IHP GmbH - Leibniz-Institut für innovative Mikroelektronik

Das IHP ist ein Institut der Leibniz-Gemeinschaft und betreibt Forschung und Entwicklung zu siliziumbasierten Systemen, Höchstfrequenz-Schaltungen und -Technologien einschließlich neuer Materialien. Es erarbeitet innovative Lösungen für Anwendungsbereiche wie die drahtlose und Breitbandkommunikation, Sicherheit, Medizintechnik, Industrie 4.0, Mobilität und Raumfahrt. Das IHP beschäftigt ca. 330 Mitarbeiterinnen und Mitarbeiter. Es verfügt über eine Pilotlinie für technologische Entwicklungen und die Präparation von Hochgeschwindigkeits-Schaltkreisen mit 0,13/0,25 µm-BiCMOS-Technologien, die sich in einem 1000 m² großen Reinraum der Klasse 1 befindet.

Research Assistant / PhD position (m/f/d) for Embedded Software Design for Heterogeneous AI Platforms with location in Cottbus

Job-ID: 3033/26 | Department: System Architecture | Working Time: 40h/week| Salary: E13 TV-L | Limitation: 2 years with option of extension | Entry Date: as soon as possible | Location: Cottbus

City: Frankfurt (Oder); Starting date (earliest): At the earliest possible; Remuneration: TV-L

Tasks

We are looking for a motivated PhD candidate to join the System Architectures Department. The research focus is on compiler and toolchain development for a heterogeneous embedded edge platform combining RISC-V-based processors, FPGAs, and custom accelerators. The platform integrates conventional and non-conventional AI accelerators — including emerging technologies beyond CMOS — and a key challenge is mapping and scheduling application workloads across these components at the compiler and runtime level. While RISC-V is our current baseline, the flow should not be limited to a single ISA or platform.
This position offers a deep insight into the programming of state-of-the-art hardware systems. It is anticipated the candidate will work towards a PhD. Your detailed tasks will include:

- Compiler backend development and toolchain integration for a custom embedded target platform
- Mapping and scheduling of application workloads onto heterogeneous processor-accelerator architectures
- Integration of accelerators and application-level inference pipelines into the software stack at the operator and runtime level
- Hardware-independent development and testing using ISA simulators (e.g. QEMU, Spike)
- Co-design support: accelerator selection, interface specification, and dimensioning in collaboration with hardware teams
- Continuous integration and deployment of hardware and software IP

Requirements

You hold a Master's degree in Computer Science, Electrical Engineering, or a related field. You have strong foundations in compiler construction (e.g. LLVM, code generation, intermediate representations) and proficiency in C/C++ and Python. Familiarity with MLIR or TVM is a plus. You are comfortable working close to hardware and understanding system-level constraints. Familiarity with embedded or bare-metal targets is a plus, as is experience with heterogeneous computing concepts such as operator scheduling or memory hierarchies. Knowledge of hardware description or simulation environments is beneficial.
You will also be a strong team player. We are looking for a team member who can structure their own work and bring a well-organized and systematic approach to working with creative minds. You will be an ideal fit for this position if you have experimental, analytical, and problem-solving skills, very strong communication skills, and the ability to quickly learn how to use the latest technical equipment, including various software. You must be fluent in English. German language skills are welcome. Further development of German language skills is expected and strongly encouraged, e.g. through in-house language courses and intensive courses.

What we offer

Conduct research in a challenging, multinational environment giving you excellent career opportunities. You will have the chance to establish international reputation at the edge of top-notch technologies.
It is important to us to support the individual career developments (e.g. conferences, advanced trainings) as well as the personal needs of our employees by offering flexible working hours and the possibility to work off-site. The compatibility of work and family is highly valued. More information about our scientific excellence and the working environment at IHP can be found on our website.
IHP is TOTAL E-QUALITY-certified for equal opportunities for women and men at work and actively pursues the equality of all gender and all groups of people. We promote the professional development of women and strongly encourage them to apply. Disabled applicants, qualified according to the above criteria, will be given preference over other candidates with equivalent relevant qualifications.

Further advantages:
30 days holiday | special annual payment | Company pension scheme (VBL) | Flexible working hours, also part-time (no core working hours) | Possibility to work up to 40 % independent of location according to company agreement | A wide range of further training opportunities in-house or within the framework of business trips | Discounted company ticket with monthly allowance of € 15,75 for various fare zones | Good transport connections, free parking at the institute | Structured induction and actively supported integration into the institute (welcome workshop, intercultural workshop, joint leisure activities)

Application

Contact person: Markus Ulbricht

By internet: https://www.ihp-microelectronics.com/career/vacancies/online-application-form?job=3033/26

More information at https://stellenticket.de/204198/BEUTH/
Offer visible until 17/06/26