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

Munich, January 2026

The Chair of Theoretical Information Technology at TUM offers a position as

Research Associate / PhD Student (f/m/d)

Implementation of Resilience Strategies for ISAC Systems and Hardware Demonstrator Development

Integrated Sensing and Communication (ISAC) systems are becoming a key enabling technology for next-generation wireless networks. However, these systems are particularly vulnerable to intentional interference and jamming attacks. This PhD position is part of a larger research project focused on developing resilient ISAC architectures. This project aims to implement, test, and demonstrate resilience strategies that enhance ISAC system robustness against various types of jamming.

You will design, implement, and analyze ISAC resilience strategies using advanced simulation tools. Specific tasks include:

- Implementing ISAC resilience strategies derived from theoretical work (e.g., waveform design, resource allocation, adaptive sensing approaches).
- Simulating ISAC systems under various jamming scenarios (single-tone, multi-tone, frequency-hopping, pulse, and arbitrary jamming).
- Using MATLAB and tools such as the Remcom Ray Tracing Suite to model realistic propagation environments.
- Implementing selected resilience strategies on software-defined radios (SDRs) or vector signal transceivers with up to 4 GHz instantaneous bandwidth.
- Using the digital twin assisted ISAC framework available at the TUM ACES Lab.
- Conducting real-world experiments to analyze performance deviations between theoretical models, software simulations, and hardware behavior.
- Working closely with partners at TUD on performance analysis and validation.

To be qualified for this position, you should have

- Excellent master's degree in Electrical Engineering, Communications Engineering, or a related field
- Strong knowledge in wireless communication systems, signal processing, or radar systems
- Proficiency in at least one programming language (e.g. Python)
- Interest in hands-on experimentation and hardware prototyping

The following points are considered a bonus

- Experience with SDR platforms (e.g., USRP, NI VST, Ettus devices)
- Experience with spectrum analyzers or signal generators
- Knowledge of jamming, interference modeling, or secure communication techniques
- Familiarity with ray-tracing tools or channel modeling software

Our offer

- Access to state-of-the-art lab facilities at the TUM ACES Lab
- Collaboration with leading researchers at TUM and TUD
- Opportunity to contribute to cutting-edge ISAC research with real-world impact
- A dynamic, international research environment and support for publication at top conferences/journals
- Subject to personal qualifications, employees are remunerated in salary group E 13 TV-L

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How to apply

Please send us your application by e-mail (jobs.lti.cit@tum.de with "RESILIENCE" in the subject line), including the following documents:

- CV, copies of relevant certificates and diplomas (or transcript of records if not yet finished)
- Short description of your research interests and your motivation for the application
- Master thesis and up to 3 publications (if available)
- Contact information for two references

General Information

The Technical University of Munich (TUM) is aiming to increase the number of women employees, and applications from women are expressly welcomed. Applicants with disabilities, with essentially the same suitability and qualification, will be preferred. As you apply for a position at TUM, you will 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.

Contact

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