



Technische  
Universität  
Braunschweig



Institute for  
Mathematical  
Optimization



**PhD-Researcher Position (m/f/d) within the SE<sup>2</sup>A Research Cluster**

***Discrete Optimization for the future airtransport system***

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

**Background:**

The Cluster of Excellence SE<sup>2</sup>A - *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 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](http://www.tu-braunschweig.de/en/se2a)

**Employment:**

The position is located at the Institute of Automotive Management and Industrial Production (AIP), Chair of Production and Logistics (<https://www.tu-braunschweig.de/aip/pl>), at the Technische Universität 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 SE<sup>2</sup>A's own qualification programme is mandatory, the time effort for this training measure entails 10% of the working time. 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 scientists are welcome. The Cluster SE<sup>2</sup>A 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:**

The successful applicant will work in the Junior Research Group "Overall System Evaluation" with Dr. Imke Joormann. The group consists of scientists from mathematics and economics. Its task is to investigate the impact of different parameters on the air transport system. To this end, a range of tools and models is developed, e.g., solving a MILP to determine optimal fleet replacement strategies. The successful

applicant is expected to contribute to this research, in particular by improving MILP solvers for large scale problems. The opportunity to pursue a Ph.D. degree is given and encouraged.

**Who we are looking for:**

- Completed scientific higher education (master, university diploma) in Mathematics, Computer Science (or a closely related field)
- Solid knowledge in the area of Discrete Optimization
- Programming skills in C/C++ and/or Python
- Good command of written and spoken English
- Interest in working on topics with a real-world application, in cooperation with partners from engineering and economics
- experience with SCIP/Gurobi/Cplex would be desirable

**Application Process:**

Applications should be sent by e-mail or mail<sup>1</sup> to Dr. Imke Joormann ([i.joormann@tu-braunschweig.de](mailto:i.joormann@tu-braunschweig.de)) until **December 15, 2022**, and must contain the following documents:

- Motivation letter
- Curriculum vitae including complete address, phone number, e-mail address, educational background, language skills, and work experience
- Copies of bachelor's and master's diplomas 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 contact Imke Joormann by e-mail ([i.joormann@tu-braunschweig.de](mailto:i.joormann@tu-braunschweig.de)) or phone (+49 (0) 531 391-2216).

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