



Fully Funded PhD Position in the Area of
Game theory-based protocols for resource sharing among massive
number of IoT devices
Department of Electronic Engineering
Maynooth University, Ireland

The Department of Electronic Engineering at Maynooth University is pleased to announce that 1 PhD studentship is available with the start date of early 2022 in **Game theory-based protocols for resource sharing among massive number of IoT devices**.

Open position	1 PhD Studentship in Electronic Engineering/Internet-of-Things/Wireless Networks
Location	Department of Electronic Engineering, Maynooth University
Duration	4 Years
Funding / Stipend	The PhD position is funded for 4 years, including a monthly stipend and a travel budget to present at international conferences, workshops, and seminars. The studentship will include a stipend of €18,500 per annum, €5,500 contribution towards tuition fees, and budget for travel and consumables.
Contact	Dr Indrakshi Dey (indrakshi.dey@mu.ie)
Closing Date	Friday 24 th Dec 2021

General Research Theme of the PhD Projects

The main goal of this project is to investigate and implement new methods to handle and integrate computing resources within massive IoT networks using distributed AI methods; hence targeting energy-efficient network systems. Distributed AI methods combine distribution of intelligence and computational and communication resources among the network nodes by exploiting 'low performance' learning methods, thereby reducing both latency and energy requirements. In this project, distributed intelligence-based resource sharing in massive IoT networks will be achieved by solving two key problems. The first problem is how to optimally allocate computational and communication resources in an online fashion considering the load and energy distribution (across time and space) and computational complexity/cost at the communication hubs. The second problem is how to decide optimally the amount of resources and energy to be allocated to each node at any point of time, when some nodes may have incomplete information about the other nodes in action.

PhD Studentship

The PhD position is funded for 4 years, including a monthly stipend and a travel budget to present the research outputs at international conferences, workshops and seminars. The studentship will include a stipend of €18,500 per annum, €5,500 contribution towards tuition fees, and budget for travel and consumables. The successful candidate will be enrolled on the PhD programme in the Department of Electronic Engineering at Maynooth University. The successful candidate will write their thesis on topics related to Bayesian game theory-based protocols for resource sharing among massive number of IoT devices, supervised by Dr. Indrakshi Dey (Maynooth University) Prof. Subhra Dey (Maynooth University), and Prof. Dirk Pesch (University College Cork) for the entire duration of their PhD programme. The successful candidate will be an integral part of the overall research programme and interdisciplinary team that Dr. Dey, Prof. Dey and Prof. Pesch is leading around the topic of energy sustainability in IoT networks. The successful candidate will be prepared

to work with Dr. Dey's network of collaborators who are among the leading scholars working on state-of-the-art technologies in wireless communications, networking, physics, and mathematics.

In addition to PhD supervision, the successful candidate, where relevant, will benefit from a wide range of training activities, namely, a range of modules for transferable skills such as research integrity, research management, entrepreneurship, patents, etc. The student may also benefit from summer/winter schools and an overseas research visit to our collaborators in the US, Canada, UK and all-around Europe. The successful candidate will be supported to present their research findings at major international conferences, workshops, and seminars within the scope of their research projects.

Duties and Responsibilities

1. Undertake postgraduate research in the area of agreed research project.
2. Work closely with the academic supervisor to ensure that the progress of the individual project is in line with the objectives of Dr Dey's research programme.
3. Work effectively within a multidisciplinary environment that includes physicists and mathematicians.
4. Attend and participate in all training events and supervisory meetings.
5. Prepare PhD progress reports.
6. Present and publish research outputs to both academic and non-academic audiences.
7. Attend and participate in academic and non-academic conferences, events, and seminars.
8. Contribute to teaching/training of undergraduate and postgraduate project students working with Dr. Dey's group.

As the description of the duties and responsibilities cannot be exhaustive, it is worth mentioning that the PhD student may be required to undertake other duties that are broadly in line with the objectives of their research projects.

Qualifications, Expected Skills and Competencies

1. PhD applicants must hold at least a first-class honours Bachelor's or Master's degree in Electrical, Electronic Engineering, Computer Science, Physics, Wireless Communications, Mathematics, or a related discipline.
2. Excellent background in physics/mathematics/signal processing.
3. An aptitude for experimental work with electronics.
4. Strong mathematical, analytical, and programming skills.
5. Highly proficient English language skills.
6. Excellent written and verbal communication, including presentation skills.
7. Excellent organisational skills, attention to detail and the ability to meet deadlines.
8. Ability to think logically, create solutions and make informed decisions.
9. Willingness to work collaboratively in a research environment.
10. A strong commitment to their own continuous professional development.

Application Process / Additional Information

Applications must be sent by e-mail to Dr Indrakshi Dey (indrakshi.dey@mu.ie). Early applications are strongly encouraged.

Applications should include:

1. A cover letter explaining the applicant's motivation and interest in the project topic. Any relevant background and/or experience needs to be mentioned.
2. A Curriculum Vitae that includes the applicant's educational qualifications and any scientific publications and achievements.
3. Academic transcripts.
4. Two academic references.

Informal enquiries concerning the advertised position, accompanied with the CV and a motivation letter, can be made to Dr Indrakshi Dey (indrakshi.dey@mu.ie). Applications will close at 5pm (GMT) **Dec 24th 2021**. The received applications will be analysed after the application deadline, and the shortlisted candidates will be invited to a Skype interview.