

TUD Dresden University of Technology, as a University of Excellence, is one of the leading and most dynamic research institutions in the country. Founded in 1828, today it is a globally oriented, regionally anchored top university as it focuses on the grand challenges of the 21st century. It develops innovative solutions for the world's most pressing issues. In research and academic programs, the university unites the natural and engineering sciences with the humanities, social sciences and medicine. This wide range of disciplines is a special feature, facilitating interdisciplinarity and transfer of science to society. As a modern employer, it offers attractive working conditions to all employees in teaching, research, technology and administration. The goal is to promote and develop their individual abilities while empowering everyone to reach their full potential. TUD embodies a university culture that is characterized by cosmopolitanism, mutual appreciation, thriving innovation and active participation.

For TUD diversity is an essential feature and a quality criterion of an excellent university. Accordingly, we welcome all applicants who would like to commit themselves, their achievements and productivity to the success of the whole institution.

At the **“Friedrich List” Faculty of Transport and Traffic Sciences, Institute of Railway Systems and Public Transport**, the **Chair of Rail and Urban Public Transport**, offers a position as

Research Associate / Postdoc (m/f/x)

(subject to personal qualification employees are remunerated according to salary group E 13 TV-L)

on the topic of **Passenger-centric multimodal traffic scheduling**, starting **as soon as possible** and initially for a period of 2 years. The period of employment is governed by the Fixed Term Research Contracts Act (Wissenschaftszeitvertragsgesetz-WissZeitVG). There is the possibility of further employment in other research projects. The position offers the chance to obtain further academic qualification.

Chair of Rail and Urban Public Transport

At the Chair, we develop advanced quantitative techniques to promote more efficient, resilient, and sustainable railway and multimodal transport systems. We address a wide range of problems, from long-term planning to real-time traffic management in passenger and freight transport combining optimization, AI, simulation and advanced analytics.

Project description

Europe's long-term vision envisages a future in which air transport becomes an integrated part of a multimodal transport system and, by the year 2050, makes it possible for 90% of travellers within Europe to complete their door-to-door journey within 4 hours. In parallel, the European Commission's Sustainable and Smart Mobility Strategy (European Commission, 2020) has defined a multitude of goals and respective flagships that pave the way towards zero-emission, resilient and inclusive mobility, creating seamless and efficient connectivity and establishing the European Union as a connectivity hub. One of the goals is a stronger focus on multimodality, which encompasses, among others, a fully integrated and seamless multimodal mobility system and a high quality transport network with high-speed rail (HSR) services on short-haul distances and with clean aviation services improving the coverage of long-haul routes.

Within the MultiModX project, you will have an opportunity to contribute towards developing multimodal European transport system in which air and rail networks are planned and managed in a coordinated manner to maximise the efficiency, predictability, environmental sustainability and resilience of the door-to-door passenger journey. The goal is to develop a set of innovative multimodal solutions and decision support tools for the coordinated planning and management of multimodal

transport networks. You will work on developing state-of-the-art models and algorithms for multimodal scheduling particularly focussing on future air-rail networks. You will also explore the available data and sharing requirements needed for a more coordinated optimisation of two (or more) transport modes. Particularly, the models will take into account passengers' perspective including multimodal demand, itineraries and preferences. At tactical level, air and rail services will be scheduled in more synchronised manner in order to provide seamless connections to passengers. At operational level, air and railway operations are to be jointly adjusted to better respond various disruptions leading to minimizing overall inconveniences to passengers. The models and algorithms will be tested within a newly developed multimodal performance assessment tool.

You will join an international, dynamic and diverse team at Chair of Rail and Public Urban Transport. You will become part of the TUD Graduate Academy, which provides coaching on education, transferable skills and research-related topics, and work in a unique research environment of the Faculty of Transport and Traffic Sciences that gathers researchers in planning, management, automation, sustainability and also simulation, optimization, analytics and machine/reinforcement learning. Finally, you will become part of an international multidisciplinary project consortium of leading European universities and companies including partners from Spain, UK and Belgium.

Tasks:

You will have the possibility to work on research topics including:

- Develop state-of-the-art optimization models for multimodal transport planning and/or disruption management.
- Collect and analyse multimodal transport data including operations and passengers
- Apply mixed integer programming, simulation-based optimization, passenger routing modelling,
- Integrate developed models with a high-fidelity multimodal transport simulation tool
- Cooperate with a multidisciplinary team, attend project meetings, and write scientific reports and deliverables.
- Write scientific articles and present at premier scientific conferences.
- project-related co-supervising BSc/MSc and PhD students.

Requirements:

- Hold a university and PhD degree in transport, optimization, operations research, applied mathematics, computer science, artificial intelligence or a related field.
- Experience with mathematical optimization and data analysis.
- solid programming skills.
- Collaborative attitude, take initiatives, and be results-oriented.
- good communication skills in English, both written and verbal.
- Knowledge of the German language is not a prerequisite.

If you have any questions, please contact Dr. Nikola Bešinović nikola.besinovic@tu-dresden.de.

TUD strives to employ more women in academia and research. We therefore expressly encourage women to apply. The University is a certified family-friendly university and offers a Dual Career Service. We welcome applications from candidates with disabilities. If multiple candidates prove to be equally qualified, those with disabilities or with equivalent status pursuant to the German Social Code IX (SGB IX) will receive priority for employment.

Please submit your detailed application with the **subject "application MultiModX"** with the usual documents (letter of motivation, curriculum vitae including a list of publications, summary of your PhD thesis, recent representative journal publications, names of 2 references) as a PDF document preferably via the SecureMail Portal of the TU Dresden <https://securemail.tudresden.de> to: bsrv@tu-dresden.de or to **TU Dresden, Fakultät Verkehrswissenschaften "Friedrich List", Institut für**

Bahnsysteme und Öffentlichen Verkehr, Professur für Bahnverkehr, öffentlicher Stadt- und Regionalverkehr, z. Hdn. Herrn Dr. Nikola Bešinović, Helmholtzstr. 10, 01069 Dresden, Germany by **August 25, 2023** (stamped arrival date of the university central mail service applies). Please submit copies only, as your application will not be returned to you. Expenses incurred in attending interviews cannot be reimbursed.

Reference to data protection: Your data protection rights, the purpose for which your data will be processed, as well as further information about data protection is available to you on the website: <https://tu-dresden.de/karriere/datenschutzhinweis>.