



Trinity College Dublin

Coláiste na Tríonóide, Baile Átha Cliath

The University of Dublin

Structured PhD Position in Computer Science (4-years full-time)

Project title: AI-Driven Energy Optimization in Next-Generation RANs

Project supervisor: Dr. Merim Dzaferagic (Trinity College Dublin).

Project locations: Discipline of Networks and Distributed Systems, School of Computer Science and Statistics, Trinity College Dublin.

Application deadline: 10th May 2025

Start date: 1st September 2025.

PhD structure: This is a full-time 4-year structured PhD project, based in the Discipline of Networks and Distributed Systems at Trinity College Dublin. The funding for the project includes a tax-free stipend. EU fees are provided for in the funding.

PhD topic: The disaggregation of Radio Access Networks (RANs) introduces new challenges in energy management. Unlike traditional architectures with static power allocation, disaggregated RANs allow for dynamic scaling and flexible placement of network functions, which significantly impacts power consumption. Initial research has shown that the placement of network functions, along with their scaling up and down, plays a critical role in overall energy efficiency. However, there is a significant gap in real-world experimentation and data collection, particularly in an end-to-end network deployment that integrates AI-driven energy optimization strategies.

Key challenges include collecting relevant energy consumption data, understanding its correlation with network performance, and developing AI-driven power management strategies that dynamically adapt to traffic demands. The project will involve hands-on experimentation with real networking equipment in the OpenIreland testbed, enabling the validation of AI-based techniques in a live disaggregated network environment. By evaluating the impact of function placement and scaling on power efficiency, the research will quantify trade-offs between energy savings and network performance under different AI-driven approaches.

The expected outcomes include a better understanding of how disaggregated network architectures influence power consumption, along with the development of AI-driven energy optimization techniques tailored for real-world deployments. By integrating experimental insights from OpenIreland, this project will bridge the gap between theoretical energy models and practical network operation, paving the way for more efficient and adaptable next-generation mobile networks.

The Institution: The School of Computer Science and Statistics at Trinity College Dublin is a friendly, and research-intensive centre for academic study and research excellence. The School has been ranked 1th in Ireland, top 25 in Europe, and top 100 Worldwide (QS Subject Rankings 2018, 2019, 2020, 2021, 2023).

Requirements: Applicants should have (or expect to obtain before the project starts) at least a 2.1 Honours degree or an equivalent qualification in electrical engineering, computer engineering, or computer science. They must demonstrate proficiency in communication networks, particularly wireless communications, and have some experience with machine learning and programming in C, C++, or Python. Hands-on experience with radio equipment (e.g., USRPs) is a plus. Applicants whose first language is not English will be required to demonstrate proficiency in English in accordance with Trinity College Dublin’s language requirements.

Funding notes: Stipend of €25,000 per year for four years. Fees for Home/EU students will be covered by the university.

Application: Applicants should email Dr. Merim Dzaferagic (merim.dzaferagic@tcd.ie) to apply. The application should include a 2-page comprehensive CV, academic transcripts of the degree/degrees, and a short cover letter/statement of purpose (2-pages max) indicating how their skills align with the project and their motivation for applying. Please include “PhD Application (AI-Driven Energy Optimization in Next-Generation RANs)” followed by your name in the subject line. The application CV should, at minimum, include the applicant’s name, educational institution, qualification stating overall grade/percentage (predicted grades are acceptable for those still studying) and contact details of two academic referees. Informal queries can be made to: merim.dzaferagic@tcd.ie. Please include “PhD Query (AI-Driven Energy Optimization in Next-Generation RANs)” followed by your name in the subject line.