

## **Faculty of Electrical and Computer Engineering**

At the **Institute of Communication Technology**, the **Vodafone Chair of Mobile Communications Systems** is offering three positions as

### **Research Associate (m/f/x)**

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

at the **earliest possible date** limited for 2 years with the option of extension. The period of employment is governed by the Fixed Term Research Contracts Act (Wissenschaftszeitvertragsgesetz-WissZeitVG). The positions offer the chance to obtain further academic qualification (PhD). 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 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://www.vodafone-chair.org/>.

**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.

All tasks are carried out in cooperation with partners from industry and science. The field of activity also includes the supervision of student work related to the research topics. The results of the work are to be published at international conferences and in recognized journals.

**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.

Applications from women are particularly welcome. The same applies to people with disabilities.

Please submit your comprehensive application including the usual documents, mentioning the research topics you are interested in, by **August 2, 2022** (stamped arrival date of the university central mail service applies) to: **TU Dresden, Fakultät Elektrotechnik und Informationstechnik, Institut für Nachrichtentechnik, Vodafone Stiftungsprofessur für Mobile Nachrichtensysteme, Frau Carolin Bauder, Helmholtzstr. 10, 01069 Dresden, Germany** or by sending it as a single pdf-document to [jobs@ifn.et.tu-dresden.de](mailto:jobs@ifn.et.tu-dresden.de) (Please note: We are currently not able to receive electronically signed and encrypted data.). Please submit copies only, as your application will not be returned to you. Expenses incurred in attending interviews cannot be reimbursed.

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**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>.