

# DC2: Multimodal Tactile Data Communication for Touch-enabled Tactile Internet

Application deadline: 28-02-2023 | Date of enrolment: 1-9-2023

## Project description

This project focuses on haptic communication for local processing and controlling of haptic data in teleoperation systems, aiming at optimizing the transmission strategy for networked teleoperation while ensuring system stability and high fidelity. Due to the limited network resources, it is essential to investigate signal representations and develop corresponding compression schemes that exploit the properties and conceptual limitations of haptic information.

This position focuses on tactile data processing. Achieving high fidelity of tactile experience requires three main components: (i) efficient acquisition of tactile object properties, (ii) analysis and compression of tactile information, and (iii) tactile display technology. To this end, novel tactile codecs that support multiple touch points and multimodal signals with high compression rate and transparent touch impressions will be developed. In addition, psychophysical observations are required to reduce the necessary temporal and spatial resolution for transmitting tactile properties over a network. Going beyond the state-of-the-art it requires a multidisciplinary approach combining expertise from haptics, communication, source coding, protocol design, control theory and psychophysics.

## Eligibility Conditions

- Master's degree in electrical/computer engineering, mechatronic engineering or within a relevant area.
- The candidates are eligible if they have not resided in Germany for more than 12 months within the past 36 months.

## Required Skills

- Profound knowledge on signal processing and robotics.
- Experience in haptic technology and/or haptic applications
- Excellent knowledge of English (written and spoken).
- Knowledge of digital audio and image processing, machine learning, and embedded system design is a plus
- Be able to work well and communicate expert knowledge in an interdisciplinary team.

## How to apply:

Please send your application to Prof. Eckehard Steinbach [eckehard.steinbach@tum.de](mailto:eckehard.steinbach@tum.de) and Dr. Xiao Xu [xiao.xu@tum.de](mailto:xiao.xu@tum.de).

