Am **Vodafone Stiftungslehrstuhl für Mobile Nachrichtensysteme** der Technischen Universität Dresden wird zum nächstmöglichen Zeitpunkt für die Tätigkeit einer

studentischen Hilfskraft (max. 15 h/Woche)

zunächst befristet bis 31.03.2025 ein/e Student/in gesucht (Beschäftigungsdauer gem. WissZeitVG).

Problem Statement

Future generations of wireless networks will enable various new use cases in industry, for instance mobile robots and human-machine-cooperation. However, because of the open nature of the transmission medium, wireless networks are susceptible to performance degradation due to unexpected interfering signals. Such interference can be caused unintentionally, for example by misconfigured devices, but also intentionally, referred to as jamming.

To enable effective countermeasures against unexpected interference, it is essential to constantly monitor the spectrum and detect anomalies, i.e., interfering signals, which might affect the network performance. For this reason, a new approach for high-fidelity spectrum anomaly detection has been developed which employs a digital twin and detects anomalies based on deviations between the real world and the digital twin [1].

The approach has been investigated experimentally as well, with a focus on the channel frequency response [2]. However, in the current status of the work, the digital twin is mimicked by further measurements. The task of this position to implement a digital twin based on ray tracing simulations using the Python module Sionna and evaluate the performance in the implemented framework. After the successful implementation, further investigations can be executed, e.g., on increasing the resilience of the approach against model errors in the digital twin.

Expected Skills

- Interest in wireless communications systems
- Solid programming skills in Python
- First experience with TensorFlow is a plus
- Basic understanding of wireless communications systems, particularly of the wireless channel

Contact Person

Anton Schösser (anton.schoesser@tu-dresden.de)

For the application, please send a CV and a recent transcript of records. Please also describe shortly your experiences which might be helpful in this position.

Do not hesitate to contact me if you have further questions on the task or if you are not sure whether you meet the required skills. I'm looking forward to your application.

Recommended References

[1] A. Schösser, F. Burmeister, P. Schulz, M. D. Khursheed, S. Ma and G. Fettweis, "Advancing Spectrum Anomaly Detection through Digital Twins," in *IEEE Communications Magazine*, doi: 10.1109/MCOM.001.2400221. Link

[2] A. Schösser, F. Burmeister, P. Schulz and G. Fettweis, “Leveraging the Digital Twin Channel for Spectrum Anomaly Detection: An Experimental Study,” in Proceedings of 2025 IEEE 5th International Symposium on Joint Communications & Sensing (JC&S 2025), Oulu, Finland, Jan 2025. Link

Frauen sind ausdrücklich zur Bewerbung aufgefordert. Selbiges gilt auch für behinderte Menschen.

Bewerbungsunterlagen werden nicht zurückgesandt, bitte Kopien einreichen. Vorstellungskosten können leider nicht übernommen werden.