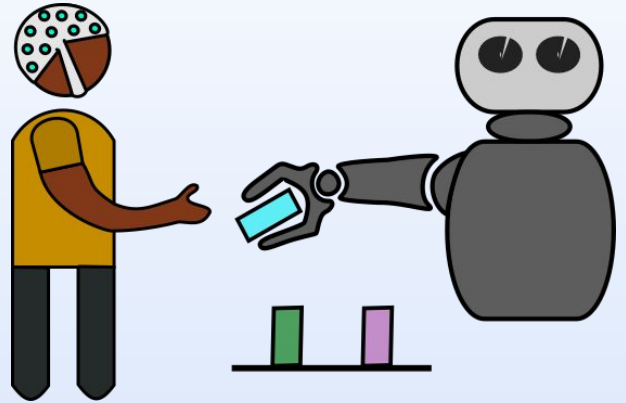


Multimodal Learning for Human-Robot Interactions and Robot Control

We are offering an exciting project for a Master Thesis in the field of Brain-Computer Interfaces and Robotics at Klaeslab, Ruhr University Bochum. The project will be part of the NEUROCOBOTS project for developing a brain-machine interface (BMI) for naturalistic human-robot collaboration.

About the Neurocobots project:

The project is jointly developed by Ruhr-University Bochum, Ruhr University for Applied Sciences, University of Coimbra, Institute for Systems and Robotics and University of Madeira, together with international partners. The aim of the NeuroCobots is to explore a novel way for efficient and adaptive human-robot collaboration. Studying the role of anthropomorphism and developing a BMI for fast detection of cobot related action errors will be the main part of the Neurocobots project.



Info about the Master Project

The Master thesis project will be split into two parts, offering two Master students the ability to work on the research project in a collaborative fashion

Master thesis part 1: Development of Virtual Reality scenarios and recording human biological signals (EEG, EMG, motion tracking and eye-tracking) during human-robot interactions. Recordings will take place at the lab of Prof. Christian Klaes, Knappschaftskrankenhaus Bochum) with an option to conduct them at our partner lab (Coimbra, Portugal).

Master thesis part 2: Development of a multi-modal decoder to learn interrelations across simultaneously data streams and detect markers for cobot related action errors.

!!!! Only Master Thesis Part 2 is still available !!!!

Starting Date: January 2023

Duration: 6 - 11 months (your examination regulations)

Location: KlaesLab, Knappschaftskrankenhaus,
In d. Schornau 23-25, 44892 Bochum

Contact: Marita Metzler

How to apply?

Write a Mail to (marita.metzler@ruhr-uni-bochum.de) with your motivation and a short description of your working experiences and skills related to that offer.

Who are we searching for?

We are searching for students with moderate machine learning background and knowledge in Python programming, preferably using deep learning libraries like Pytorch or TensorFlow. If topics like Brain-Computer Interfaces, Neuroscience or Human-Robot collaboration catch your interest, you are the right one for that project!

What do we expect from you?

Since the two projects are highly dependent on each other, both Master students have to carry out their thesis with an overlapping time frame and tightly collaborate with each other. You should be able to self-organize regular catch-up meetings with your colleague and establish a good communication workflow. And of course have some fun with your research.

Requirements in short:

- good programming skills
- experience in handling (large) data sets
- background in machine learning techniques, preferably deep learning approaches
- good communication skills
- willingness to learn basics in EEG data analysis and other modalities such as motion data and eye data.