

## Two Fully-Funded PhD Positions in High Mobility Wireless Communications Department of Electronic Engineering Maynooth University, Ireland

The Department of Electronic Engineering at Maynooth University is pleased to announce two PhD studentships with a start date of Autumn 2020 in the area of **High Mobility Wireless Communication Systems**.

<b>Open positions</b>	2 PhD Studentships in Wireless Communications
<b>Location</b>	Department of Electronic Engineering, Maynooth University
<b>Duration</b>	4 Years
<b>Funding / Stipend</b>	The PhD positions are both funded for 4 years, including a monthly stipend and a travel budget to present at international conferences, workshops and seminars. The studentships will cover four years of tuition fees and a stipend of € 18,500 per annum.
<b>Contact</b>	Dr Arman Farhang ( <a href="mailto:arman.farhang@mu.ie">arman.farhang@mu.ie</a> )
<b>Closing Date</b>	Friday 29 <sup>th</sup> May 2020

### General Research Theme of the PhD Projects

The emergence of a diverse set of services and applications in networks of the future set out many challenging requirements, including low latency and high reliability of the wireless links. These challenges are more pronounced in mission-critical applications such as autonomous vehicles that require safe and rapid reactions and cannot tolerate the wireless link becoming unreliable. This loss of reliability can be due to the fast variations of the wireless channel with time. To tackle such challenges, the goal of the PhD projects is to develop flexible, efficient and robust data transmission and detection techniques with reduced signaling overhead bolstered through utilization of advanced multiple antenna technologies. Dealing with time-varying channels has a long history; however, conventional solutions require fast tracking of such channels or large signaling overheads leading to huge latency issues. Hence, this research will fundamentally rethink the air interface and develop a new generation of modulation technologies that simultaneously utilize physical resources in multiple dimensions such as time, frequency and space. These projects will take a disruptive approach to achieve the maximum diversity gains that are inherent to wireless channel and improve link reliability while providing a low latency. This research will assess link reliability and latency aspects of the future vehicular networks, not only for the air interface, but also in the context of the optical link over which safety-critical as well as infotainment data will be transported to a core data centre and vice versa. Finally, these projects will attack the aforementioned challenges from a different angle through the design of novel frame structures and protocols applicable to the diverse ecosystems emerging in future networks, which is an open problem yet to be addressed.

## PhD Studentships

The PhD positions are both funded for 4 years, including a monthly stipend and a travel budget to present the research outputs at international conferences, workshops and seminars. The studentships will cover four years of tuition fees and a stipend of € 18,500 per annum. The successful candidates will be enrolled on the PhD programme in the Department of Electronic Engineering at Maynooth University. The successful candidates will write their theses on topics related to **Advanced Data Transmission and Detection Techniques for High Mobility Communication Systems**, supervised by Dr Arman Farhang for the entire duration of their PhD programme.

Each successful candidate will be an integral part of the overall research programme that Dr Farhang is leading around the topic of waveform design for next generation of wireless networks. The successful candidates will be prepared to work with Dr Farhang's network of collaborators who are among the leading scholars working on state of the art technologies in wireless and optical communications.

In addition to PhD supervision, the successful candidates, where relevant, will benefit from a wide range of training activities, namely,

- i. Summer/winter schools covering both technical, e.g. topics related to wireless communications within the scope of their PhD projects, and a range of transferable skills such as research integrity, research management, entrepreneurship, patents, etc.;
- ii. An overseas research visit;
- iii. Short-term industry internship.

Successful candidates 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 Farhang's research programme.
3. Attend and participate in all training events and supervisory meetings.
4. Prepare PhD progress reports.
5. Present and publish research outputs to both academic and non-academic audiences.
6. Attend and participate in academic and non-academic conferences, events and seminars.

As the description of the duties and responsibilities cannot be exhaustive, it is worth mentioning that the PhD students 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 or upper second class honours Bachelors or Master's degree in Electrical, Electronic Engineering or a related discipline.
2. Highly proficient English language skills. Evidence of English language proficiency for non-native speakers based on IELTS (or TOEFL internet/paper based) score of 6.5 (or score of 95/585) is essential to be available no later than 15<sup>th</sup> of August 2020.
3. Strong mathematical, analytical and programming skills.
4. Excellent background in communication theory and signal processing.
5. Excellent written and verbal communication, including presentation skills.

6. Excellent organisational skills, attention to details and the ability to meet deadlines.
7. Ability to think logically, create solutions and make informed decisions.
8. Willingness to work collaboratively in a research environment.
9. A strong commitment to their own continuous professional development.

### **Application Process / Additional Information**

Applications must be sent by e-mail to Dr Arman Farhang ([arman.farhang@mu.ie](mailto:arman.farhang@mu.ie)) in a single PDF file with the title "PhD\_Application\_{Applicant's surname}". **Early applications are strongly encouraged.**

Applications should include:

1. A cover letter explaining the applicant's motivation and interest to undertake a PhD 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 positions, accompanied with the CV, can be made to Dr Arman Farhang ([arman.farhang@mu.ie](mailto:arman.farhang@mu.ie)).

Applications will close on **Friday 29<sup>th</sup> of May 2020**. The received applications will be analysed after the application deadline, and the shortlisted candidates will be invited to a Skype interview.