Interdisciplinary Project

Institute for Rotorcraft and Vertical Flight

Development of an Efficient Implementation of a New VTOL Concept Selection Methodology and Corresponding User Interface (1-2 students)

Keywords: VTOL, Concept Selection, Python, Programming, Database, User Interface

Background:
More and more start-ups and established companies, such as Airbus, Joby, Lilium, and Volocopter, are currently developing so called Vertical Take-Off and Landing (VTOL) aircraft for the future Urban Air Mobility (UAM) market. Many of these designs are short-lived or have to be drastically changed during development to fit market needs. A robust concept at an early stage is key to every development program including the VTOL designs.
To tackle this need we developed a new methodology and algorithm for selecting the most suitable VTOL aircraft concept according to predefined requirements and engineering characteristics. The approach is highly automatable and can be applied to a multitude of engineering problems. The algorithm creates a large potential VTOL concept space. These concepts are then assessed, and the results are evaluated to create a concept ranking.

Goal:
A Proof-of-Concept code has already been developed in Python to prove the methodology's potential, it lacks some desired features as well as a solid back end. Therefore, the program should be redeveloped to accommodate all features of the methodology, leave space for future expansion, provide a sleek and simple user interface, and be significantly more resource-efficient than the current code implementation.

About us:
We are looking for one or two independent and highly motivated students in their Masters who have programming experiences and are interested in the field of (VTOL) concept design. You will work in a team with Aerospace Master students who have already developed the concept selection methodology and the initial PoC.

Skills: Able to independently familiarize oneself with new, conceptual topics, solution-oriented thinking when it comes to programming, interest in design methods, and vertical flight.

Tools: Python / SQL
Language: English/German
Start: As soon as possible
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