

## Investigation of acoustics characteristics of urban air vehicles

Type: Master Thesis  
Content: Numerical (with a small experimental part)  
Possible start: As soon as possible

## Assistant Professorship for Sustainable Future Mobility (SFM)

The professorship of Sustainable Future Mobility is part of the School of Engineering and Design and the Department of Aerospace and Geodesy at the Technical University of Munich. The focus of the professorship is computational and experimental research into advanced aircraft engines using alternative fuels as well as their impact on people and the environment. Findings in technical thermodynamics, from molecular pathways of pollutant formation to acoustics, form the basis for our contribution towards a more sustainable mobility.

### Project Description

The HOAMAT project investigates the automated guidance of emerging and smaller conventional aircraft in a defined airspace. A novel system is to be developed which plans and coordinates the flight trajectories of various air traffic participants. The goal is to verify the overall system capability, safety, and passenger and environmentally friendly aviation. SFM will provide a basis for assessing the impact of flight missions on the inhabitants of urban areas. To this end, various environmental impacts, including acoustic and visual factors, will be experimentally observed using several different air vehicles (unmanned/manned, semi/fully autonomous, and remotely piloted).



### Your Tasks

The focus of this thesis is to investigate noise emissions of UAVs. For this purpose, the following topics must be addressed:

- Noise measurement in literature.
- Identification of influencing factors and dependencies of noise emissions.
- Plan and execute a measurement campaign to generate suitable data.
- Evaluation and analysis of noise measurement data:
  - Consideration of weather data,
  - Consideration of various UAVs and flight maneuvers,
  - Consideration of ambient noise (integration of corrections).
- Investigation of flight log data in relation to the noise data.

### Our Requirements

- Interest in acoustics
- Experience with MATLAB
- Fluent oral and written German or English communication skills
- Independent work and planning
- Analytical way of thinking

### Contact

If you have questions or are interested in working with our team, please send your application to Katharina Donner ([katharina.donner@tum.de](mailto:katharina.donner@tum.de)).