

Research Assistant Position

Aerostructural Optimization of Ultra-High Aspect Ratio Wings Temporary Position (initial contract of 3.5 years), Salary Level TV-L E13, 100%

Background:

The efficiency gains offered by ultra-high aspect ratio wings are key to increase the sustainability of air travel as the volume of passengers continues to grow. However, a fully viable and deployable solution has not yet been proposed due to technological, certification and operational limits, which are mainly due to complex aeroelastic behavior and constraints from both manufacturing methods and airport infrastructure. This project is centered around the idea that future-generation aircraft with ultra-high-aspect-ratio wings is conceivable with forward-looking technologies and physics-based multidisciplinary analysis and optimization approaches. Critically, this project will introduce a paradigm shift towards robust design methods, inherently built with a quantitative management of uncertainties in both operating conditions as well as model predictive capabilities. The project will also introduce a number of carefully selected technologies into the aero-structural design process of novel aircraft configurations. Multidisciplinary designs optimization of representative aircraft will address short-range, medium range and long range missions

Employment:

The position is located at the Institute of Aircraft Design and Lightweight Structures in Braunschweig. The position is part-time suitable, but should be occupied 100%. The entry date is April 1st 2020, and the duration is 42 months. Depending on fulfilment of personal requirements, the remuneration is based on the salary level TV-L E13. International applicants may have to successfully complete a visa process before hiring can take place. We are an equal opportunity employer and all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin, disability status, or any other characteristic protected by German law. TU Braunschweig aims to increase the share of women in academic positions. Applications from female candidates are explicitly encouraged. Where candidates have equal qualifications, preference will be given to female applicant. Besides, candidates with disabilities will be preferred if equally qualified.

Task:

This project includes the overall design of a few different aircraft, i.e. a short range, a medium range and a long range aircraft, with ultra-high aspect ratio wings. After the initial conceptual design, more refined design optimization will be carried out. For this purpose, a coupled-adjoint aerostructural analysis and

optimization tool will be used. The tool is based on an in-house tool of TU Braunschweig, however several modifications need to be implemented. A multi-fidelity multidisciplinary design optimization will be carried out to refine the aircraft (mainly wing) design. In addition to that, high fidelity CFD analysis of the optimized aircraft is required to verify the design optimization.

Who we are looking for:

The requirements for this position are as follows:

- A Master of Science degree in aerospace engineering.
- Knowledge and experience of aircraft design.
- Knowledge and experience of multidisciplinary design optimization.
- Knowledge and experience in aerostructural optimization.
- Knowledge and experience of application of CFD for aircraft aerodynamic analysis.
- Strong programming skills (Python and C++).
- Excellent communication skills in spoken and written English.
- Creativity, positive attitude, and perseverance.

Application Process:

Applications should be sent by e-mail to Prof.Dr. Ali Elham (a.elham@tu-braunschweig.de) and must contain the following documents:

- Motivation Letter
- Curriculum Vitae including complete address, phone number, email address, educational background, language skills, and work experience
- Copies of bachelor and master diploma and transcript of grades (and English translation if the original documents are not in English)
- Additional Documents must be provided on request

All documents should be in PDF format in a single file. Personal data and documents relating to the application process will be stored electronically. Please note that application costs cannot be refunded. The deadline for applications is Feb. 15th 2020.