
Ph.D. Position (m/f/d) – Data-driven Modeling of Structural Foams for High-Voltage Storage

Professorship of Data-driven Materials Modeling

Department of Engineering Physics and Computation - Technical University of Munich

email: contmech@mw.tum.de

Industrial Partner: BMW Group

About the Project

This Ph.D. project focuses on the data-driven modeling and optimization of structural foams used in high-voltage battery systems for electric vehicles. As part of BMW's passive safety and electrification strategy, the research aims to develop a multidisciplinary framework that combines microstructure modeling, machine learning, and probabilistic simulation to link manufacturing parameters, foam morphology, and mechanical performance. By enabling predictive and optimization-driven design, the project seeks to achieve lightweight, cost-efficient, and safe structural foams for next-generation battery housings. The work will be conducted under the supervision of Prof. P.S. Koutsourelakis in the Data-driven Materials Modeling group at the Technical University of Munich (TUM), in close collaboration with BMW's simulation and materials engineering teams.

Requirements

- Master's degree in mechanical engineering, data science, materials science, physics, or a comparable field
- Strong experience with finite element methods and/or other numerical simulations
- Background in polymer or foam mechanics, or microstructure modeling
- Knowledge of optimization (multidisciplinary, gradient-free and/or gradient-based)
- Proficient in Python; MATLAB or other ML/data-science tools are a plus
- Ideally, proficiency in ML/AI methods (regression, cross-validation, hyperparameter tuning) and data-driven or surrogate modeling
- Very good English skills; very good German skills are an advantage

Offer

- Comprehensive mentoring & onboarding
- Personal & professional development

- Flexible working hours
- Digital offers & mobile working
- Attractive remuneration
- Apartment offers for students (subject to availability & only Munich)
- And many other benefits – see here

Framework Conditions

- Starting date: not earlier than 01.01.2026
- Duration: 3 Years
- Location: BMW Group and TUM-Garching facilities

Application

See Job Id 151492 and follow the steps described here

Please apply exclusively online through the BMW career portal (Job Id 151492).

Applications submitted via other channels (including email) cannot be considered. Citizens of countries outside the European Union must have a valid residence or work permit for the duration of the program.