Chair of Information Theory and Data Analytics | RWTH AACHEN UNIVERSITY

Master Thesis / HiWi Job

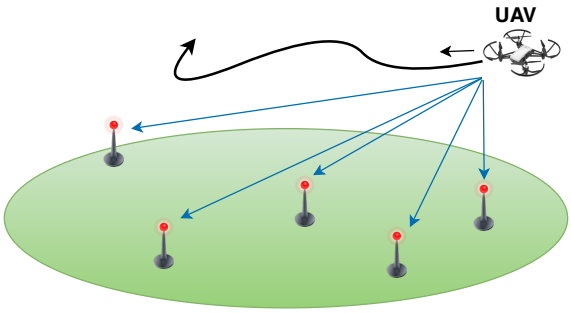
Efficient Trajectory Design for UAV-Assisted Wireless Communication Networks

Keywords

Efficient Design, Unmanned Aerial Vehicles (UAVs), Trajectory Design, Wireless Communications, Optimization Techniques.

Description

Nowadays, unmanned aerial vehicles (UAVs) have found abundant applications in, e.g., cargo delivery, aerial inspection and surveillance, due to the relatively high payload and long endurance. In 5G and beyond wireless networks, e.g., 6G networks, in accordance with the expanded requirements of data transmissions, UAVs have also been involved to facilitate the wireless communications. Thanks to the presence of line-of-sight (LoS) links between UAVs and ground devices, UAV-assisted wireless networks are likely to have better system performance than conventional terrestrial wireless networks. Besides, as different UAV deployment positions will lead to diverse service qualities, the trajectory design becomes critical for enhancing the overall network performance. For fully exploiting the high mobility of UAV, a joint resource allocation and network scheduling, together with UAV trajectory design will also be expected in the whole system design.



For an efficient system design, both the performance enhancement and the complexity reduction should be considered. In various wireless communication scenarios, e.g., with limited cache capacity at UAV or with wireless power transfer technology for supporting ground users, adaptive trajectory designs for UAV will be anticipated.

Goal

For the goal of this thesis/HiWi job, the student will be expected to review existing strategies for UAV trajectory designs and under guidance apply one of our proposed novel strategies for completing an efficient trajectory design. The proposed design will be validated by numerical simulations.

Requirements

- Basic knowledge in optimization techniques (highly recommended)
- MATLAB programming skills
- Self-motivated and work efficiently

Contact

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