



Selected Areas in Communications

Aerial Communications

Symposium Co-Chairs

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Scope and Motivation

Aerial communications refer to communication to, from and with aerial nodes (such as manned and unmanned aircrafts, floating balloons, airships) with significantly higher altitude than their terrestrial counterparts. On one hand, those aerial nodes could be deployed as aerial base stations, relays, or access points, to provide wireless connectivity for ground users from the sky. Thanks to their appealing features such as wide coverage with elevated altitude, the ability of on-demand deployment and fast responses, aerial-assisted wireless communications have found many promising applications, such as data traffic offloading, public safety, disaster relief, information dissemination and data collection. On the other hand, aerial nodes with their own missions (such as package delivery, aerial photography, surveillance) may also be connected to ground networks as new aerial users. Network-connected aerial nodes are expected to not only enable their truly remote command and control (C&C) with unlimited operation range, but also to support their high-capacity payload communications.

However, aerial communications are significantly different from conventional terrestrial communications, due to the high altitude and/or high mobility of aerial nodes, the unique channel characteristics of air-ground links, the asymmetric quality of service (QoS) requirements for C&C and mission-related payload communications, the stringent constraints imposed by the size, weight, and power (SWAP) limitations of aerial nodes, as well as the additional design degrees of freedom enabled by joint aerial mobility control and communication resource allocation.

This newly established track aims to foster research and innovation surrounding the study, design and development of aerial communications. The track solicits original, previously unpublished papers pertaining to the theoretical and practical aspects of aerial communications.

Topics of Interest

Topics of interest for this symposium include but are not limited to the following:

- Networking architectures and communication protocols for aerial communications
- Theoretical frameworks for the analysis of aerial communications
- System-level simulation studies of aerial communications
- Channel measurement and modeling for air-ground and air-air links
- Spectrum management and multiple access schemes for aerial communications
- Interference mitigation for aerial communications
- Manned and unmanned aerial systems communication
- Aerial swarm communications and control
- Machine learning for aerial communications
- Massive MIMO/Millimeterwave/reconfigurable intelligent surface for aerial communications
- 3D aerial node placement and online/offline aerial trajectory/path optimization implications for communication
- Joint trajectory design and resource allocation for aerial communications
- Internet connectivity using aerial platforms
- UAV-supported emergency communications
- UAV-supported data offloading
- UAV-assisted mobile edge
- Integration of UAVs in 5G and 6G mobile networks
- UAV-assisted fast deployment of communication and networked services
- Energy consumption model and energy supplying methods of aerial communications
- Energy-efficient aerial communications
- Simultaneous wireless information and power transfer in aerial communications
- Cybersecurity and physical-layer security of aerial communications
- Virtualization and softwarization of UAVs and networks of UAVs
- Experimental performance demonstrations, prototyping, and field-tests of aerial communications
- Standardization progress
- Economical frameworks for aerial communications, e.g., cost studies, business models, etc.
- Regulatory schemes for aerial communications, e.g., safety operation, privacy protection, etc.

Important Dates

Paper Submission: 15 April 2022

Notification: 25 July 2022

Camera Ready and Registration: 1 September 2022

How to Submit a Paper

All papers for technical symposia should be submitted via EDAS. Full instructions on how to submit papers are provided on the IEEE Globecom 2022 website: <https://globecom2022.ieee-globecom.org/>