Chair of Theoretical Information Technology
Department of Electrical and Computer Engineering
Technical University of Munich

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

Bachelor/Master Thesis, Research Internship, IDP: Edge Computing and Sensor Fusion 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) as well as edge computing, and embedded systems design are indispensable.

Content of the project and areas of responsibility

- Improvement of an already existing edge computing node consisting of RaspberryPIs, NVIDIA Jetson GPUs, and National Instruments (NI) software-defined radios.
- Conception, planning, and implementation of a sensor fusion framework interfacing above computing units with cameras, radar and LIDAR sensors.
- Writing of unit-, integration- and end-to-end tests.
- Practical implementation using our setup of six mobile robots and subsequent performance analysis.

Your qualifications

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

To apply just send an e-mail to 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.

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Chair of Theoretical Information Technology
Prof. Holger Boche
Theresienstrasse 90, 80333 Munich
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