Universität Bremen

BIMAQ
Bremer Institut für Messtechnik,
Automatisierung und Qualitätswissenschaft

:

Evaluation of Direct and Indirect Flow Sensing Methods Using Miniaturized Drones

Figure 1: Microdrones in natural wind environments (illustration).

Following the Wind – Measuring the Unknown?

Utilizing miniaturized drones for flow measurements extends the application areas and possibly enhances the measurement accuracy compared to larger drones due to the less distortion on the measuring flow. Flow velocity measurement from a drone can be done by direct or indirect measurements, which are associated with uncertainties. In order to minimize the uncertainties, various possible flow measuring methods need to be evaluated.

The aim of this thesis is to systematically investigate the performance of both direct and indirect flow sensing under different flow conditions. For direct flow measurement, external flow sensors need to be integrated into the drone and handle the acquired measurement data. Indirect flow measurement can be implemented as a drone´s position estimation with available decks for the drone, such as optical flow deck and multi-ranger deck.

Possible Contents

- Implement direct and indirect flow sensing on a mini drone
- Perform experiments under different flow conditions
- Quantify and compare measurement uncertainties

Your Profile

- Interest in experimental work, flow measurement, and drones
- Basic knowledge of data evaluation is an advantage
- Programming experience in Python, MATLAB, or similar
- Independent, structured, and motivated working style

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