

Elektroakustik und Audiosignalverarbeitung 1

Experimenting with professional microphones to apply acoustic event detection to unmanned aerial vehicles

Oral presentation

Tuesday, March 22, 2022 | 4.20 pm | Room 47-03

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Unmanned aerial vehicles (UAV) are already being used today for a wide variety of tasks. For this purpose, UAVs are equipped with various sensors, such as video and thermal imaging cameras or flight assistance systems. Acoustic sensors, on the other hand, are not yet established, although they offer a wide range of possible applications in combination with AI-based signal processing. Using e. g., acoustic event detection could extend the sensing capabilities of UAVs and enable them to react automatically to user-defined acoustic events. Possible scenarios include finding an emergency location, autonomous flight to the event location, automatic monitoring of the acoustic environment, or triggering an alarm.

The acoustic sensor system required for this purpose must be robust to external environmental conditions, as it is inevitably subject to perturbations such as the air currents through the rotors, operational noise, or wind noise. In this work, we have investigated a set of commercially available microphones for their suitability for such an acoustic sensor system. The realization of acoustic event detection is based on linear support vector machines in addition with OpenL3-Embeddings. To train the acoustic sensor system, a dataset from the DCASE2020 challenge is extended with recorded noise to consider different use cases.