



University College Dublin
Ireland's Global University

Fully-Funded PhD Position on Blockchain for Post-5G Communication Networks at the School of Computer science, University College Dublin (UCD), Ireland

We are seeking a highly motivated PhD student to join the School of Computer Science at University College Dublin (UCD) to study the use cases of blockchain technology in 5G and beyond communication systems.

Expected Start Date: January 2022

Post Summary

5G communication networks are being deployed worldwide, and the relevant technologies mature. What differentiated 5G from previous generations of mobile networks is not only the increased capacity and ultra-low latency but also a revolutionised network and business ecosystem with a distributed nature. This implies new business models for the research. Hence the next generation of the networks will be required to address many challenges facing the growth and development of such distributed communications ecosystems. The successful candidate will research the state-of-the-art in the area of blockchain technology's role in 5G and beyond networking and identify gaps/opportunities for future work. Subsequently, they will develop blockchain-based solutions using smart contracts and integrate them with open source SDN/SDR-based core/metro/access network controllers and orchestrators. In addition, optimising the performance of the potential solutions will be considered an integral part of the project.

Required Qualifications

The applicant must have:

- Strong background in computer/telecommunications networks;
- Working knowledge of at least one programming language such as python, JavaScript, Go and of Linux operating system;
- Good written and oral communication skills;
- The ability to work well in a group and;
- Strong self-motivation and willing to learn attitude.

Desirable Qualifications

In-depth knowledge in at least one of the following areas is essential:

- Experience with wireless/optical 5G concepts, e.g., Slicing, SDN, NFV, Open-RAN and relevant skills (OpenFlow, ONOS, P4, Virtualisation, and orchestrators)
- Experience with Blockchain and Smart Contracts, e.g., (Hyperledger Fabric, Ethereum).
- Practical experience with network emulation/simulation environments (e.g., MININET, NS3, MATLAB)
- Theoretical tools/methodologies with application in networks including Game Theory, Machine Learning, Optimization.

Entry Requirements

In addition to the requirements specific to the position, the minimum entry requirements for the PhD course at UCD are:

1. Higher Education

- a. 2.1 grade (i.e. with a score higher than 60% or equivalent) in an undergraduate or postgraduate degree (**preferably research masters**) in computer science, maths, engineering, or similar technical discipline.

2. English Language Proficiency

Non-native English speakers require at least:

- a. **TOEFL**: A minimum score of 90 is required in the Internet-based TOEFL (iBT) with no less than 21 in writing and at least 19 in every other section.
Or
- b. **IELTS**: An average score of 6.5 over all components and a minimum of 6.0 in each band on the Academic Version.
Or
- c. **equivalent** (further details on the equivalence of tests are available here).

The Offer

The successful applicant will benefit from:

- a full tuition fee waiver (EU nationals) and in return for teaching assistant duties (Non-EU nationals) plus an €18,000 annual stipend (€1,500 per month tax-free);
- support for international travel and conference attendance and;
- free access to [UCD Sport & Fitness](#) - Gym and Olympic Swimming Pool as a UCD student.

To Apply

Prepare a single PDF file consisting of:

1. Resume/Curriculum Vitae (CV), including:
 - a. Education History;
 - b. Programming/Computing skills (GitHub profile etc.) and;
 - c. Research projects/publications.
2. A cover letter (2-pages max) including a description of the applicant's research interests, reasons to apply for the position. The Cover letter must clearly indicate how the applicant's profile and skills fit the requirements of this PhD position.
3. Scanned copies of relevant academic transcripts and English language certificates.
4. A minimum of two recommendation letters and/or their contact information.

Shortlisted applicants will be contacted to arrange an **online** interview.

The application documents should be submitted **only** through the **application form** by the **deadline of September 20th, 2021**. Please direct any Informal enquiries regarding this role to Dr Nima Afraz (nima[dot]afraz[at]ucd.ie) and include "5G-Blockchain-1 PhD" in the subject line.

Equality, Diversity and Inclusion

UCD is committed to creating an inclusive environment where diversity is celebrated, and everyone is afforded equality of opportunity. To that end, the university adheres to a range of equality, diversity and inclusion policies. We encourage applicants to consult those policies here <https://www.ucd.ie/equality/>. We welcome applications from everyone, including those who identify with any of the protected characteristics that are set out in our Equality, Diversity and Inclusion policy.

Useful Links:

1. [Expectations Once Admitted: Stages of a UCD CS Structured PhD](#)
2. [PhD LIFECYCLE: The complete PhD journey at UCD](#)
3. [Study at UCD](#)