Technische Universität Braunschweig

Institut für Flugzeugbau und Leichtbau
IFL

Research Assistant Position

Aerostructural Optimization with Tow Steered Composite Structures

Temporary Position (initial contract of two years), Salary Level TV-L E13, 100%

Background:

Variable stiffness laminate technology uses a spatial variation of material stiffness to tailor the composite mechanical properties of a laminate to the application-specific loads, boundary conditions, and required failure behavior. Spatial variation of material variation can be obtained with four structural design concepts: steering of fibers, manipulation of fiber volume fraction, ply thickness variation, and a combination of the three previous methods. The Chair of Aircraft Design of TU Braunschweig is actively working on devolvement and implementation of advanced Multidisciplinary Optimization methods/tools for the design of future transport aircraft. The goal of this project is to develop and apply an aerostructural optimization method for the design of aircraft lifting surfaces with variable stiffness composite structures.

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 January 1st 2021, and the initial duration is 24 months. Depending on the fulfillment of personal requirements, the remuneration is based on the salary level TV-L E13. International applicants may have to 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 the female applicant. Besides, candidates with disabilities will be preferred if equally qualified.

Task:

The qualified candidate for this position is supposed to develop a framework for aerostructural analysis and optimization of aircraft lifting surfaces with tow steered composite structures. The framework includes state of the art CFD analysis (available tools), and an extension of an existing tool for finite element analysis of tow steered composite structures. A geometrically nonlinear finite element model needs to be implemented. The aerostructural framework is based on the coupled adjoint sensitivity analysis method, therefore the FEM code needs to be differentiated analytically. The coupled framework will be used for the design and optimization of aircraft lifting surfaces for different passenger aircraft.

Who we are looking for:

The requirements for this position are as follows:

- A Master of Science degree in aerospace or mechanical engineering.
- Knowledge and experience of design and optimization of composite structures.
- Knowledge and experience of finite element analysis and programming.
- Knowledge and experience of aerostructural coupling and optimization.
- Strong programming skills (C++, Python, Matlab).
- 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 October 30th 2020.