




Muhammad Shayan Nazeer


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Research Interests: Network and System Design, Cloud Computing, 5G Mobile Networks, and 3GPP Standards.

Education

University of Massachusetts, Amherst, United States (Expected Fall '27)
Ph.D. in Computer Engineering Sept 2023 – Present

Designing AI-Native cellular core network, where AI is not an afterthought, rather part of the network fabric.

Advisor: Dr. Taqi Raza 

National University of Sciences and Technology (NUST), Pakistan Sept 2019 – July 2023
Bachelor's of Electrical Engineering (Gold Medal)

Focus: Wireless Networks, Embedded System, and Hardware Security

Experience

Nokia Bell Labs Murray Hill, NJ, USA
Network System Co-Op Feb 2025 - June 2025

- Implemented *Lower Layer Triggered Mobility (LTM)* handover in a proprietary cellular system, modifying control-plane signaling paths to reduce handover latency.
- Designed and prototyped a *reinforcement learning-based, RACH-less handover mechanism*, eliminating target-cell signaling and reducing control-plane overhead during mobility events. (Patented)

University of Massachusetts Amherst Amherst, MA, USA
Graduate Research Assistant Sept 2023 – Present

- Analyzed and cross-validated 3GPP spec to identify architectural and protocol-level inefficiencies in 5G Core control-plane design, including tight state coupling, over-centralized network functions, and limited cloud-native scalability assumptions.
- Designed and implemented a cloud-native 5G Core reference architecture, explicitly separating control-plane logic from persistent state using distributed data stores and stateless service interfaces.
- Introduced data-partitioned state management and fine-grained functional decomposition, reducing inter-service coupling and improving control-plane scalability under concurrent session load.

NUST NeuroInformatics Research Lab Islamabad, Pakistan
Machine Learning Engineer Sept 2022 - Aug 2023

- Optimized a non-invasive EEG-based brain-computer interface using deep learning to decode user motor intentions for real-time assistive robot motion control.
- Integrated the EEG classification pipeline with the robotic control system to execute multi-directional movements, experimentally validating reliable brain-driven control of an assistive robotic platform.

RADWI Technologies Islamabad, Pakistan
Embedded Software Engineer Intern Apr 2021 – Oct 2021

- Designed and developed an IoT-enabled electronic door lock, integrating real-time connectivity with AWS IoT Core.
- Prototyped a Zigbee mesh network for enhanced connectivity of smart home automation devices.
- Led the development of a framework to integrate smart home devices with cloud and mobile applications.

Teaching Experience

Teaching Assistant: ECE 371 Security Engineering

Fall'24 & Fall'25

Instructor: SENGI: Fundamentals of Wireless Networks

Summer'24 & Summer'25

Technical Skills

Networks: Network Systems Design, Cloud Native 5G, Cellular Core Architecture, USRPs

5G / Cellular Tools: Openairinterface, Open5GS, Free5GC, UERANSIM, PacketRusher, POWDER Platform

Programming Languages: C++, C, Python, JavaScript


Engineering Tools: MATLAB, Quartus, Mbed Studio

Honors and Awards

2024 - **Colosseum Young Gladiator**, NSF funded master class on Colosseum 5G testbed at [NEU](#) 

2023 - **Rectors Gold Medal**, Received for best undergraduate senior design project.

2023 - **NUST High Achiever's Award**, Gold Medal for outstanding academic performance.

2022 - **CSAW Logic Locking Conquest**, Global Runner Up (Organized by [NYU](#) ).

2018 - **National Physics Talent Conquest**, Selected among top 50 students in Pakistan for [IPhO](#)  training.

2017 - **INTEL ISEF**, Finalist at national level.

Publications

MA Soomoo*, **Muhammad Shayan Nazeer***, C Delsignore, Y Chandio, MT Raza, FM Anwar, "*SynchroNB: Toward Robust Timing for 5G NB-IoT Networks*", ACM SenSys 2026.

Muhammad Shayan Nazeer, MT Raza, "*ORACLE: Reconciling Next-G Cellular Core Operations for Correctness*", IEEE ICC 2026 (Under Review)

SE Fatima, SA Rahman, W Mumtaz, **Muhammad Shayan Nazeer**, "*Non-Invasive EEG-Driven Brain-Computer Interface for Motion Control of Assistive Robotics*", IEEE IC2AI 2025

Patents

Muhammad Shayan Nazeer, A Kak, N Choi, "*Method For Early Synchronization Through Source Cell For RACH-LESS LTM*", Accepted and Under filing by Nokia Bell labs.