



## Semesterarbeit/Masterarbeit

# Development of an embedded software framework for a redundant system architecture of an eVTOL

## Embedded Systems

### Description:

Looking for an enthusiastic and self-motivated student with strong background in software development for embedded systems. You will be developing efficient and modular low-level software for a flight control computer intended for use on a state-of-the-art conceptual electric hybrid UAV configuration. You will be participating and contributing in the joint development and analysis of a redundant fly-by-wire aircraft system architecture. The design of software tool is carried out on off-the-shelf available platforms (for example, ARM based microcontrollers like STM32). The selected MCU platform are to be configured with FreeRTOS. Development of drivers, API along with Hardware Abstraction Layers and communication protocols between multiple instances of the MCUs is to be performed. Additionally, interfacing with other peripheral aircraft components (like sensors, ESCs, servos, etc) through common communications like I2C, SPI, UART, etc. is to be achieved. You will also be involved with interfacing the embedded platform with model-based design software (Matlab/Simulink – widely being used in flight control development in the future air taxis) for further testing and debugging.

### Work packages:

- WP1: Design of Embedded Software framework structure
- WP2: Development of required drivers, APIs, HAL on FreeRTOS
- WP3: Toolchain for building the application software and flashing on the MCU.
- WP4: Demonstration of the interfacing with aircraft peripherals.
- WP5: Debugging and Testing
- WP6: Documentation

### Requirements:

- Excellent grades in embedded systems course
- Experience with electrical interfacing and PCB design is a plus
- Good knowledge and experience with embedded software development
- Self-motivated and ability to achieve given tasks independently

### Application:

- CV/Resume
- Grade sheets
- Short description of any previous experience (in ca. 4-5 sentences)

### Start: Immediately

