PhD position: Drones in Cellular Networks

The Networked and Embedded Systems Institute (https://nes.aau.at/) at the University of Klagenfurt, Austria (https://www.aau.at/) offers an exciting PhD position in drones in cellular networks. The project is funded by the Austrian Science Fund, FWF, and the successful candidate will be co-supervised by Prof. Christian Bettstetter and Dr. Aymen Fakhreddine.

Project description

The ambition of this project is to establish a theoretical framework to integrate drones as aerial users into 5G cellular networks. The targeted breakthrough is to ensure that, when connected to current cellular networks, drones support data transmissions at very high data rates in the uplink, while the downlink connectivity remains ultra reliable for remote control and steering. The primary objectives are the design of novel algorithms and techniques for handover management and interference mitigation for these aerial users, and the definition of a realistic simulation scenario to analyze the end-to-end latency of command data transmissions from a ground controller to a drone via 5G in the vision of setting foundations for beyond visual line-of-sight drone operations and multi-drone systems. Our approach is to bridge the gap between theory and practice by focusing on problems encountered in real-world scenarios, on realism in our modelling and simulation work, and on theoretical approaches that will subsequently help engineering cellular networks for new applications. The level of originality of this project resides in the design of innovative mechanisms that would make the integration of aerial user equipment possible without impairing ground users for which these networks were primarily deployed.

Requirements

- Master of Science degree in Telecommunications, Electrical Engineering, or related areas relevant to the PhD topic.
- Strong knowledge in wireless communications and networks.
- Proficiency in MATLAB or similar.
- Willingness to perform experimental work related to wireless systems and small drones.
- Proficiency in English (both spoken and written). Please note that German is not required.
- Excellent communication, initiative, and self-management skills.

Doctoral candidate

As per FWF regulation, the doctoral candidate will work on a basis of *30 hours* per week fully dedicated to the research project. No teaching duties are required. The monthly gross salary fixed by FWF for this position is **2,300.30** Euros paid **14** times per year (annual gross salary = 32,204.20 Euros). The position comes with additional employer's contributions to social and health benefits. The position is **36 months** long and the targeted starting date is **August 1st, 2022**.

How to apply

Please apply no later than **June 30th, 2022**, by sending the following documents directly to aymen.fakhreddine@aau.at. The same email address can be used for any question related to this PhD position. Please start the email subject with [FWF PhD position].

- Curriculum vitae including a list of publications if any.
- A motivation letter that shows the applicant's interest in the PhD topic.

Employer

The University of Klagenfurt, with approximately 1,500 employees and over 12,000 students, is located in the Alps-Adriatic region and consistently achieves excellent placements in rankings. The motto "per aspera ad astra" underscores our firm commitment to the pursuit of excellence in all activities in research, teaching and university management. The principles of equality, diversity, health, sustainability and compatibility of work and family life serve as the foundation for our work at the university.

The University of Klagenfurt has a 15-year outstanding record on drone research (https://uav.aau.at/) and hosts an internationally recognized drone hub with unique infrastructure as part of the university's long-term key research area "networked and autonomous systems." Although AAU's Faculty of Technical Sciences is just 15 years old, it recently placed in the top 15 in the DACH region (DEU, AUT, CHE) in the 2022 Times Higher Education Ranking in the overall field of Engineering.