



Job Vacancy (m/f/d)

At the Institute of Fluid Mechanics of the Technische Universität Braunschweig starting 01.09.2021 or soon after. The deadline for submitting an application is **30.07.2021**. The offered position is for a

scientific employee (m/f/d, full time) on "Machine Learned Surface Dynamics for Drag Reduction of Turbulent Compressible Airfoil Flow"

for a 3 years contract with a possibility for extension. The position is full time (39.8 hrs/week) and aimed at candidates who would like to *pursue a doctorate degree*.

The project is financed by the German Research Foundation (DFG) as part of a joint project with RWTH Aachen. The overall project objectives include the simulation, modeling, optimization, and control of an actuated turbulent boundary layer with the objective of drag reduction. The project shall use state-of-the-art scale-resolving numerical simulations, optimization algorithms, machine learning techniques, and closed-loop control. The project motivation lies in the necessity to optimize the actuation settings, to understand the flow physics, to model the flow field, and to identify optimal closed-loop drag minimizing actuation control law.

Main Research Activities:

- Development and deployment of control-oriented Cluster-based Network Modeling (CNM) algorithm
- Development and implementation of CNM-based closed-loop control
- Development and implementation of a multi-fidelity Bayesian optimization algorithm
- Expansion and adaptation of the in-house flow modeling tool flowTORCH
- Flow analysis and modeling
- Publishing

Competencies sought:

- Completed Master of Science degree in Engineering or Physics with good standings
- Good knowledge in fluid mechanics, programming (Matlab, Python), optimization, and machine learning
- Independent, sociable, enthusiastic, and willing to work in teams and to travel abroad
- Good spoken and written English. Good spoken German is a plus.

This appointment will be compensated by 100 % TV-L up to E13 for 3 years, and offers the possibility of a PhD. 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. For the purpose of carrying out the application process, personal data will be stored. In the case of severe disability, proof must be attached. Application expenses cannot be reimbursed.

Application:

Please send your application including all necessary documents to:

Dr. Richard Semaan
Institut für Strömungsmechanik der TU Braunschweig
Hermann-Blenk-Str. 37, 38108 Braunschweig

If you have any questions, please contact Dr. R. Semaan, Tel.: 0531/391-94258, e-mail: r.semaan@tu-braunschweig.de