

INTERNSHIP 6 MONTHS YEAR 2020

Internship tutors:

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Internship with ISAE SUPAERO - Toulouse

Location: ISAE SUPAERO - Toulouse

Starting Date: between 01/03/2020 to 30/06/2020

Duration: 6 months

Title: MODELIZATION OF PROPELLER-WING INTERACTIONS FOR PRELIMINARY DESIGN OF DISTRIBUTED PROPULSION AIRCRAFT

ISAE-SUPAERO is an institute dedicated to aerospace engineering higher education and research. ISAE-SUPAERO develops a research focused on the future needs of aerospace or high-tech industries.

The ISAE-SUPAERO Department of Aerospace vehicles design and control (DCAS) supports activities related to the design and development of aerospace systems. The DCAS researchers belong to three research groups:

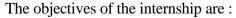
- Aerospace vehicle design
- Decision and Control
- Neuro-ergonomics and human factors

The research groups collaborate on the following topics:

- Design and operation of safer aircraft
- Integrated multidisciplinary design of aircraft
- Advanced space concept.

The internship is related to the multidisciplinary design of innovative CS-23 aircraft architectures, as part of research chair ISAAR (Innovative Solutions for Aircraft Architectures & Regulation). The intern will be integrated in the Aircraft Design research team of DCAS Department.

The final purpose of the internship is to be able to evaluate and properly calculate, at aircraft level, in conceptual and preliminary design, the influence of propeller-wing interaction for traditional, wing-distributed-propulsion and wingtip-propulsion CS-23 aircraft architectures.



- To establish a state-of-the-art review of models for the evaluation of wing-propeller interaction and its influences on aircraft aerodynamics properties;
- To theoretically develop parametric low- and mediumfidelity models to estimate the influence of wing-propeller interaction on aircraft aerodynamic properties for abovementioned aircraft architecture;
- To code the models in appropriate package(s) and integrate them in the sizing loops of the Overall Aircraft Design platform FAST (programming language: Python); the selection of the relevant design variables and interfaces to consider for integration in FAST will be done in collaboration with the team in charge of FAST development;



NASA X-57 Maxwell © NASA



EcoPulse demonstrator © Daher

- To refine, as much as necessary, the models that have been proposed (e.g. VLM for interaction evaluation, electrical engine characteristics, propeller);
- To run some case-studies in FAST and evaluate the results to improve the models.

REQUIRED SKILLS

Skills : Aerodynamics, Propulsion, Aircraft architecture, Systemic interdisciplinary background, Python coding Soft skills : autonomy, curiosity, innovation

APPLICATION FOR INTERNSHIP

To apply: CV and motivation letter to be send by email to Joël JEZEGOU (joel.jezegou@isae.fr)

For further information: please contact Joël JEZEGOU (joel.jezegou@isae.fr)