



Technische
Universität
Braunschweig

Institut für Intermodale
Transport- und
Logistiksysteme



SE²A

PhD-Researcher Position (m/f/d) within the SE²A Research Cluster

Robust optimization of multi-modal transportation systems

Temporary Position (up to 3 years), up to Salary Level EG 13 TV-L, 100%

Background:

The Cluster of Excellence SE²A - *Sustainable and Energy-Efficient Aviation* is a DFG-funded interdisciplinary research center investigating technologies for a sustainable and eco-friendly air transport system. Scientists from aerospace, electrical, energy and chemical engineering as well as economics and social science are working on the reduction of drag, emissions and noise, life-cycle concepts for airframes, improvements in air traffic management and new technologies for energy storage and conversion. Technische Universität Braunschweig, the German Aerospace Center (DLR), Leibniz University Hannover (LUH), the Braunschweig University of Art (HBK) and the National Metrology Institute of Germany (PTB) have joined forces in this extraordinary scientific undertaking. The overall project is structured into the three core research areas “Assessment of the Air Transport System”, “Flight Physics and Vehicle Systems” and “Energy Storage & Conversion”.

(www.tu-braunschweig.de/en/se2a)

Employment:

The position is located at the Institute for Intermodal Transport and Logistics Systems (www.tu-braunschweig.de/itl) in Braunschweig. The entry date is as soon as possible, and the duration is initially limited until the end of 2025. The position is part-time suitable but should be occupied 100%. Active participation in SE²A's own doctoral program complementary to the programs of the institutions is an integral part of this position. The payment is made according to task assignment and fulfillment of personal requirements up to salary group EG 13 TV-L. International applicants may have to successfully complete a visa process before hiring can take place. Applications from international scientist are welcome. The Cluster SE²A aims to increase the share of women in academic positions. Applications from female candidates are very welcome. Where candidates have equal qualifications, preference will be given to female applicants. Candidates with handicaps will be preferred if equally qualified. Please enclose a proof.

Task:

Within the project, we develop a multilevel model to address the four-hour-door-to-door problem using airports as focal points. Based on an existing simulation for the European flight and ground operations, an extension to integrate the hinterland operations will be derived. To this end, the requirements of respective stakeholders such as, e.g., airline companies, passengers, logistic companies and aircraft manufacturers for the combined scenario will be formalized together with other working groups. Using a multi-agent program already developed at ITL and an air traffic and ground simulator developed in the Research Cluster, a multi-modal transport and logistics simulation will be derived. The simulation will form the backbone of an optimization, which will address the derived key performance indicators and bounds in a three-level multi-criteria approach. Since hinterland and airport operations are typically done by different juristic units, the coordination between the hinterland and airport simulators is essential for business and cooperation scenarios. To this end, coordination mechanisms ranging from centralized to distributed and cooperative to noncooperative settings will be implemented serving as integration tests of the overall simulation. The present research will be conducted in close collaboration with three additional researchers within the Research Cluster itself, the ITL and other research groups within the Research Cluster that focus on overall aircraft design and collaborative, multi-disciplinary system design.

Who we are looking for:

- *PhD candidates or PostDocs from the fields computer science, electrical/mechanical engineering, physics or mathematics*
- *Strong background in systems engineering and software development*
- *Profound knowledge in application of modeling, simulation and optimization*
- *Good command of written and spoken English*
- *Self-initiative and result oriented working approach*

Application Process:

Applications should be sent by e-mail to (j.pannek@tu-braunschweig.de) or written to Jürgen Pannek, Hermann-Blenck-Str. 42, 38518 Braunschweig, Germany, and must contain the following documents until 18.11.2022.

- 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 in original language and in English or German translation
- Additional Documents must be provided on request

All documents should be in PDF format, preferably 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. For the purpose of carrying out the application process, personal data will be stored.

For more information, please call Jürgen Pannek on +49 (0) 531 391 66300.