

FAKULTÄT FÜR VERFAHRENS-UND SYSTEMTECHNIK

Masterarbeit Nr.: LSS-MXXX Aufgabenstellung für die Masterarbeit von: XXX (Matr.-Nr. XXX)

TITLE: Experimental investigation of an alternative propulsion system for drones

Battery-driven drones and UAVs are currently being developed for a variety of practical applications. It is expected that they will open the door for new technical possibilities and innovative applications leading to a highly profitable market. All existing prototypes show very similar, propeller-based systems to generate both ascensional and propulsion forces. This point should be challenged in the present project, based on a fully-equipped experimental setup provided by the industrial partner of the project. The central idea is to replace propeller-based solutions by the integration of centrifugal compressors to generate vertical forces. Centrifugal compressors can easily be built as lightweight devices. Combined with their excellent efficiency, this could possibly lead overall to a noticeable gain regarding the usefully transportable payload.



<u>Tasks:</u>

All this Master's Thesis will be based on experimental measurements using a set-up provided by the industrial partner.

- Joint design of the set-up and of its measurement equipment
- Identification of a suitable centrifugal compressor available off-the-shelf
- Design of a first diffusor for this compressor
- Supervision of construction of the set-up, done by the company of the industrial partner
- Installation and first operation of the set-up in the Lab
- Systematic measurement campaign
- Analysis of measurement data
- Conclusions of the study
- Possible future steps regarding in particular the diffusor
- Documentation

Supervision:

- Prof. Dominique Thévenin (ISUT/LSS)
- Dr.-Ing. Günter Scholz (movab-d GmbH Lauta), industrial partner

Beginning: **as soon as possible** Due: