TITLE: On the Performance of Natural Interaction in Networked Human-Drone Teams

November 18th, 13:30 Aula A018 (Rizzi) and streaming to L6 Lab (CEPO)

ABSTRACT: Humans and drones may form teams with extraordinary capabilities to collaboratively solve tasks in 3D. Supporting systems need to integrate autonomous drone behaviour, drone learning, and human-drone interactions. In this talk, a distributed systems approach – separating basic drone activities and decision taking – will be described which allows to integrate vision-based navigation and natural interaction, as well as resource-intense machine learning. Experimental results will be discussed along two use cases: bookshelf scanning with gesture-based interaction and the use of human emotional facial feedback to provide a learning signal for drone reinforcement learning.

We employ off-the-shelf micro drones equipped with on-board cameras and Wi-Fi connectivity. To investigate the feasibility of using human emotion for drone learning, a user study with 27 participants has been conducted in an indoor lab setting. Our experimental approach confirms that a distributed architecture is feasible, yet vision-based recognition results in considerable interaction delays. Further, learning based on human emotion recognition is challenged by confounders with a clear negative impact on the reinforcement learning outcome.

BIO:

Karin Anna Hummel is an Associate Professor of Computer Science at JKU Linz, where she works on mobile networked systems and application fields such as networked drones, mobility-aware networking, and the IoT. Previously, she was a Marie Curie Fellow at ETH Zurich and a post-doc researcher at the University of Vienna. Karin Anna Hummel holds a habilitation from JKU Linz (2017) and a doctoral degree from Vienna University of Technology (2005). She has been in the organizing committee of numerous workshops and conferences and is the co-chair of the Austrian OCG working group NET-IT (Network Intelligence). Overall, 90+ publications document her research activities.

More information can be found at http://www.karinannahummel.info/