

The Chair of Theoretical Information Technology has an immediate opening for a

## **Bachelor/Master Thesis, Research Internship, IDP: Robot Control for 6G Sensing-Assisted Secure and Robust Communication**

Within the 6G-life project, transmission systems that go beyond Shannon's communication approach are to be developed, in order to achieve a more secure, efficient, and resilient communication in novel 6G systems. It has been shown that transceiver architectures employing an additional sensing unit along with traditional communication aid in achieving these objectives. Our goal is thus to propose and implement practical schemes, which we subsequently demonstrate using our setup of mobile robots and unmanned aerial vehicles (UAVs). For this, key technologies such as multi-user-MIMO (MU-MIMO), machine learning, software-defined radio (SDRs), and distributed control are indispensable.

### **Content of the project and areas of responsibility**

- Research into the area of algorithms for distributed control/reinforcement learning.
- Development of a ROS-based framework for such algorithms.
- Integration into our setup of six robots and subsequent performance analysis.
- Interfacing and communication with our National Instruments (NI) software-defined radios.

### **Your qualifications**

- Currently enrolled in electrical engineering, communications engineering, computer science, physics or similar.
- Good knowledge in at least one of the following subjects: system and control theory, robotics, communications engineering, algorithms, and data structures.
- Hands-on programming skills in one of the following languages: MATLAB, Python, and C/C++.
- Familiarity with ROS, Linux systems, GPU programming, and topics such as robotics, reinforcement learning, MIMO systems and communication standards (LTE, 5G-NR) is a plus.
- Goal-oriented, independent, and structured work style

**To apply just send an e-mail to [vlad.andrei@tum.de](mailto:vlad.andrei@tum.de) with the subject "6g-edge". Make sure to add your latest transcript of records and a short description of yourself!**

### **General Information**

TUM is aiming to increase the number of women employees, and applications from women are expressly welcomed. People with disabilities, with essentially the same suitability and qualification, will be preferred. As you apply for a position at the Technical University of Munich (TUM), you provide personal data. Please note our data protection information according to Art. 13 Data Protection Basic Regulation (DSGVO) on the collection and processing of personal data in connection with your application <http://go.tum.de/554159>. By submitting your application, you confirm that you have taken note of the data protection information of the TUM.

### **Technical University of Munich**

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