



Universität der Bundeswehr München

Institut für **Mathematik und
Computergestützte Simulation**

der Bundeswehr
Universität München

To further strengthen our internationally oriented research team at the [Institute for Mathematics and Computer-Based Simulation \(Prof. Popp\)](#), we are looking for several

Research Assistants – PhD Students and Postdocs
(remuneration according to remuneration group E 13/14 TVöD)

in the following research areas

**Machine Learning / Data-Driven Modeling / UQ
Hybrid Digital Twin / Reduced-Order Modeling
Computational Contact Mechanics / FEM
High Performance Computing / Parallel Algorithms**

Within the scope of his or her work, each employee is expected to work independently on future-oriented research topics, especially a project funded by the newly founded *Center for Digitization and Technology Research (DTEC.Bw)* in collaboration with the established university research center *RISK: Risk, Infrastructure, Security, Conflict*. The topic of the project is "Intelligent critical technical infrastructure – from reality to hybrid digital twins".

The positions are initially limited to *four years*, but an extension is possible if additional research funding is successfully acquired, which is also being sought by the professorship. An orientation towards the qualification goal of obtaining a doctorate (Dr.-Ing.) or habilitation during the time at the institute is supported and explicitly desired. The workplace will be located in Neubiberg / Munich.

About us

Since 2018, the Institute for Mathematics and Computer-Based Simulation (IMCS) is part of the Faculty of Civil Engineering and Environmental Sciences and offers a unique interdisciplinary environment with bundled competences in the development of numerical methods, solid and structural mechanics, multiphysics modelling and simulation as well as high performance computing (HPC). Our main research and teaching focus lies in the field of computer-based simulation, in particular based on finite element methods (FEM), challenging problems in nonlinear solid and structural mechanics, contact mechanics, fiber-based materials as well as coupled multi-field and multi-scale problems (e.g. fluid-structure interaction).

Our applications range from civil engineering and environmental sciences to aerospace engineering, modern manufacturing technologies (e.g. composite materials), biomechanics and biomedical engineering. In our research projects we cover the entire spectrum from modelling and numerical method / code development to optimization, stochastic methods and uncertainty quantification (UQ). For this purpose, the research group co-develops and co-maintains the software package BACI, one of the world's most powerful FEM research codes with massive parallelization for use on computing clusters / supercomputers (together with research partners at TU Munich). Since 2020, the institute has been operating a new *Data Science & Computing Research Laboratory* at the department, which includes its own and exclusive HPC cluster with more than 500 computing cores, thus providing an excellent technical framework for top international research.

Your tasks

- carrying out innovative research projects including their presentation and documentation
- scientific publishing, contributions to new research funding proposals / grants
- support of academic teaching **in German language** (exercises, internships, teaching materials) in the study programs of the department and in Mathematical Engineering
- research-related administrative tasks, e.g. with regard to HPC software development

Your qualification

- excellent degree in a university engineering course (civil engineering, mechanical engineering, aerospace engineering, electrical engineering) or in applied mathematics, physics or computer science
- very good theoretical skills and profound knowledge in the fundamentals (mechanics, mathematics, etc.), in the field of computational mechanics (FEM, etc.) and in programming (C++, etc.)

We expect

- high commitment and motivation for scientific work on a top international level
- a pronounced degree of independence, team spirit and determination
- high creativity and the ambition to "get things done" in a small team
- strong communication and didactic skills in teaching and, more generally speaking, in the supervision of our students

We offer

- high creative freedom in research and teaching
- a pleasant working atmosphere in an excellent and committed team within a well-equipped environment
- comprehensive further education opportunities (language center, ProfiLehrePlus)
- a high level of support and interaction with professors / head of the research lab
- the opportunity for scientific qualification (doctorate, habilitation)
- a lively international exchange with numerous leading working groups and the best universities worldwide
- optimal future chances for a career in academia or industry
- attractive full-time contracts with competitive remuneration according to the TVöD collective agreement
- a unique living environment in Munich – one of the most attractive cities in the world with unlimited leisure opportunities and a dynamic job market
- attractive sports and leisure facilities directly on campus

How to apply

Incoming applications will be screened immediately until the position is filled. Therefore, please send your complete application documents (one PDF file including letter of motivation, curriculum vitae, copies of certificates) **as soon as possible, but no later than November 30th, 2020**, by e-mail to

Prof. Dr.-Ing. Alexander Popp

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