

Team-Project proposal: Telepresence with miniature humanoid robot: Microboy

Short Description

Development & integration of a telepresence driver for a miniature humanoid robot

Introduction

Telepresence – the anthropomimetic transfer of action, sensing and presence of a human to a robot – is seeing increasing interest with the deployment of modern communication technologies such as 5G and Starlink. Allowing to transfer any human skill to remote or dangerous location promises solutions from care to industry. We are offering a team project integrating and optimizing our telepresence stack into a miniaturized version of our humanoid robot Roboy 3.0, as a training, learning and demonstration platform for its full-sized brother.

Application Scenario



[Devanthro GmbH – the Roboy Company](#) is competing in the ANA Avatar XPRIZE – a world-wide competition with a \$10M prize purse that aims to create an avatar system that can transport human presence to a remote location in real time. Devanthro, along with other 77 best robotics teams worldwide, is developing a telepresence system (Fig. 1) that consist of a humanoid robot Roboy 3.0 and an operator suit. Currently, Devanthro's solution allows for transmitting visual, audio and motion modalities between the avatar and the operator (see [video](#) for demonstration), sending tactile and haptic feedback is currently in development. Since the full robot is a complex mechatronic system we are currently building a miniature version to allow users to experience telepresence at a fraction of the cost of the full system.

Goal & Tasks

The main goal is to integrate the electronics into the miniaturized Roboy 3.0 and connect it to our current telepresence app using a Jetson Nano. Embed a speaker, microphone and servos to move the robot, as well as cameras in the hardware. Update our Unity app to handle the new robot target.

The final tasks depend on the skillset of the team and can include a subset of the previous.

Prerequisites (team should cover):

- Python/C++
- Basics of signal processing
- Experience with ROS
- Unity development
- Android development

Supervisors:

Rafael Hostettler, Devanthro GmbH (rh@roboy.org)

Alona Kharchenko, Devanthro GmbH (unicorn@roboy.org)

Character

- Student team project
- Bachelor thesis (BA)
- Master semester project (SA)