Full Professor
for
„Transportation Systems Engineering / Vernetzte Verkehrssysteme“

Supplementary information on the content and integration of the professorship

1. Subject orientation of the professorship

The professorship will focus on research and teaching with the goal of developing the overall transport system from a technical and operational point of view, including all modes of transportation. As the wide variety of public transport systems and innovative mobility services gain importance in addressing the mobility demands in person and freight transport worldwide, a focus must be placed on the integrated consideration of solution and optimization approaches within the overall transport system. Key targeted fields of research are therefore:

- Functional, technical and organizational system architectures
- Integrated modelling and simulation of dynamic transport systems
- Intermodal and multimodal connection of innovative mobility services
- Operation and control technology for public transport systems
- System engineering and operations for supply and service logistics in freight transport
- Digitalization and (semi-)automation of transport systems

Depending on the individual preferences of the professor, specific economic topics may also be relevant (organization of mobility services and transport organizations, cost-benefit analyses as well as financial and business models). These topics could be addressed as an independent target field or as topics for close cooperation with other research entities or departments.

A scientific challenge is seen in the development as well as systemic modelling and simulation of highly complex dynamic transport systems, which have been modelled to date mainly as isolated partial systems or in the best cases as coupled systems. Due to the fast progress in traffic related technical development (automation, information, communication, connection, digitization, data collection), a holistic understanding of the traffic system is becoming increasingly important and scientifically challenging. This is especially critical when considering systems engineering as a basis for effective and sustainable mobility solutions.

2. Integration within TUM

The focus area “Mobility and Transportation Systems” of the department of Civil, Geo and Environmental Engineering is currently comprised from three professorships: “Urban Structure and Transport Planning”, “Road, Railway and Airfield Construction” and “Traffic Engineering and Control”. Beginning in autumn 2015 this will be extended by an assistant professorship “Modelling Sustainable Mobility”.
This announced fifth professorship (full professorship) will complete the department portfolio of transportation and mobility research. The professorship will in addition contribute to the increased interconnection with other institutes and departments at TUM. It will in this way create an important interface to disciplines at TUM that are relevant to transportation systems research (computer science, automotive engineering, electrical engineering, economics) as well as interdisciplinary and cross-department institutions and centers such as the science center for electromobility, the Munich School of Engineering (MSE) or the Munich Center for Technology in Society (MCTS).

3. Integration in education

The subject areas should include the overall view of the transport system with a focus on system architectures, system modelling and intermodality. This includes in particular:

- Midterm assumption of the management of the international master’s program “Transportation Systems”
- Lecturing in the areas of “System architectures for connected transportation systems”, “System modelling”, “Intermodality in connected systems”, “Technology use and automation in public transport”, among others, for the master’s programs “Transportation Systems”, “Civil Engineering”, “Environmental Engineering” and “Transport and Logistics“ (TUM Asia Singapore).

Due to the required high interaction with neighbouring disciplines, especially in engineering, a close exchange and ideally the export of teaching to other TUM study programs is desired.

The curriculum is mainly taught in English.