

Dr Jalal Bagherli PhD Studentships in ADAPTIVE EMBEDDED HARDWARE SYSTEMS for NET ZERO 2024-25

The CO₂ emissions from manufacture (the so-called embodied carbon) of end-user ICT devices makes up the majority of their carbon footprint over the typical current useful life of such devices. To achieve sustainable ICT, in addition to reducing run time energy consumption, it is therefore essential to extend the active life, ideally to several decades.

These two PhD projects aim to develop a novel adaptive embedded hardware system, which will be equipped with a low-level hardware monitoring system together with a multi-level self-healing and diagnostics capabilities for adaptation of embedded software and hardware during run-time. Our vision with this project is to demonstrate the possibility of extending the lifetime of IoT devices from several years to several decades through a combination of novel hardware/software co-design approach and machine learning based self-healing techniques.

The proposed projects will not only be providing the ability to reliably operate the embedded systems in complex practical environment with cost-effective manner, but also accurately assess the degradation of any given device, enabling the repurposing of devices with reduced capabilities for new tasks, therefore, it will enable a drastic reduction in the embodied carbon of IoT devices, and the Circular Economy, as our technology will allow devices to be repurposed repeatedly throughout their useful life.

The successful applicant will receive a full PhD Studentship, including full tuition fee discount for three years of study, a stipend payment towards your living costs and Proficio funding towards training, conferences, and travel.

Full funding Studentship available is as outlined below.

Type of award	Funding available
Full-funding award	<ul style="list-style-type: none">■ Home or Overseas tuition fee waiver.■ Living costs stipend at the UK Research and Innovation recommended level per year. The stipend amount for 2024-25 is £19,237

About the Embedded and Intelligent Systems (EIS) Laboratory:

As a member of the Embedded and Intelligent Systems Laboratory at the University of Essex, the student will get access to the state-of-the-art of SoC devices and development as well as the data obtained from previous radiation chip tests undertaken as part of the Robotics and AI hub work and collaboration with advanced robotics group at NASA JPL. The student will have access to the irradiation facilities available to the University of Essex, at RAL, the Dalton Institute and NASA JPL to support their work.

We carry out research in the areas of Embedded Systems and System-on-Chip design with a focus on security, power, performance and reliability, advanced embedded systems and processor architectures targeted for cyber physical systems, automotive/industrial, robotics, image processing, networked and distributed sensor nodes/Internet of Things and real-time critical systems. We have successfully pioneered what is now an industry leading solution with the technology for UltraSoC and Metrarc. Details about the research group and projects can be found in <https://eis.essex.ac.uk/>.

About the School of Computer Science and Electronic Engineering (CSEE):

CSEE <https://www.essex.ac.uk/departments/computer-science-and-electronic-engineering> ranked 6th in the UK's REF2021 assessment of research excellence for Computer Science research power and 9th for impact. Within the CSEE, the Robotics and Embedded System (RES) research group is one of the largest and best-equipped labs. The RES research group is a founding member of two major UKRI research centres: the £42M EPSRC National Centre for Nuclear Robotics (NCNR) and the ESRC Business and Local Government Data Research Centre (with the AI group).

About Dr Jalal Bagherli

Dr Bagherli spent 16 years as chief executive of Dialog Semiconductor, a specialist chip company in mixed signal connectivity and power management products for mobile and IoT devices. A University of Essex graduate, his companies have won multiple major industry awards.

Amongst various other advisory positions, Dr Bagherli now Co-Chairs the UK Semiconductor Advisory Panel, for the Department for Science, Innovation and Technology.

Terms and conditions

Eligibility

- Receipt of the Studentship is subject to applying for PhD Computer science or PhD Electronic Systems. You will need to register as a postgraduate student at the University of Essex for the 2024-25 academic year on a PhD commencing in October 2024 or mutually agreed shortly thereafter, and meeting all conditions of our offer.
- Students must have achieved an honours degree (1st class, or equivalent). A Masters in a relevant subject is desirable (but not essential) and substantive previous professional experience in the relevant area can be counted towards this requirement.
- While this studentship is open to all applicants, we, in particular, encourage applications from female candidates and / or students from less privileged backgrounds from the developing countries in the Middle East and Africa.
- If English is not your first language, you will also need to meet the English language entry requirements for the PhD you have applied for.
- This Studentship is available for **three** years of study.
- These Studentships are restricted to students who would otherwise be entirely self-funded.
- The award cannot be held in conjunction with any other University of Essex Studentships or scholarships.
- Successful applicants should be available for promotional activities.

*Students receiving a repayable loan to fund their studies will be considered as self-funded.

