

Multi-UAV Systems

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Abstract:

This keynote speech will give an overview of the research work on multi-UAV systems (or: drone swarms) at AAU Klagenfurt, performed over almost a decade in the research focus area 'Networked and Autonomous Systems'. Several research groups from different AAU and associated institutes have been and are still involved in research on multi-UAV systems in various funded projects, including Horizon 2020; a doctoral school on 'Networked Autonomous Aerial Vehicles (NAV)' started in late 2017.

The presentation will initially cover the targeted (civilian-only) application areas of systems of multiple UAVs, ranging from first-responder support to delivery services, as well as the research topics that we addressed. The major components of multi-UAV systems -- UAV platform, sensing, coordination and communication -- will be introduced and some of our contributions will be highlighted. A focus of the talk will be on the significant challenges and on our research work on (air-to-air and air-to-ground) communication in multi-UAV networks. Finally, the objectives and the ongoing current research in the NAV doctoral school on autonomous 3D reconstruction and navigation will be presented.

Brief Speaker Biography:

Dr. Hermann Hellwagner is a full professor of Informatics with the Institute of Information Technology, Alpen-Adria-Universität (AAU), Klagenfurt, Austria, leading the Multimedia Communication Research Group. He has edited several books, and has authored over 250 scientific papers on parallel computer architecture, parallel programming, multimedia communication and adaptation, and multi-UAV systems. His research interests include distributed multimedia systems, multimedia communication, quality of service, information-centric networking, and multi-UAV communication. Dr. Hellwagner is a member of the IEEE, the ACM and the Austrian Computer Society (OCG). He received many research grants from national (Austria, Germany) and European funding agencies and industry. He served as a Vice President of the Austrian Science Fund (FWF, 2013–2016).