	Fully Funded PhD Position in Open Radio Access Networks **School of Electrical And Electronic Engineering**

University College Dublin (UCD) & School of Electrical and Electronic Engineering:

Ireland's largest university, University College Dublin, is ranked within the top 1% of higher education institutions worldwide. The university is located on a stunning 330-acre parkland campus in the vibrant south Dublin suburbs, home to three beautiful lakes. Dublin, the capital of Ireland, is renowned for its energetic atmosphere, rich cultural history, and bustling technology sector. The UCD School of Electrical & Electronic Engineering seeks to educate students in a research-intensive, industry-facing environment. The entire faculty brings an excellent mix of educational experience, international research, and innovation in industry. The School has an excellent international reputation for the quality of its research, and in its range of specialist areas, it has made a lasting impact on the Irish technology and energy sectors. The School has an international track record of research achievement across major fields of research, including circuits, communications, and signal processing, as well as biomedical engineering and electrical power. Its full-time academic staff includes four IEEE Fellows. The School is committed to the highest standards of undergraduate teaching, learning, and student development within a research-informed environment.

Position Description:

We are recruiting a highly motivated **PhD student** to work on cutting-edge research in **Distributed Learning Aspects of Open Radio Access Networks (ORAN)**, with a special focus on **Multi-objective Optimization** of such deployments, emphasizing **security cost, communication cost, and learning accuracy**. ORAN architecture has emerged as a transformative paradigm in the telecommunications industry, promising enhanced flexibility, interoperability, and cost-effectiveness. However, the realization of its full potential hinges on addressing various challenges, including the efficient management of network resources, optimization of performance, and mitigation of security threats. **Distributed Learning Automation (DLA)** offers a promising avenue for tackling these challenges by leveraging distributed intelligence and automation mechanisms to optimize ORAN operations dynamically. This research aims to answer the pragmatic deployment issues prompting in the fully autonomous networking infrastructure of ORAN, and to ensure the feasibility through systematic evaluation of its prime objectives.

Key areas of exploration include:

- Requirements for integrating **DLA** constructs in **ORAN** architecture.

- Defining **ORAN Cost Metrics** from a networking perspective for **DLA** integration.

- **Optimization** of **DLA** processes in **ORAN** through cost minimization.

- **Multi-objective optimization** approaches via **Generative AI** and **Evolutionary Algorithms**.

Candidate Profile:

Required Qualifications:

We are looking for candidates with:

- Strong background in computer/telecommunications networks with analytical skills;
- Working knowledge of at least one programming language, such as Python, JavaScript, or Go, and tools, such as MATLAB, Docker, Kubernetes, TensorFlow, or PyTorch;
- Experience in Machine Learning or AI development;
- Good written and oral communication skills;
- Ability to work well in a group, strong self-motivation, and willingness to learn.

Desired Qualifications:

In-depth knowledge in at least two 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).
- Network emulation/simulation environments (e.g., MININET, NS3, MATLAB).
- Hands-on work done with machine learning or federated learning simulations/emulations.
- Theoretical tools/methodologies with application in networks, including Game Theory, Machine Learning, and Optimization.

Entry Requirements:

In addition to the above requirements, the minimum entry requirements for a PhD at UCD are:

1) Higher Education: A solid academic background in Computer Science, Electrical/ Electronic/ Software Engineering, or related disciplines, with a minimum 2.1 honours degree. A Master's degree with research experience is highly desirable.

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.

b. IELTS: An average score of 6.5 over all components and a minimum of 6.0 in each band on the Academic Version.

Responsibilities:

The successful applicant will:

- Undertake a four-year research project within UCD's structured PhD programme.

- Contribute to academic publications and present research findings at international conferences.

- Engage with the broader academic community by participating in teaching activities and relevant UCD modules.

Funding:

This **full-time** PhD position is **fully funded** by the School of Electrical And Electronic Engineering, University College Dublin, offering:

- A stipend of up to €22,000 per annum, and student fees covered.

- Funding for up to **four** years.

Application Process:

To apply, please submit the following documents via the application form given here:

https://docs.google.com/forms/d/e/1FAIpQLSdf3r8JaEEv5aSyDBV-xu9AORFnmUQrIxBNBqb78uGjt2sJdA/viewform

1. Resume/Curriculum Vitae (CV), including:
   a. Education History with Results;
   b. Academic and Professional Experience;
   c. Programming/Computing skills (GitHub profile, etc.) and;
   d. Research projects/publications.
2. A cover letter (two pages max) including a description of the applicant's research interests and reasons for applying for the position. The Cover letter must clearly indicate how the applicant's profile and skills fit the requirements of this PhD position.
3. A research statement (two pages max) on the applicant's vision for the proposed research scope, with a brief description of the candidate's suitability for the proposed research.
4. Scanned copies of relevant academic transcripts and English language certificates.
5. A minimum of two recommendation letters and/or contact information from non-related referees.

Shortlisted applicants will be contacted to arrange an online interview.

The application documents should be submitted only through the application form by the deadline. Please direct any Informal inquiries regarding this role to **Dr. Pasika Ranaweera (pasika.ranaweera@ucd.ie)** and include "PhD-O-RAN-DLA" 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](#)

Application Deadline: **30th November 2024, 5 pm GMT.**

Start Date: The position is available to start **immediately** or as early as possible, with the start date of **April 2025 at the latest**.