PhD and PDEng Positions in Ultra-Low-Power Baseband Processing with Adequate Computing

Staff Category: PhD-student and PDEng student  
Department: Department of Electrical Engineering  
Full time equivalent (FTE): 1.0  
Starting date: As soon as possible  
Number of positions: 1 PhD position + 1 PDEng position  
Application closing date: May 8, 2016  
Application number: V36.2554

Eindhoven University of Technology

Eindhoven University of Technology (TU/e, www.tue.nl), founded in 1956, is a world-leading research university specializing in engineering science & technology. The Department of Electrical Engineering is responsible for research and education in Electrical Engineering. The TU/e is the world’s best-performing research university in terms of research cooperation with industry (#1 since 2009).

PhD and PDEng positions in the QoS-Adequate Baseband Radio Processing (QoS-AB) project

A variety of self-sustaining systems based on intelligent sensor nodes is emerging in different application domains. Smart sensor devices connect to each other and are accessible from anywhere, forming an Internet-of-Things (IoT). The design of robust and energy efficient intelligent sensors is critical for IoT applications. QoS-AB will provide ultra-low-power wireless communication solutions that are configurable for different IoT application domains with different Quality-of-Service (QoS) requirements. Ultra-low-power baseband processors for the IEEE 802.15.4 and WiFi standards will be developed with adequate computing paradigms.

In this project, the Electronic Systems group of Eindhoven University of Technology collaborates with NXP for the chip development. We have one opening for a PhD position and one opening for a PDEng position.

- The PhD student is expected to research the architecture and the digital circuit techniques for baseband processing by using the concept of adequate computing.
- The PDEng student will participate in both the front-end and back-end design of the chip and system development.

The two students are expected to work closely together to develop the baseband processors for demonstration. Both students will be supervised by Prof. dr. Twan Basten, Prof. dr. José Pineda de Gyvez, Dr. Hailong Jiao, and Dr. Majid Nabi Najafabadi.

Requirements

We look for excellent candidates who meet the following requirements.

- A master degree in Electrical Engineering, Computer Engineering, or a similar relevant programme.
- Knowledge of VLSI circuit design and familiarity with state-of-the-art EDA tools for digital circuit design (such as Cadence Virtuoso, RTL Compiler, and SoC Encounter, or equivalent).
- For the PhD candidate, knowledge of digital communication, especially experience with IEEE 802.15.4 and/or WiFi. For the PDEng candidate, experience with digital communication is considered as a plus.
- Preferably familiarity with Matlab and script languages (such as Perl or Python).
- Preferably good programming skills in C.
- Good communication skills. Excellent proficiency in written and spoken English.
- Highly motivated, team player.

You should be eager to push the state-of-the-art, and to demonstrate your research with working prototypes and publications in top conferences and journals.

**What we offer for the PhD position**

We offer a challenging job at a respected university through a fixed-term appointment for 4 years. The research during this period is intended to lead to a PhD degree. We offer a salary starting at **Euro 2174** per month (gross) in the first year, increasing up to **Euro 2779** per month (gross) in the last year. Moreover, an 8% bonus share (holiday supplement) is provided annually. Assistance for finding accommodation can be given. The university offers an attractive package of fringe benefits such as excellent technical infrastructure, child care, savings schemes, and excellent sports facilities.

TU/e also offers you the opportunity for personal development by developing your social and communication skills. We do this by offering every PhD student a series of courses that are part of the Proof program as an excellent addition to your scientific education.

**What we offer for the PDEng traineeship**

We offer a challenging traineeship at a respected university through a fixed-term appointment for 2 years. During the traineeship you follow an individual program, consisting of courses, workshops, assessments, and industrial projects (in collaboration with NXP, [www.nxp.com](http://www.nxp.com)), deepening the theoretical knowledge gained during your university studies. The traineeship is intended to lead to a PDEng (Professional Doctorate in Engineering) degree (see [https://www.tue.nl/en/education/tue-graduate-school/pdeng-programs/](https://www.tue.nl/en/education/tue-graduate-school/pdeng-programs/)) in the DEES-ICT program. We offer a salary starting at **Euro 1789** per month (gross). Moreover, an 8% bonus share (holiday supplement) is provided annually. Assistance for finding accommodation can be given. The university offers an attractive package of fringe benefits such as excellent technical infrastructure, child care, savings schemes, and excellent sports facilities.

**Application procedure**

Applications must be submitted through the link available at


Please submit at least the following information (**only pdf files are accepted**):

1. Cover letter, including availability (starting date), and statement of research interests.
2. Curriculum vitae, including full education and employment histories, publication record, proof of proficiency in English, any teaching experience, and the names of at least three references that can be contacted.
3. Scans of certificates showing BSc, MSc, and other courses followed, with grades and rankings.
4. Up to two selected publications (e.g. MSc thesis, conference paper) in English of which you are the first or main author.

**More information**

For more information about the advertised positions, please contact:

Prof. dr. Twan Basten, A.A.Basten@tue.nl

Prof. dr. José Pineda de Gyvez, J.Pineda.de.Gyvez@tue.nl
**Electronic Systems group at the TU/e**

The Electronic Systems (ES) group ([www.es.ele.tue.nl](http://www.es.ele.tue.nl)) comprises three full professors, two part-time full professors, two associate professors, six assistant professors, about 40 PhD candidates and postdocs, and several technical and support staff. The group has excellent infrastructure that includes individual computers, servers, state-of-the-art FPGA and GPU farms, sensor- and ad-hoc networking equipment, and a comprehensive range of electronic-design software. The group is member of Europractice and CMP, having access to advanced CMOS technologies down to 28nm. The group is authorized user of ARM DesignStart design suite, and has acquired the ARM Cortex-M0 processor IP from ARM.

The ES group is world-renowned for its design automation and embedded systems research. It is our ambition to provide a scientific basis for design trajectories of digital electronic circuits, embedded and cyber-physical systems. The ES group excels in the area of digital VLSI circuit and system design. A variety of state-of-the-art chips have been developed by our ES group together with our industrial partners, such as NXP Semiconductors and IMEC-Holst Centre.