

Technische Universität Braunschweig - Institut für Neuromorphic Computing



Technische Universität Braunschweig is one of Germany's leading universities of technology. With more than 15,000 students and around 3,800 employees in research, teaching, and administration, it offers an exciting and diverse working environment. Our research focuses on mobility, engineering for health, metrology, and the city of the future. Many of today's most exciting computational problems — from combinatorial optimization and probabilistic AI to machine reasoning under uncertainty — can only be solved on classical, deterministic computer architectures at enormous energy cost. Probabilistic computing takes a radically different approach: computing with intrinsically stochastic devices and architectures, such as p-bit-based Ising machines, which can be built on novel spintronic devices (e.g., stochastic magnetic tunnel junctions, SMTJs). The Institute of Neuromorphic Computing (head: Prof. Dr. Thomas Kämpfe) designs and optimizes analog, mixed-signal, and digital integrated circuits in advanced CMOS technologies (e.g., FDSOI) for highly energy-efficient, brain-inspired computing systems — from in-memory computing and neuromorphic AI accelerators to hyperdimensional and probabilistic computing. In close collaboration with renowned German and European partners from science and industry, including Fraunhofer IPMS, we take our designs all the way to fabricated silicon (tape-out). Starting from the earliest possible date we are looking for a Research associate (m/w/d) focusing on architecture design and digital circuit design for probabilistic computing

Research associate (m/w/d) focusing on architecture design and digital circuit design for probabilistic computing

(EG 13 TV-L - full-time/part-time) The position is suitable both for PhD candidates (with the clear goal of obtaining a doctorate) and for postdoctoral researchers. The position is initially a two-year fixed-term contract, with the intention of extending it. The fixed-term employment relationship is governed by the German Academic Fixed-Term Contract Act.

City: Braunschweig; Starting date (earliest): At the earliest possible; Duration: 2 Jahre;
Remuneration: EG 13 TV-L; Closing date: 06/08/26

Tasks

- Research and design of computer architectures for probabilistic computing (e.g., p-bit-based Ising machines, sampling accelerators for Bayesian inference, stochastic computing)
- Development of the system architecture and breakdown of requirements into functional blocks
- RTL design (VHDL, Verilog/SystemVerilog) of digital circuit blocks, including true and pseudo-random entropy sources, coupling and update networks, and their system-level integration
- Co-design with novel stochastic devices — in particular spintronic devices such as stochastic magnetic tunnel junctions (SMTJs) — in collaboration with technology and device partners
- Modeling and simulation across abstraction levels (device – circuit – architecture –

- algorithm) as well as benchmarking against classical solvers and accelerators
- Verification (test benches, RTL and timing simulations, code coverage), FPGA emulation, and ASIC implementation up to tape-out and silicon characterization
- Preparation of design documentation and publication of results in peer-reviewed journals and at international conferences
- Contribution to the institute's teaching activities (exercises, lab courses, supervision of student theses); as a postdoc, additional involvement in project acquisition and co-supervision of PhD candidates.

Requirements

- Completed scientific university degree (Master's or Diplom) in electrical engineering, electronics, information technology, physics, computer science, or a comparable field; for an appointment as a postdoc, additionally an excellent doctorate in a relevant area
- Experience in architecture and/or RTL design (VHDL, Verilog/SystemVerilog) and ideally in FPGA design (e.g., AMD/Xilinx, Intel/Altera, Lattice)
- Solid understanding of probability theory and stochastic processes, or the willingness to quickly acquire it
- Experience with spintronic devices or MRAM/MTJ technology is a particular plus, as is expertise in at least one of the following areas: Ising machines/combinatorial optimization, Bayesian methods, Monte Carlo techniques, emerging memory technologies
- Knowledge of synthesis and physical design tools (e.g., Design Compiler, Cadence Innovus) is an advantage
- Strong analytical skills, the ability to quickly adapt to new technical and scientific contexts, and the ability to independently drive complex design efforts
- High motivation to publish scientific results in peer-reviewed journals and to present at international conferences
- Good written and spoken English as the basis for working in an international team; German language skills are an advantage.

What we offer

- Varied and topical research work at one of Germany's leading technical universities with access to state-of-the-art EDA tools and regular tape-out opportunities
- The opportunity to pursue a doctorate with intensive scientific supervision or — as a postdoc — to further develop your scientific profile
- Remuneration in accordance with salary grade EG 13 TV-L, including an annual special payment and occupational pension scheme (VBL), plus 30 days of vacation per year
- Flexible working hours, part-time models, and the option of mobile working
- A family-friendly university culture (audited as a family-friendly university since 2007)
- A wide range of internal and external professional development opportunities and an extensive university sports program.

Application

We welcome applicants of all nationalities. We also welcome applications from severely disabled persons, who will be given preference in the case of equal suitability. Please indicate this in your application and enclose appropriate proof. TU Braunschweig works to fulfill its equality mandate on the basis of the Lower Saxony Equal Rights Act (NGG); applications from women are therefore particularly welcome.

By submitting your application, you consent to your personal data being stored and processed for the purpose of the selection procedure.

Unfortunately, application costs cannot be reimbursed.

Application and Contact

Please send your complete application (cover letter, CV, transcripts/certificates, and — if applicable — a list of publications) by 06 August 2026, quoting the keyword "ProbComp", as a single PDF file by email to:

Prof. Dr. Thomas Kämpfe
thomas.kaempfe(at)tu-braunschweig.de

Technische Universität Braunschweig
Institute of Neuromorphic Computing
Spielmannstr. 11a
38106 Braunschweig, Germany

For questions regarding the position, please contact Prof. Dr. Thomas Kämpfe.

More information at <https://stellenticket.de/205908/HTWB/>
Offer visible until 06/08/26

