Technische Universität Braunschweig

With around 15,000 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. The research group Reliable System Software at the Institute for Operating Systems and Computer Networks at TU Braunschweig is looking for applicants for an PhD positions in the area of System Software. The positions are to be filled as soon as possible.

Research Associate / Postdoc / Doctoral Candidate (m/f/d) in the field of OS/DBMS Co-Design for the Cloud

(EG 13 TV-L, full-time)

City: Braunschweig; Starting date (earliest): At the earliest possible; Remuneration: EG 13 TV-L; Closing date: 22/02/26

Tasks

We invite applications for a PhD or researcher position in the group of Prof. C. Mengert-Dietrich at the TU Braunschweig. The position is offered for an initial period of three years and provides the opportunity to pursue a doctoral degree.

The PhD candidates will conduct studies within the context of the Cumulus project. In collaboration with the Technical University of Munich (TUM), the project aims to deeply integrate an operating system kernel with a database management system, specifically focusing on the cloud as an execution environment. Since the cloud and the database-as-a-service model make custom OS kernels realistic, we investigate specialized architectures like Unikernels. By relying on a single address space and eliminating costly process isolation, we aim to eliminate system call overheads and provide direct hardware access. This allows us to revisit dated POSIX APIs and develop novel abstractions for high-performance cloud-native data processing systems. The following papers give more context and our vision:

- Virtual-Memory Assisted Buffer Management, Viktor Leis, Adnan Alhomssi, Tobias Ziegler, Yannick Loeck, Christian Dietrich, Proceedings of the ACM SIGMOD/PODS International Conference on Management of Data ACM, 2023.
- Cloud-Native Database Systems and Unikernels: Reimagining OS Abstractions for Modern Hardware [Vision], Viktor Leis, Christian Dietrich, Proceedings of the 50th International Conference on Very Large Data Bases VLDB Endowment, 2024.

In addition to gaining insights and having a lot of fun along the way, the goals of these studies are to advance the candidate’s dissertation project and publish research results at top international conferences.

If you have already completed your PhD, the position can also be filled as a post-doctoral position.

Your Tasks
The following incomplete list is meant to provide an overview of the tasks for PhD candidates. In all tasks, you won’t be working alone but will receive strong support from the other members of the research group and Christian Dietrich

Independent research within the research projects of the group. This includes:

- Planning concrete research projects
- Conducting literature reviews and analyzing the state of the art
- Developing suitable prototypes and conducting measurements
- Writing scientific papers
- Engaging with the scientific community (e.g., attending conferences)
  Teaching activities within the courses offered by the group:
- Organizing and conducting courses
- Leading tutorials and seminars
- Answering students’ questions
- Supervising Bachelor’s and Master’s theses.

Requirements

- Academic Degree: University degree (M.Sc.) in computer science or an equivalent field.
- Expertise: Knowledge in at least one of the following areas: operating systems, system software, compilers.
- Programming Skills: Strong programming skills, especially in low-level languages (C, C++, Rust).
- Language Skills: Proficiency in German and English, suitable for teaching in German and writing scientific papers in English.
- Teamwork: Enjoy working in a group and a desire to collaborate with other researchers.
- Practical Orientation: Motivation to develop real-world systems.

What we offer

- Innovative Research Environment: Work in a dynamic and young research group, access to cutting-edge technologies, and networking with research partners from other universities.
- Participation in International Leading Research: Demonstrated by numerous international publications and involvement in a DFG priority program, the research group is at the forefront of technological advancements.
- Support for Your Dissertation: Intensive supervision of the research projects and publications, as well as guidance in the preparation of the final dissertation.
- Professional Development: Opportunities for professional and personal growth through workshops, seminars, and conferences. Mentoring student assistants provides a chance to develop leadership skills.
- Academic Networking: Integration into a broad network of scientists. Attending conferences allows you to build your own professional network.
- Personal Benefits: Competitive compensation (according to TVL-E13), flexible working hours, and access to additional university resources (e.g., library, sports facilities, etc.).

Application

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.

More information at https://stellenticket.de/200973/TUB/
Offer visible until 22/02/26