Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

PhD Candidate in Distributed Machine Learning for Open RAN

Contract Type: Fixed Term

Contract Duration: 48 Months

Trinity College Dublin (TCD) is Ireland's leading university (ranked 75th globally by the QS World University Rankings 2026), renowned for excellence in research and teaching. The School of Computer Science and Statistics (SCSS) fosters a vibrant, international, and interdisciplinary research environment at the heart of Dublin city. This PhD position is hosted in SCSS under the supervision of Dr. Van Dinh Nguyen. The candidate will join a dynamic research team working on cutting-edge topics in next-generation mobile networks, distributed AI, and Open RAN architectures.

Project Context

Open Radio Access Networks (Open RAN) are transforming the design and deployment of mobile networks by enabling open interfaces, multi-vendor interoperability, and flexible cloud-native implementations. However, this openness introduces new challenges in terms of scalability, real-time decision-making, and network optimization.

This PhD project will explore distributed machine learning (DML) approaches to address these challenges. The research will focus on developing algorithms and frameworks that enable efficient, scalable, and secure distributed learning across RAN components while ensuring low latency and high reliability. Key directions include, but not limited to:

- Federated and split learning for RAN optimization.
- Resource allocation and scheduling using distributed reinforcement learning.
- Scalability and robustness of AI models in heterogeneous multi-vendor environments.
- Practical evaluation on open-source testbeds (e.g., O-RAN Alliance software stack, srsRAN).

Your Role

The successful candidate will:

- Conduct original research in distributed machine learning for Open RAN.
- Design, implement, and evaluate algorithms on both simulated and experimental testbeds.
- Collaborate with academic and industry partners in the telecommunications and AI domains.
- Disseminate research findings through high-impact journals and conferences.
- Contribute to open-source tools for reproducible research.

Your Profile

Qualification:

- BS/MSc (or equivalent) in Computer Science, Electrical/Electronic Engineering, or a related discipline.

Experience (desired but not all required):

- Strong background in machine learning, AI, and/or distributed systems.
- Knowledge of mobile communications (4G/5G/6G) and radio access networks.
- Familiarity with Open RAN concepts and cloud-native technologies (e.g., Kubernetes, Docker).
- Strong programming skills (Python, C/C++, TensorFlow/PyTorch).
- Experience with Linux-based systems and networking.
- Research publications or contributions to open-source projects are an advantage.

- Curiosity-driven, motivated, and eager to learn new technologies.

We Offer

- €25K stipend/year + EU fees x 4 Years
- A stimulating, international, and interdisciplinary research environment at SCSS, TCD.
- Access to state-of-the-art computing and experimental facilities.
- Opportunities to collaborate with leading industry partners and international researchers.
- Training in transferable skills, research methods, and academic publishing.

How to Apply

Candidates should submit a single PDF document, including:

- Full CV (with academic record, thesis titles, publications, relevant experience, and names and contact details of two referees).
- Cover letter (max 1 page) explaining motivation and research interests.
- Academic transcripts.
- English language certificate.

Applications and informal queries about the position can be submitted via **email to Dr. Van Dinh Nguyen** (dinh.nguyen @tcd.ie) with the email subject "**PhD-Spring26**" + "**your name**" For more details about the Supervisor's research, see the website https://www.tcd.ie/scss/people/academic-staff/nguyenva/ or https://icclabo.github.io/

Please note that I will carefully review all applications, but only shortlisted candidates will be contacted.