

Faculty of Computer Science

At the **Institute of Computer Engineering** the **Chair of Compiler Construction** offers a fixed-term project position starting **May 1, 2022** as

Research Associate

(subject to personal qualification employees are remunerated according to salary group E 13 TV-L)

Research area: **Compiler representations and optimization for systems with emerging memory technologies**

Terms: The position is limited to **February 29, 2024** (with the option to be extended – subject to further third-party funded projects). The period of employment is governed by the Fixed Term Research Contracts Act (Wissenschaftszeitvertragsgesetz – WissZeitVG).

Position and Requirements

At the Chair of Compiler Construction we have the long-term vision of shaping the way future electronic systems are to be programmed. This includes defining novel programming abstractions by means of domain-specific languages and associated compiler infrastructures to enable optimising software for large-scale heterogeneous and distributed computing systems. In this context, we are looking for a highly motivated researcher to work on high-level optimizations for systems with emerging memory technologies. This involves aspects of data placement for systems that combine mainstream memories (SRAM and DRAM) with emerging memories (spin-torque-transfer-RAM, phase change memory and racetrack memories), and also novel techniques to effectively exploit computation-in-memory and computation-near-memory. The selected candidate will work with state-of-the-art compiler frameworks (LLVM, MLIR, and Pluto), and memory and system simulators. The long term goal is to create abstractions than can be extended and re-used for systems beyond those addressed in the project.

We aim at attracting the best talent in the respective research fields and expect the following:

- an outstanding university degree (master/diploma or equivalent) in computer science, mathematics, electrical engineering or a relevant area;
- first research experience, preferably in compilers, applied mathematics (e.g., graph algorithms), optimization techniques, polyhedral compilers;
- sound knowledge in computer architecture;
- knowledge of LLVM IR and MLIR are highly beneficial;
- 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.

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

Applications from women are particularly welcome. The same applies to people with disabilities.

What we offer

You will join a team of enthusiastic researchers who pursue creatively their individual research agenda. The chair is a part of the "Center for Advancing Electronics Dresden", which offers plenty of resources and structures for career development.

Application Procedure

Complete applications (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 should be submitted preferably via the TU Dresden SecureMail Portal <https://securemail.tu-dresden.de> by sending it as a single pdf document quoting the reference number **PhD2202-CCC** in the subject header to recruiting.cfaed@tu-dresden.de or alternatively by post to: **TU Dresden, Fakultät Informatik, Institut für Technische Informatik, Professur für Compilerbau, Herrn Prof. Jeronimo Castrillon, Helmholtzstr. 10, 01069 Dresden, Germany.** The closing date for applications is **March 15, 2022** (stamped arrival date of the university central mail service applies). 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>

About cfaed

The cfaed is a cluster which brings together 200 researchers from TU Dresden and ten other research institutions in the areas of Electrical and Computer Engineering, Computer Science, Materials Science, Physics, Chemistry, Biology, and Mathematics. The cfaed addresses the advancement of electronic information processing systems through exploring new technologies which overcome the limits of today's predominant CMOS technology. www.tu-dresden.de/cfaed



About TU Dresden

The TU Dresden is among the top universities in Germany and Europe and one of the eleven German universities that were identified as an 'elite university' since 2012. As a modern full-status university with 17 faculties it offers a wide academic range making it one of a very few in Germany.