TUD Dresden University of Technology, as a University of Excellence, is one of the leading and most dynamic research institutions in the country. Founded in 1828, today it is a globally oriented, regionally anchored top university as it focuses on the grand challenges of the 21st century. It develops innovative solutions for the world's most pressing issues. In research and academic programs, the university unites the natural and engineering sciences with the humanities, social sciences and medicine. This wide range of disciplines is a special feature, facilitating interdisciplinarity and transfer of science to society. As a modern employer, it offers attractive working conditions to all employees in teaching, research, technology and administration. The goal is to promote and develop their individual abilities while empowering everyone to reach their full potential. TUD embodies a university culture that is characterized by cosmopolitanism, mutual appreciation, thriving innovation and active participation. For TUD diversity is an essential feature and a quality criterion of an excellent university. Accordingly, we welcome all applicants who would like to commit themselves, their achievements and productivity to the success of the whole institution.

At the **Faculty of Computer Science, Institute of Computer Engineering**, the **Chair of Compiler Construction** offers a project position, subject to the availability of resources, in the context of the **REACT MSCA Doctoral Network** as

Research Associate / PhD student (m/f/x)
(You will receive a salary according to MSCA regulation, including a living allowance, a mobility allowance and a family allowance (if eligible))

starting **November 1, 2025.**

Research areas: **DC7: Programming models and high-level compilation for near-sensor dataflow execution under security constraints**

Terms: The position is limited to 3 years max. until October 31, 2028 with the option of extension. The period of employment is governed by § 2 (2) Fixed Term Research Contracts Act (Wissenschaftszeitvertragsgesetz – WissZeitVG).

REACT MSCA Doctoral Network: Self-awareness in humans is an innate capability, arising from the brain's ability to process a multitude of sensory inputs. Emulating this functionality in electronic systems—commonly referred to as neuromorphic computing—holds the potential to create highly intelligent machines capable of supporting a wide range of everyday applications, from autonomous vehicles to smart navigation systems. However, realizing neuromorphic computing in practice presents significant challenges, particularly in the areas of energy efficiency, reliability, and security.

The REACT MSCA Doctoral Network addresses these challenges by developing a neuromorphic platform that is inherently self-aware in terms of energy consumption, secure operation, and system reliability. As part of this initiative, 15 early-stage doctoral candidates (DCs) will be trained through a comprehensive, interdisciplinary program spanning material science, device physics, computer architecture, hardware prototyping, compiler design, simulation and emulation tools, as well as cybersecurity, reliability, and system verifiability.

REACT offers a uniquely structured training environment, combining academic excellence with industrial collaboration. DCs will benefit from close mentorship by leading researchers and industry

experts, while also developing essential skills in scientific writing, research ethics, time management, and entrepreneurship. By the conclusion of the REACT project, participants will be well-equipped to pursue impactful careers across academia and industry, with the REACT program serving as a strong foundation for their future success.

Position and Requirements: At the Chair of Compiler Construction, we have a long-term vision of shaping how future electronic systems are programmed. This includes defining novel programming methods and compiler infrastructures to deploy reactive applications that execute close or at sensing nodes in cyber-physical systems (CPS). We built on prior work on MLIR to create a code generation framework that optimises not only for performance and energy efficiency, but also for reliability and security concerns identified in the REACT Doctoral Network. In this context, we seek a highly motivated researcher with a proven track record in parallel programming models for CPS, high-level compilers, system and computer architecture and automatic code optimization. The selected candidate will be able to work on cutting-edge innovations, leveraging the ample and interdisciplinary expertise of the REACT partners. The candidate will also profit from the vibrant research community around machine learning of the SCADS.AI center (https://scads.ai) and the recently granted Excellence Cluster REC² – Responsible Electronics in the Climate Change Era.

We aim to attract the best talent in the respective research fields and expect the following:

- an outstanding university degree in computer science, mathematics, electrical engineering, or a relevant area;
- research experience, preferably in programming languages, compilers, applied mathematics, and optimization techniques;
- background in compiler, code generation, frameworks for CPS programming;
- an independent, target- and solution-driven work attitude;
- inter- and multidisciplinary thinking;
- an integrative and cooperative personality with excellent communication and social skills;
- fluency in English - written and oral;
- knowledge of compiler frameworks such as LLVM IR or MLIR is highly beneficial.
- **MSCA Doctoral Network Mobility Rule**: Candidates must not have resided or carried out their main activity in "**host country**" **(Germany)** for more than 12 months in the 3 years immediately before the recruitment date.
- **MSCA Doctoral Network PhD Rule**: Candidates must not already possess a doctoral degree at the date of recruitment and must be within 4 years (full time equivalent) of his/her research career (e.g., after finishing a master's degree). The candidate must be accepted into a doctoral program.

Informal enquiries can be submitted to Prof. Dr.-Ing. Jeronimo Castrillon, Tel +49 (351) 463 42716; Email: jeronimo.castrillon@tu-dresden.de.

What we offer: You will join a team of enthusiastic researchers who creatively pursue their research agenda.

TUD strives to employ more women in academia and research. We therefore expressly encourage women to apply. The University is a certified family-friendly university. We welcome applications from candidates with disabilities. If multiple candidates prove to be equally qualified, those with disabilities or with equivalent status pursuant to the German Social Code IX (SGB IX) will receive priority for employment.

Please submit your detailed application (in English only) including motivation letter, CV, copy of degree certificate, transcript of grades (i.e., the official list of coursework including your grades) and proof of English language skills by **August 14, 2025** (stamped arrival date of the university central mail service of TUD applies) **directly via the REACT website under https://project-react.eu/vacancies/** or to: **TU Dresden, Chair of Compiler Construction, Prof. Dr.-Ing. Jeronimo Castrillon, Helmholtzstr.**

10, 01069 Dresden, Germany. Please submit copies only, as your application will not be returned to you. Expenses incurred in attending interviews cannot be reimbursed.

Reference to data protection: Your data protection rights, the purpose for which your data will be processed, as well as further information about data protection is available to you on the website: https://tu-dresden.de/karriere/datenschutzhinweis.