Students who are not eligible

The following students are NOT eligible for this Studentship regardless of meeting the above criteria:

- This Studentship award does not apply to deferred entry. Where a Studentship has been awarded to a student who subsequently defers entry to the following academic year, the award will be withdrawn and the applicant will be considered again in line with the terms and conditions that apply in the new proposed year of entry.
- Students who are fully or partly sponsored.
- Students on a 4-year integrated PhD course.

How to apply

Application closing date: **23rd May 2024**. You can apply for this postgraduate research opportunity [online](#). Applicants should select full-time 'PhD in Computer Science Oct 24' when applying and (when asked for your 'proposed research topic or area of research') state the studentship title at the top of this advert. Applications MUST include the following documents to be uploaded:

- Research proposal of no more than 2 pages (Font 11, Single line spacing), outlining suggested research focus(es), approach(es) and/or studies that applicants would be interested to include within this PhD.
- CV including research experience, skills, and publications (if any).
- Link to a repository (e.g. Github) that evidences your coding project experience.
- Covering letter outlining how you meet the criteria for the studentship.
- Transcripts of any undergraduate or masters' programmes.

Payment arrangements

- The tuition fee discount as part of this Studentship will be made available as a reduction on the tuition fee that is payable on registration at the University. Payment cannot be offset against a tuition fee deposit if one is required.
- If you intermit from your course, you may, at the discretion of the University, be entitled to a pro-rata payment of the remainder of your award on your return to study. Please contact the [Funding Team](#) for further information.
- This Studentship is awarded for each year of study for a period of three years. The fee element will be deducted automatically, and the stipend will be paid in quarterly instalments in October, January, April and July.
- Awards are granted for one year in the first instance but will be renewed, subject to the award holder's satisfactory progress (as defined by the Code of Practice: Postgraduate Research

Degrees), for a second and third year – up to a maximum tenure of nine terms or three years, provided the award holder is still engaged in full-time research (and excepting the circumstances stated in the section on termination).

- Where progress is satisfactory, renewal of the award is automatic. Students who wish to extend their period of study beyond the nine terms will have to meet the additional costs themselves.

Studentship suspension

Students must be registered and meet the above conditions to receive payment. The Studentship will be suspended during a period of approved leave of absence (intermission) where this period covers a whole or part of an academic year and may be reinstated on your return to full-time study subject to the conditions above. On your return to study, you will be entitled to the balance of the Studentship for the stage. There will be no payment for repeat periods of study in any circumstances.

Holiday

Studentship holders are entitled to a maximum of eight weeks' holiday (including bank holidays and the University closure at Christmas) per annum and pro-rata. Holidays should be agreed in advance with the supervisor and, in cases where the awardee is engaged in teaching and demonstrating, with the approval of the head of the student's department, school or centre.

Termination of Studentship

The University will terminate a Studentship when progress or performance is deemed to be unsatisfactory. The Studentship will be terminated if a student ceases to be registered as a student with the University, or for good cause at the discretion of our Dean of Postgraduate Research & Education, or their nominee for this purpose.

If a Studentship is terminated prematurely for any reason, an awardee must repay to the University any monies including maintenance, travel, subsistence, fees overpaid from the date of the termination of the Studentship. If an awardee submits his/her thesis before the end of the Studentship, the Studentship will be terminated on the date of submission. If an awardee takes up full-time employment whilst in receipt of a Studentship, the Studentship will be terminated as of the first day of employment.

Transferability

Due to the nature of the funding, a change of course may result in the termination of the Studentship. Please refer to your supervisor in the first instance. The student is required to continue working on the specified projects to continue receiving the Studentship.

Data Privacy Statement

The University of Essex takes confidentiality very seriously, your application form will only be seen by members of staff involved in processing your application. Information is kept in accordance with the General Data Protection Regulation (GDPR) as it applies in the UK, tailored by the Data Protection Act 2018. Personal data will be used solely for statistical purposes and electronic record keeping and may be made available to authorised University staff to allow statistical information to be analysed.

This data will not be passed to any other third party without your consent, except when the University is required to do so by law. Any formal enquiries concerning the use of data noted here should be addressed to the Head of Student Services.

Resolution of disputes

Acceptance of this award constitutes acceptance of these terms and conditions. Registered students should contact the [Funding Team](#) in the first instance for guidance regarding this award. In cases not covered by the above terms and conditions, or where a student claims exceptional circumstances, or disputes a decision not to make payments due under an award, final appeals on decisions regarding eligibility must be made via the [Student Complaints process](#). The Academic Registrar or their nominee will review the case and his/her decision will be final.

These terms and conditions apply to the academic year 2024-25. The University of Essex reserves the right to update these terms and conditions as necessary.