Lehrstuhl für Carbon Composites
School of Engineering and Design
Technische Universität München

To extend our team, we are looking for a full-time

Research Associate (m/w/d) in the field of Additive Manufacturing and Structural Simulation

About us

The Chair of Carbon Composites (LCC) at the Technical University of Munich pursues an interdisciplinary research approach from raw materials to production engineering up to complete composite components of fiber-reinforced composite materials and their applications. This includes the development of new manufacturing methods, new approaches for process and structural simulation, as well as research in the field of material characterization and testing.

We are currently seeking new, motivated colleagues for a research project in collaboration with industry partners. The aim is to develop and manufature a highly efficient synchronous reluctance motor (SynRM) through an innovative multi-material printing process and the use of optimized high-performance biopolymer magnets. At TUM, we are focusing on the following research areas:

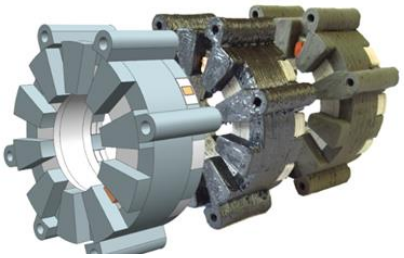

Fig. 1: Stator of a winding headless reluctance machine. Left: CAD model, center: sintered stator, right: printed part before heat treatment [1]

- Development of a 3D printing process to produce synchronous reluctance motors
  - Development of a test setup for the mechanical, magnetic and thermal characterization of printed coupons
  - Experimental research into suitable parameters for the FFF printing process and their influence on the mechanical and thermal properties of the fiber composite material
  - Investigation of the influence of pressure temperature on the magnetic properties of the ferromagnetic composite material
- Development of a structural calculation environment for modeling a synchronous reluctance motor
  - Virtual characterization, modeling at micro scale
  - Development of an environment for structural optimization taking 3D printing effects into account
  - Structural simulation using equivalent material parameters

Fig. 2: SynRM-Toror produced by selective laser melting [2]

Requirements

- Above-average university degree (Diploma or Master's degree) in the fields of materials science, composite materials, plastics engineering, manufacturing technology, or similar
- General interest in manufacturing processes and design of composite structures, experience in simulation
- Enjoyment of experimental work and digitalization methods
- Determination, independent and structured working style and pronounced teamwork and communication skills
- Proficiency in writing longer texts with complex content in German and English

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Tasks

- Independent handling of various tasks in a research project with partners from industry and science
- Participation in the preparation of research proposals
- Supervision and guidance of student theses
- Involvement in teaching in the field of materials science/composite materials
- Supervision of scientific equipment

We offer

- Exciting research and working environment within a young, committed team
- Opportunity for a doctorate aiming for professional and personal development
- Remuneration according to the collective agreement (TV-L)

Application

- The position is initially limited to two years
- Disabled persons will be given preference if they have the same qualifications and suitability
- TUM strives to raise the proportion of women in its workforce and explicitly encourages applications from qualified women
- TUM does not cover any costs associated with attending interviews
- Please send your application via email to personal_24_01.lcc@ed.tum.de. In the case of a written application, we kindly ask you to submit only copies, as we cannot return your application documents after the procedure is completed

Data Protection Notice: As part of your application for a position at the Technical University of Munich (TUM), you will transmit personal data. Please note our privacy policy in accordance with Art. 13 General Data Protection Regulation (GDPR) for the collection and processing of personal data as part of your application. By submitting your application, you confirm that you have taken note of TUM's Privacy Policy.

Technical University of Munich
Chair of Carbon Composites
personal_24_01.lcc@ed.tum.de
Boltzmannstr. 15
85748 Garching
https://www.asg.ed.tum.de/lcc
https://www.tum.de