

Technische Universität Dresden (TUD), as a University of Excellence, is one of the leading and most dynamic research institutions in the country. Founded in 1828, today it is a globally oriented, regionally anchored top university as it focuses on the grand challenges of the 21st century. It develops innovative solutions for the world's most pressing issues. In research and academic programs, the university unites the natural and engineering sciences with the humanities, social sciences and medicine. This wide range of disciplines is a special feature, facilitating interdisciplinarity and transfer of science to society. As a modern employer, it offers attractive working conditions to all employees in teaching, research, technology and administration. The goal is to promote and develop their individual abilities while empowering everyone to reach their full potential. TUD embodies a university culture that is characterized by cosmopolitanism, mutual appreciation, thriving innovation and active participation. For TUD diversity is an essential feature and a quality criterion of an excellent university. Accordingly, we welcome all applicants who would like to commit themselves, their achievements and productivity to the success of the whole institution.

At the **Faculty of Electrical and Computer Engineering, Institute of Communication Technology**, the **Vodafone Chair of Mobile Communications Systems** offers three positions as

Research Associate (m/f/x)

(subject to personal qualification employees are remunerated according to salary group E 13 TV-L)

starting at the **earliest possible date**. The positions are limited for two years. The period of employment is governed by the Fixed Term Research Contracts Act (Wissenschaftszeitvertragsgesetz-WissZeitVG). Balancing family and career is an important issue. The positions are generally suitable for candidates seeking part-time employment. Please indicate your request in your application. The positions offer the chance to obtain further academic qualification.

The Vodafone Chair of Mobile Communications Systems offers the opportunity to help shape the development of future mobile communication systems in a prosperous and dynamic environment, to gain valuable project experience and to establish and deepen contacts with innovative companies. Further information on the Vodafone Chair can be found at <https://mns.ifn.et.tu-dresden.de/>.

Tasks: You will conduct research in the field of wireless communications technology **on one** of the following topics:

- 1) System simulation and development of solutions for remote rendering augmented reality applications in cooperation with Meta.
- 2) Development of beam forming and beam selection strategies/algorithms for communication with large antenna arrays at D-band frequencies (110 – 170 GHz) for 6th generation mobile networks. Characterization of the performance of training and adaptation algorithms for channel estimation and beam alignment.
- 3) Development of channel estimation and synchronization algorithms for terabit wireless communication systems with temporally oversampled 1-bit quantization. Analysis of the impact of distortions by the analog frontend and sampling jitter on the communication performance.
- 4) Development and evaluation of resilient wireless systems with applications e.g. in medicine or industry. Topics include traffic modelling, spectrum and interference sensing (incl. prediction), radio resource allocation, network optimization and interface diversity. Approaches comprise machine learning-based as well as model-based methods.
- 5) Development of waveforms and signal processing algorithms (model based and AI/ML) for joint communications and sensing. Topics include flexible waveform and frame multiplexing, channel and hardware modeling, and high-resolution parameter. Evaluation of the developed schemes in different use cases, such as beamforming, localization, and imaging.

- 6) Design and evaluation of novel ultra-wideband radio access technologies for wireless communications in frequency bands above 100 GHz to achieve ultra-high data rates. Exploration of high-gain beamforming architectures and beam management. Development of hardware-aware waveform and receiver algorithms. Analysis, simulation, and evaluation of the developed techniques in a proof-of-concept demonstration on realistic hardware platforms.

Requirements: above-average university degree in the field of computer science, electrical engineering, communications engineering or information systems engineering, physics, mathematics or similar; profound knowledge of wireless communications, communications engineering, and digital signal processing; independent, goal- and solution-oriented approach; integrative and cooperative behavior with very good communication and social skills; confident command of written and spoken English. Mathematical skills, especially in the areas of modelling and simulation; programming experience with Matlab, Python or C++, or knowledge of hardware implementation are advantageous. TUD strives to employ more women in academia and research. We therefore expressly encourage women to apply. The University is a certified family-friendly university and offers a Dual Career Service. We welcome applications from candidates with disabilities. If multiple candidates prove to be equally qualified, those with disabilities or with equivalent status pursuant to the German Social Code IX (SGB IX) will receive priority for employment.

Please submit your comprehensive application including the usual documents under the **job ID "w23-019"** by **February 21, 2023** (stamped arrival date of the university central mail service applies), preferably by sending it as a single pdf-document to jobs@ifn.et.tu-dresden.de (Please note: We are currently not able to receive electronically signed and encrypted data) or to: **TU Dresden, Fakultät Elektrotechnik und Informationstechnik, Institut für Nachrichtentechnik, Vodafone Stiftungsprofessur für Mobile Nachrichtensysteme, Herrn Prof. Gerhard Fettweis, Helmholtzstr. 10, 01069 Dresden, Germany**. Please submit copies only, as your application will not be returned to you. Expenses incurred in attending interviews cannot be reimbursed.

Reference to data protection: Your data protection rights, the purpose for which your data will be processed, as well as further information about data protection is available to you on the website: <https://tu-dresden.de/karriere/datenschutzhinweis>.