YOU ARE INTERESTED IN SOLVING COMPLEX MODELLING AND SIMULATION TASKS FROM INDUSTRIAL QUESTIONS?
The "FLOW AND MATERIAL SIMULATION" DEPARTMENT AT THE FRAUNHOFER INSTITUTE FOR INDUSTRIAL MATHEMATICS IN KAIERSLAUTERN OFFERS YOU A VARIED JOB AS

**PHD STUDENT**

»MATERIAL SIMULATION«

To strengthen our team, we are looking for highly motivated PhD students in applied mathematics, physics or mechanical engineering (computational engineering). The PhD topics offered are concerned with the development of numerical methods and multiscale models in connection with current data analysis methods (low-rank tensor decomposition, TensorFlow, PyTorch) for industrial problems. Among other things, we deal with the flow and structural mechanical design of absorption materials and filter systems or the thermomechanical operating and failure behaviour of composite components and batteries.

What you bring with you

You are interested in industrial issues, have a certain thirst for research and have knowledge of mathematical modelling and/or numerical simulation methods.

What you can expect

An exciting and current doctoral thesis in applied research with regular graduation after 3 years on one of the following topics:

- Design and optimization of structures for **3D printing (additive manufacturing)** by combining topology optimization with machine-learning methods.
- Multiscale modelling and simulation of the **thermomechanical failure behaviour** of composite materials
- Electrodynamic microstructure simulation of **ferromagnetic materials** and their correlation to microstructural mechanical Properties
- Multiscale simulation of the application and operating behaviour of **solid electrolyte batteries**

A focus within these topics is possible depending on the interest and qualification of the doctoral student.
We expect from you

- an above-average university degree in mathematics or physics, mechanical engineering (computational engineering) or a comparable qualification
- advanced programming skills (preferably C/C++) as well as an interest in and willingness to implement models in algorithms and software
- the independent documentation and presentation of results in German and English Language.

We offer

- A flexible, innovative and creative environment for scientific work in teams
- Diverse opportunities and offers for international scientific exchange
- Time and course offerings for learning, research and personality development

Funding is generally provided in the form of a doctoral fellowship at increased DFG rates.

The doctorate is initially limited to three years.

Severely disabled people with equal aptitude will be given preferential employment.

The Fraunhofer-Gesellschaft attaches great importance to the professional equality of women and men.

The Fraunhofer ITWM shows an extraordinary commitment to a family-friendly working environment for its employees: flexible working and parental leave, a day-care center for children, the possibility of a home office, the organization of health days and sports activities as well as a parent-child office make the Fraunhofer ITWM in Kaiserslautern an attractive employer.

Fraunhofer is the largest organization for application-oriented research in Europe. Our research fields are geared to people’s needs: Health, safety, communication, mobility, energy and the environment. We are creative, we design technology, we design products, we improve processes, we open up new avenues.

Dr. Konrad Steiner

Information about the department and institute can be found on the Internet at:
http://www.itwm.fraunhofer.de/en/sms

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