

Job Title: Research Fellow (Post-Doctoral Researcher) MiniPADS Project

School/Department: ISAE-SUPAERO, Toulouse, France.

Department of Aerospace Vehicle Design and Control (DCAS)

Job Category and Level: Research, Appointment as Post-Doctoral Researcher

Closing Date: Monday, 9th January 2023



The Purpose of the Role

The Department of Aerospace Vehicle Design and Control (DCAS) at ISAE-SUPAERO, Toulouse seeks to appoint an outstanding, enthusiastic, and highly motivated Research Fellow who will contribute to a project that uses machine-learning methods and more specially reinforcement learning to improve guidance and control laws of precision airdrop system under parafoil. The post-holder will work in an exciting environment alongside a highly creative and motivated team, to define, simulate and validate with flight tests, guidance laws determined by reinforcement learning.

Context

ISAE-SUPAERO is an international reference institution for higher education and research in the field of aeronautics and space. ISAE-SUPAERO's research is based on scientific knowledge, models, methodological approaches and tools for the design of aeronautical, space and embedded systems.

The scientific activity of the Research and Teaching Resources Directorate is organized into departments, including the Department of Aerospace Vehicles Design and Control (DCAS). The DCAS carries out education and research activities related to the development of engineering models, methods and tools for the design and operation of aerospace vehicles.

DCAS researchers are divided into 4 research groups (Aircraft Design, Space Vehicles Design, Decision and Control, Human Factors) which contribute to 3 research themes:

- Integrated Multidisciplinary Aircraft Design
- Humans, Systems and Interactions
- Advanced space concepts.

Precision Aerial Delivery Systems are unpowered and drop from a cargo aircraft in order to deliver goods in at a given point of interest. There are today composed by a large steerable ram air parafoil, guided by electrical actuators. The actuators are controlled by an AGU (Airborne Guidance Unit) which is composed by sensor and computers to determine the optimal or the best commands to apply. The payload is attached under it.

The MiniPADS project aims to investigate how machine learning can improve the delivery accuracy in general but also in adversary condition of wind.

Missions

Within the MiniPADS project, this post-doctoral position has two main missions: participation in research on improving the control and the precision of parafoil for delivery systems, and development of the flight test demonstrator to validate the control laws code. He/She will also participate of the flight tests campaigns with DGA-TA. Other research flight dynamics and GNC research topics will be considered. The position holder is expected to supervise students and trainees and may occasionally participate in ISAE-SUPAERO teachings. He/She will be able to promote research results through communications and publications in high-level journals.

Required profile for the candidate

The candidate has skills in the following fields: flight dynamics, GNC (guidance, navigation and control), machine learning, reinforcement learning. A solid background in programming in Python language, in ROS and Embedded systems is required. Fluency in written and spoken English is required.

Duration of the position

24-month fix-term contract

Application Information

To apply candidates should submit the following documentation via email to: philippe.pastor@isae-supaero.fr, indicating exactly “[MiniPADS] Application” in the subject line:

- A motivation letter clearly indicating how the applicant’s profile and skills fit the requirements of this position (max. 2 pages)
- A full curriculum vitae
- Names, affiliation, and contact details of 3 referees (with their email addresses included).

Application deadline: Monday, 9th January 2023

Philippe PASTOR

Associate Professor in Flight Dynamics

Department of Aerospace Vehicle Design and Control

ISAE-SUPAERO - www.isae-supaero.fr