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 a

Research Assistant – PhD Student
(remuneration according to remuneration group E 13 TVöD)

in the following research areas:

Computational Mechanics | Finite Element Methods | Mixed-Dimensional Coupling | Iterative Solvers | Algebraic Multigrid Methods | High-Performance Computing

The successful candidate will be a key contributor to the project *Stable discretization methods and scalable solvers for embedded fiber/solid coupling*, funded by the German Science Foundation (DFG). In addition to novel approaches for the mixed-dimensional embedding of slender beams in solids using the finite element method, this project will develop custom-built iterative equation solvers and preconditioning methods to deliver not only a highly accurate, but also a highly performant simulation tool chain. Within the scope of his or her work, the successful candidate is expected to work independently and in close coordination with the project lead and the institute director to advance the institute's research agenda and vision.

The (full-time) position is initially limited to *three years*. Pending successful acquisition of further research funds, an extension is possible and pursued by the professorship. An orientation towards the qualification goal of obtaining a doctorate (Dr.-Ing.) during the time at the institute is supported and explicitly desired. The workplace will be located in Neubiberg, Munich. Earliest starting date is November 1, 2023.

About us

Since 2018, the Institute for Mathematics and Computer-Based Simulation (IMCS) is part of the Department 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 modeling and simulation, high performance computing (HPC), machine learning as well as digital twins. 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 (e.g., critical infrastructure) to aerospace engineering, manufacturing technologies (e.g., composite materials), biomechanics and biomedical engineering. In our research projects, we cover the entire spectrum from modeling and numerical method / code development to optimization, stochastic methods, machine learning and uncertainty quantification (UQ). For this purpose, the research group develops and maintains the software package BACI, one of the world's most powerful FEM research codes with massive parallelization for use on computing clusters and supercomputers, together with research partners at Technical University of Munich (TUM). Since 2020, the institute has been operating the *Data Science & Computing Lab*, which includes its own and exclusive HPC cluster with more than 1,000 computing cores, thus providing an excellent technical framework for internationally visible 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., regarding 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
- for postdocs: very good PhD dissertation in one of the mentioned research fields
- excellent 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

- large 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 postdocs, head of the research lab, and professors
- 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*** via e-mail to

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