

Sumaiya Binte Ali

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 Dublin, Ireland

PhD candidate in Electrical and Computer Engineering at Trinity College Dublin with a research focus on dynamic reconfigurability of metro-scale optical networks. Experienced in characterising optical system components, including transceivers, amplifiers, and switching elements in multi-vendor and multi-domain environments. Skilled in SDN-based orchestration, testbed automation, and development of control frameworks for disaggregated optical transport.

Technical Skills

- **Optical Networking & Transport:** Wavelength Division Multiplexing (WDM), Optical Amplifiers (EDFA), ROADM-based Systems, Optical Power Dynamics, Quality of Transmission (QoT), Metro / DCI topologies, Disaggregated network design, Real-Time optical reconfiguration.
- **Experimental Infrastructure & Automation:** Testbed Development, Automated Measurement Pipelines, Control Frameworks, Optical Link Testing, Bit Error Rate Testing (BERT), Optical Spectrum analysers (OSA), OTDR.
- **Programmable Networks & SDN:** Ryu Controller, FreeRTR, P4 Data Plane Programming, CLICK Modular Router, Containerized Network Functions, Federated Testbed Integration.
- **Software & Tools:** MATLAB, Python, Bash, AutoCAD, LaTeX, COMSOL Multiphysics, Optiwave, OptiSystem.
- **Languages:** English (Professional), Bangla (Native).

Work Experience

PhD Student

Trinity College Dublin,

CONNECT Centre for Future Networks and Communications

Supervisor: Prof. Dan Kilper

Mar 2022 – Present

Dublin, Ireland

- Contributed to research across academic and industry projects (**ECO-eNET**, **NTT**, **COSMOS**) involving testbed development, network configuration, and automation. Worked on system setup, coordinated with partners, and conducted experiments to study optical network behaviour in multi-domain and metro/DCI environments.
- **Ongoing Work:**
 - Conducting automated experiments on metro-scale ROADM systems to analyse power dynamics during wavelength reconfiguration, particularly amplifier behaviour, channel loading, and switching strategies.
 - Performing live-network transceiver characterisation in the EC-funded **ECO-eNET** project, evaluating signal quality, interoperability, and link performance.
 - Preparing a technical survey on orchestration and reconfigurability in multi-domain optical systems with focus on interfaces, distributed coordination, and architecture trends.
- **NTT Collaboration:** Assisted in deploying and troubleshooting the Trinity optical domain in multi-partner field trials. Configured topology, resolved connectivity issues, and supported SDN orchestration over HEAnet production network.
- **COSMOS Collaboration:** Set up and managed the TCD testbed in the COSM-IC global 5G/cloud federation. Enabled container migration, service integration, and latency troubleshooting across Open Ireland–COSMOS infrastructure.
- **ECO-eNET Project:** Designed and executed automated metro ROADM experiments to study power excursions and spectral-hole burning during band-based switching. Built workflows, control systems, and analysed trends.

Teaching Assistant
Trinity College Dublin

2022 – Present
Dublin, Ireland

- Supported teaching and assessment in Electrical and Electronic Engineering courses:
 - *Digital Circuits (EEU33C02)* – Instructed students in CMOS logic design, transistor-level analysis, and simulation labs.
 - *Engineering Design IV (EEU22E10)* – Supervised Arduino-based vehicle projects involving circuit design and control programming.
 - *Introduction to Professional Engineering (MEU11E08)* – Guided student team through design projects, ethical casework, report writing and presentation.
- Advised on circuit debugging, simulation tools, and programming practices.
- Provided feedback aligned with learning outcomes and department criteria.

Standard Invigilator
Trinity College Dublin – Exams Office

2023 – Present
Dublin, Ireland

- Administered university examinations across multiple venues in accordance with institutional policies.
- Provided accommodations for students registered with the Disability Service.

Education

Ph.D. Electrical & Computer Engineering
Trinity College Dublin

2022 – Present

Thesis: *Dynamic Reconfigurability of Metro Optical Networks*

Supervisor: Prof. Dan Kilper

B.Sc. EEE
Leading University, Sylhet

2016 – 2020

Thesis: *Design and Performance analysis of a low loss Photonic Crystal Fiber in THz regime*

Supervisor: MD. Ashraful Islam

Publications

- K. Anazawa, et al., "Experimental Evaluation of an SDN Controller for Open Optical-Circuit-Switched Networks," *arXiv:2501.16907*, 2025.
- S. Ali, et al., "Hole-Burning Mediated Dynamics for Channel Band Reconfiguration," *IEEE FNWF*, 2024.
- S. Choudhury, et al., "Remote Orchestration of NextG Services," *IEEE Globecom Workshops*, 2023.
- R. Dash, et al., "Photonic Crystal Fiber in THz Regime," *IEEE TENSYP*, 2020.