranjo, Mahdi Bamdad

Project specializations: Software Development;Web Application Development;System/game Development;Computer Hardware and Networks;Robotics;Computer Vision;Human Computer Interaction (HCI);Mobile Application Development;

Number of groups: 2 group

Main contact: Francisco Cruz Naranjo, Mahdi Bamdad

Background:

Human-robot interaction is crucial for humanoids. Our Baxter robot operates through ROS1 (Robot Operating System) commands, precisely controlling its arms. Currently, students are working on interaction projects, and enabling Baxter to give hugs as an example of interaction has been discussed and implemented. Our next step is to enhance its perception by adding sensors, such as advanced vision capabilities, within a new user-friendly interface.

Requirements and Scope:

This project involves understanding the development tools for robot programming in a corporate environment. It includes assembling and programming a Baxter robot kit, developing a ROS-based web app, and applying advanced ROS concepts to control the robot motion within a containerized environment using continuous integration.

Required Knowledge and skills:

- Design and equip the robot with advanced sensors
- Software should allow real-time operation of robot's hardware including arms and sensors.
- It should support ROS for robot navigation, perception, and control.
- The software could be containerized (e.g. Docker) and development tasks should be automated (e.g. Jenkins).
- Check the integrity of the code (e.g. Continuous integration)
- Testing and validation to ensure the robot's performance meets safety and functionality.

Expected outcomes/deliverables:

The project results in a safe robot that gives you the perfect hug. Wrapping its dexterous robotic arms around you with none of the squeeze.

- Documentation: Detailed documentation of the software, including web interface.

- Containerized Environment and CI: Docker containers for the software and continuous integration pipeline.

* The project scope can be adjusted based on the group size. Don't worry about the large scope—we'll make sure everyone can contribute effectively.