Technische Universität Braunschweig

Zertifikat seit 2007 audit familiengerechte hochschule

With more than 16,000 students and 3,800 employees, the **Technische Universität Braunschweig** is one of Germany´s leading institutes of technology. It stands for strategic and performance-oriented thinking and acting, relevant research, committed teaching, and the successful transfer of knowledge and technologies to the economy and society. We consistently advocate for family friendliness and equal opportunities.

Our research focuses are mobility, engineering for health, metrology, and city of the future. Strong engineering and natural sciences are our core disciplines. These are closely interconnected with economics, social and educational sciences and humanities.

Our campus is located in the midst of one of the most research-intensive regions in Europe. We work successfully together with over 20 research institutions in our neighborhood as we do with our international partner universities.

Starting from the earliest possible date the Institute of Mechanics and Adaptronics (IMA) is looking for a

# Research Associate (m/f/d) in the field of Investigation of cutting process of agricultural materials

**(EG 13 TV-L, full-time)**

The position is to be filled on a fixed-term basis for an initial period of 3 years. The successful candidate will have the opportunity to pursue a Ph.D. degree.

One of the main research areas at IMA is the mechanical characterization of biological materials. Experimental studies cover a wide range of dimensions, from different deformation states of cells at the microscopic level to whole organs at the macroscopic level. In addition, various multi-scale or multi-field material models have been developed to describe the different mechanical phenomena or the complicated mechanisms behind them. The data-based calibration and validation of the material models aims to gain a better insight into the biological mechanisms in nature and to provide a numerical prediction of the multiphysical problems in industry.

In order to optimize the maize harvesting process with higher processing efficiency and lower energy consumption, the cutting mechanism will be investigated experimentally and numerically in this project. This project will be carried out by Prof. Markus Böl in cooperation with the Institute of Mobile Machines and Commercial Vehicles (IMN). Experimental characterization and material modeling will be the central topics of this project. For the former, different experiments will be designed to investigate the non-fracture and fracture material behavior considering the cellular structures of the maize stalk, while for the latter, numerical methods will be applied to simulate the cutting process as a function of the cutting parameters.

## Your tasks

- You will design the experimental setup and perform various experiments on maize stalks.
- You will develop material models and calibrate them with the experimental results.
- You will implement the model in a standard FEM package.
- You will maintain a regular dialog with the research partner regarding data sharing and processing.
- You will publish research results and participate in national and international conferences.
- You will be involved in teaching at the university (preparation and implementation of courses and supervision of student work).

## Your Qualifications

- You have a degree (Master's or equivalent) in mechanical engineering.
- You have very good knowledge of the German and English language.
- You have good knowledge in linear and nonlinear continuum mechanics.
- You have experience in FEM or in the further development of commercial FEM software.
- You have good manual skills and are prepared to experimentally investigate material behavior.
- You are flexible, can perform under pressure and work well in a team.
- You are aiming for a doctorate.

## We offer

- Work on exciting future-oriented research topics in an inspiring work environment as part of the university community.
- A vibrant campus life in an international atmosphere with lots of intercultural offers and international cooperation.
- Pay in accordance with the collective agreement TV-L (a special payment at the end of the year as well as a supplementary benefit in the form of a company pension, comparable to a company pension in the private sector) including 30 days' vacation per year.
- Flexible working and part-time options and a family-friendly university culture, awarded the "Family-friendly university" audit since 2007.
- Special continuing education programs for young scientists, a postdoc program, as well as other offerings from the Central Personnel Development Department and sports activities.

## Further notes

We welcome applicants of all nationalities. At the same time, we encourage people with severe disabilities to apply. Applications from severely disabled persons will be given preference if they are equally qualified. Please attach a proof of disability to your application. We are also working on the fulfilment of the Central Equality Plan based on the Lower Saxony Equal Rights Act (*Niedersächsisches Gleichberechtigungsgesetz*—NGG) and strive to reduce under-representation in all areas and positions as defined by the NGG. Therefore, applications from women are particularly welcome in this case.

The personal data will be stored for the purpose of processing the application. By submitting your application, you agree that your data may be stored and processed electronically for application purposes in compliance with the provisions of data protection law. Further information on data protection can be found in our data protection regulations at https://www.tu-braunschweig.de/datenschutzerklaerung-bewerbungen . Application costs cannot be reimbursed.

## Questions and Answers

For more information, please call Prof. Markus Böl on +49 (0) 531 391-7050.

## Deadline for applications is 01. June. 2024

If we have aroused your interest, please send your application with meaningful documents in PDF format by e-mail, quoting the reference number **IMA2024-LandGueter** to ima-bewerbung@tu-braunschweig.de.