



Master thesis “Firmware for a RRAM-based Neural Accelerator Evaluation Platform” (m/f/d)

Job-ID: 5097/23 | Dept.: Circuit Design | Limitation: 6 months with option of extension | Entry Date: as soon as possible

We offer the possibility to work parallel as a student or research assistant, with a working time of max. 19h per week, remuneration according to the guidelines of the state of Brandenburg on the working conditions of research and student assistants.

IHP is an institute of the Leibniz Association and conducts research and development of silicon-based systems and ultra high-frequency circuits and technologies including new materials. It develops innovative solutions for application areas such as wireless and broadband communication, security, medical technology, industry 4.0, automotive industry, and aerospace. IHP employs approximately 380 people. It operates a pilot line for technological developments and the preparation of high-speed circuits with 0.13/0.25 μm -SiGe-BiCMOS technologies, located in a 1500 m² cleanroom that meets the highest industrial nanotechnology requirements.

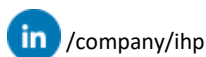
The position:

In-Memory computing for neuromorphic edge applications is an emerging field of research which enables to outperform conventional computational architectures in terms of speed and power efficiency. IHP's SiGe-BiCMOS technology with the RRAM back end of line option is predistened to build neural hardware accelerator ICs. Three of such neural ICs have been designed, produced and combined on a hardware evaluation platform representing the layers of an ANN architecture.

The goal of this project is to implement a firmware on an ARM-based microcontroller to learn and infer those three cascaded ASICs. For this, peripherals of the microcontroller have to be used to address a state-of-the-art pulsed programming unit. The software has to enable the user to program, test and measure the complete neural network application.

Your tasks:

- Implementation of a firmware on an ARM-based microcontroller platform for a RRAM neural hardware accelerator
- Software implementation of communication protocols like SPI and I2C, as well as peripheral configuration like ADCs/DACs
- Development of a user interface for measurement purposes
- After successful completion of the master thesis project, a PhD degree can be pursued and will be encouraged.





Your qualifications:

- Bachelor's degree in the field of electrical engineering
- Good knowledge of analog and digital circuits
- Fundamental hands-on experience in the design and simulation of integrated circuits using CAD tools (Cadence Virtuoso, Spectre) would be desirable
- Very good English language skills.

Our Offer:

You have the possibility to work in a dynamic and multinational research institute for microelectronics and to gain insights into the work of renowned scientists in future-oriented research projects. During your stay at IHP, you will have 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.

Your application:

Have we sparked your interest? Then we look forward to receiving your application via our [online application form](#).

For further information regarding the position please contact Mr. Ostrovskyy : career@ihp-microelectronics.com.