Efficient System Design in UAV-Assisted Wireless Networks

Keywords

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

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 recent years, UAV-enabled wireless applications have also attracted increasing attentions, as UAVs can be used for the quick deployment of on-demand wireless systems. Thanks to the presence of line-of-sight (LoS) aerial-to-ground (A2G) wireless links between UAVs and ground devices, UAV-enabled wireless networks are likely to have better system performance than conventional terrestrial wireless networks. In general, in UAV-assisted wireless network, both the deployment position of UAV and the UAV trajectory are designed for a system performance enhancement. Besides, to fully deploy the mobility of UAV, a joint resource allocation together with UAV trajectory design is also preferred.

In system design, a most popular design strategy has been widely applied, in which the UAV trajectory is discretized in a time-division manner. However, this strategy has introduced a high complexity and an inaccuracy during trajectory quantization. For an efficient system design, in our previous work, we have proposed two novel strategies for UAV trajectory design, which have shown significantly low computation complexities.

Goal

As for the goal, the student will be expected to apply the existing strategies in various types of wireless networks and to complete an efficient system design based on these strategies.

Requirements

- Basic knowledge of wireless communications
- MATLAB/Python programming skills
- Motivation to learn new material and work efficiently

Contact

Xiaopeng Yuan, Room 331 (ICT Cubes), E-mail: yuan@isek.rwth-aachen.de