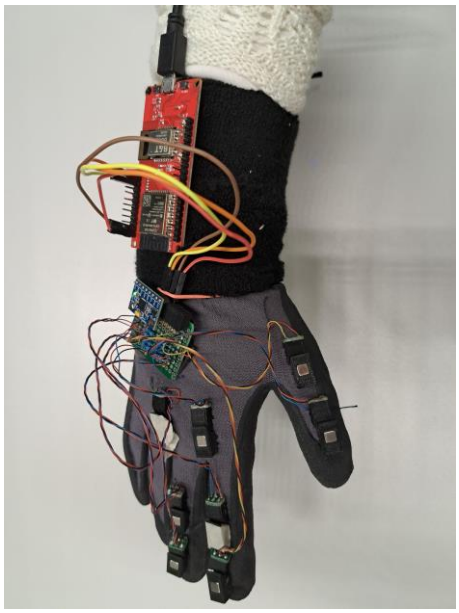
Graz University of Technology
Institute of Technical Informatics
Cognitive Products

Tactile Internet and Haptic Feedback for Hand-Gesture Recognition

In this project, the student should help us in developing a system that detect hand movements e.g., finger-bent, hand position, alignment, orientation, and position in the room. Furthermore, this should be transferred and replicated to a robot imitating the hands-movements, and detecting and measuring the resistance e.g., when grasping objects or touching surfaces. This resistance should be backpropagated to the human user to “feel” the objects remotely, in some form of haptic force-feedback.



The Cognitive Glove. Image Credit: Iris Unterkircher, Pro²Future

With the Cognitive Glove, we want to remote-control a robotic hand. Generated with AI (MS Copilot Designer)

Goal and Tasks:

- Development of a robotic hand-replica.
- Gesture and Position detection of hands (either visually or using some kind of sensors e.g., accelerometer, gyroscope)
- Forwarding control commands of the hands to the robotic replica.
- Detecting resistances using special sensors on the robotic hand.
- Backpropagation the resistances using haptic force-feedback actuators on the human side.

Recommended Prior Knowledge:

- Basic programming skills, such as Python, C, or C++.
- Experience in robotic applications.
- Experience in sensor hardware, as well es embedded systems.

Start: a.s.a.p.

Duration: 6-12 months

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