Funded PhD Student Position

Efficient Baseband Processing Architectures for Next Generation Communication Systems

Institute of Sensors, Signals and Systems, School of Engineering and Physical Sciences, Heriot-Watt University, Edinburgh, UK.

Project Description

As we continue to push the boundaries of wireless communication technology, the evolution of next generation communication systems such as 6G presents exciting challenges and opportunities. One of the key areas of focus in this advancement is the development of efficient baseband processing architectures. Baseband processing plays a critical role in shaping the performance and capabilities of communication systems, influencing factors such as data throughput, energy efficiency, latency and overall system reliability.

The proposed PhD research aims to address the critical need for efficient baseband processing architectures in next-generation communication systems like 6G. Baseband processing is pivotal for enhancing communication system performance, impacting factors such as data throughput, energy efficiency, latency, and overall reliability. This study will delve into optimizing baseband processing algorithms by exploring innovative techniques from machine learning, parallel computing, and hardware acceleration. The objective is to design architectures capable of meeting the stringent demands of emerging communication standards while prioritizing energy efficiency and cost-effectiveness. By tackling these challenges, this research seeks to significantly contribute to advancing communication systems, enabling faster, more reliable, and scalable wireless networks.

The recruited student is expected to immediately start working on the above, based on the strong background framework and plan of action laid by the supervisor Dr. Tasleem Khan, and will make use of the excellent state-of-the art resources available at the School of Engineering and Physical Sciences, at Edinburgh campus. The resources include advanced wireless communication laboratory (with FPGA boards, EDA tools, modern VNAs, VSGs, VSAs, source-meters, anechoic chambers, micro probing facilities, and similar), microfabrication clean room, semiconductor parameter analysers, sophisticated imaging & material analysis tools like SEM/EDAX, XRD, high-resolution optical microscopes, etc., to mention a few. This research and the supervisor have close collaboration and will be supported by several renown faculty and industrialists at Heriot-Watt Univ., UK, and abroad such as Linkoping University (Sweden) and Johannes Kepler Universitat (Austria).

Scholarship: £17,668 P.A. + tuition fees waived (eligible students are exempted from income and council taxes).

Duration: 42 Months**.**

Location: Heriot-Watt University, Edinburgh Campus, UK.

Deadline: Position is available untill filled.

Supervision team

Dr. Mohd Tasleem Khan, Assistant Professor, Heriot-Watt University will be the first supervisor of the student throughout this PhD program.

Release date: April 2024.

Dr. Yuan Ding, Associate Professor, Heriot-Watt University, with exemplary experience and expertise in wireless communications will be a co-supervisor and support the student in allied areas.

Prof. George Goussetis, Professor, Heriot-Watt University, an eminent academician, and scientist, with expertise in wireless communications and microwave engineering, and similar will co-supervise the student in relevant domains.

To apply please send your motivation letter, CV, and recommendation letters (optional) to M.T.Khan@hw.ac.uk. Feel free to reach if you have questions.

Candidate description and eligibility

A highly motivated candidate with an MEng (or M.Tech)/BEng (or B.Tech) degree or equivalent in electronics and/or electrical engineering, with a strong passion for VLSI for Communication, DSP and Machine Learning/AI is sought herewith.

Desirable: In addition to above qualifications, expertise and interest in FPGA and EDA tools would be advantageous.

Funding notes

Essentially UK based students are supported in this scheme, however international students are also encouraged to apply and maybe considered in absence of UK students with a good match to the project. International students please see English language requirements for EU/overseas applicants: https://www.hw.ac.uk/study/entry/english-language-requirements.htm

Final terms and conditions of the studentship is subject to be confirmed with the Heriot-Watt University HR department once the final shortlisting and interview is held.

Other benefits: Heriot-Watt University Edinburgh campus is a vibrant social community in addition to great research and learning atmosphere, and provides several outstanding facilities, including for healthcare, sports, and social well-being. Please visit for more information: https://www.hw.ac.uk/uk/edinburgh/facilities.htm