



Muhammad Toaha Raza Khan

Education

- 2017-2022 **Ph.D (combined MS.) in Computer Science and Engineering** *CGPA 3.86/4.3, Kyungpook National University, Daegu, South Korea.*
- 2012-2016 **B.S. Electrical Engineering (Telecommunication)** *CGPA 3.89/4, COMSATS Institute of Information Technology, Islamabad, Pakistan.*

Work Experience

- 2024 till date **Assistant Professor, MIDDLE EAST TECHNICAL UNIVERSITY NORTHERN CYPRUS CAMPUS (METU-NCC).**
Working since September 2024, till date, at Department of Computer Engineering, Güzelyurt, Northern Cyprus.
- **Research Focus:** 5G/6G IoT Communications, Flying Ad Hoc Networks (FANETs), and Vehicular Networks (V2X).
 - **Undergraduate Teaching:**
 - CNG 100 (Intro. to Information Tech. and Applications), CNG 111 (Intro. to Computer Eng. Concepts)
 - CNG 140 / CNG 230 (C Programming / Intro. to C Programming), CNG 223 / INE 223 (Discrete Computational Structures)
 - CNG 232 / EEE 248 (Logic Design), CNG 300 / CNG 400 (Summer Practice I & II)
 - CNG 331 / EEE 445 (Computer Organization / Architecture I), CNG 476 (System Simulation)
 - CNG 491 / CNG 492 (Computer Eng. Design I & II), ESC 491 / ESC 492 (Multidisciplinary Eng. System Design & Implementation)
 - **Graduate Teaching:** CNG 500 (M.Sc. Thesis), CNG 807 (Special Studies).
 - **Capstone Advising:** Advisor for “*Activizer: AI-Guided Laser Camera Footstep Training*” and “*AI-Powered Fitness Coach*”; Co-Advisor for “*Activity Detection Health Monitoring System*” and “*AI-Powered Solar Energy Optimization*”.
 - **Grants Supervised:** Principal Supervisor for two accepted AdimODTÜ Undergraduate Research Projects (ADIMODTÜ-2026/9 and ADIMODTÜ-2026/8).
- 2023-2024 **Postdoctoral Research Fellow, MIDDLE EAST TECHNICAL UNIVERSITY NORTHERN CYPRUS CAMPUS (METU-NCC).**
Worked from February 2023 to August 2024 at Department of Computer Engineering.
- **Research Focus:** Human Activity Recognition (HAR) using ambient binary sensor networks.
 - **Courses Taught:** CNG 100 (Intro. to IT & Apps), CNG 140 (C Programming), CNG 331 / EEE 445 (Computer Organization / Architecture I).
 - **Supervision:** Co-advised capstone project “*Multi-Sensor Activity Detection Based Health Monitoring System*”.
- 2017-2022 **Graduate Research Engineer, WIRELESS AND MOBILE INTERNET LABORATORY (MoNET),** Daegu, Korea.
Kyungpook National University (March 2017 - August 2022).
- Conducted research on cross-layer wireless protocols, IoUT, and vehicular ad-hoc communication networks.
 - Formulated optimization algorithms and verified performance using mathematical and statistical modelling.
 - Documented research outcomes into SCI/SCIE indexed journal articles and flagship IEEE/ACM conferences.

Patents

US Patent:

- **Muhammad Toaha Raza Khan, Nadia Nawaz Qadri and Hassan Iftikhar,** “A Square shaped multi slotted 2.45 GHz wearable antenna,” U.S. Patent Application 15/626,536.

Korean Patents:

- **Muhammad Toaha Raza Khan**, Syed Hassan Ahmed, Muhammad Azfar Yaqub, Hyeongcheol Park and Dongkyun Kim, “A dynamic duty-cycle control method for a next-wake-up time of a transmitter node in an underwater wireless sensor network,” Korean Patent Application 10-2018-0058514.
- **Muhammad Toaha Raza Khan**, Syed Hassan Ahmed, Muhammad Azfar Yaqub, Hyeongcheol Park and Dongkyun Kim, “The present invention relates to a method for adjusting a dynamic duty cycle based on a receiver based on residual energy in an underwater wireless sensor network,” Korean Patent Application 10-2017-0158808.

Publications

Journals & Magazines

- T. Zafar, **Muhammad Toaha Raza Khan**, M. Fahrioglu, E. Ever, “AI-Driven Smart Home Appliance Optimization: A Systematic Review,” *Applied Energy*, 2026.
- **Muhammad Toaha Raza Khan**, “VISTA-LoRa: Task-Oriented Semantic Visual Transmission for Ultra-Low-Bitrate LoRa,” *IEEE Wireless Communications Letters*, 2026.
- **Muhammad Toaha Raza Khan**, E. Ever, O. Chughtai, Y.K. Ever, “Bridging the Trust-Latency Gap in 6G NTN V2X: An Edge-Native Architecture and Standardisation Perspective,” *IEEE Communications Standards Magazine*, 2026.
- H.A. Ali, E. Ever, B. Kizilkaya, **Muhammad Toaha Raza Khan**, M.U. Rehman, S. Ansari, M.A. Imran, “An Edge-Intelligent Three-Tier Framework for Real-Time Forest Fire Detection, Integrating WSNs, WMSNs, and UAVs,” *Internet of Things*, Article 101861, 2025.
- **Muhammad Toaha Raza Khan**, E. Ever, S. Eraslan, Y. Yesilada, “Human Activity Recognition Using Binary Sensors: A Systematic Review,” *Information Fusion*, vol. 115, Article 102731, 2025.
- **Muhammad Toaha Raza Khan**, Y.Z. Jembre, M.M. Saad, S.H. Bouk, S.H. Ahmed, D. Kim, “Proactive Content Retrieval Based on Value of Popularity in Content-Centric Internet of Vehicles,” *IEEE Transactions on Intelligent Transportation Systems*, vol. 25, no. 8, pp. 8514-8526, 2024.
- M.M. Saad, M.A. Tariq, **Muhammad Toaha Raza Khan**, D. Kim, “Non-Terrestrial Networks: An Overview of 3GPP Release 17 & 18,” *IEEE Internet of Things Magazine*, vol. 7, no. 1, pp. 20-26, 2024.
- M.A. Tariq, M.M. Saad, **Muhammad Toaha Raza Khan**, J. Seo, D. Kim, “DRL-Based Resource Management in Network Slicing for Vehicular Applications,” *ICT Express*, vol. 9, no. 6, pp. 1116-1121, 2023.
- M.A. Tariq, **Muhammad Toaha Raza Khan**, M.M. Saad, M.M. Islam, D. Kim, “AI-Enabled Reliable Delay-Sensitive Communication Mechanism in IoUT Using CoAP,” *IEEE Sensors Journal*, vol. 23, no. 16, pp. 18832-18841, 2023.
- A.P. Mdee, **Muhammad Toaha Raza Khan**, J. Seo, D. Kim, “Security-Compliant and Cooperative Pseudonyms Swapping for Location Privacy Preservation in VANETs,” *IEEE Transactions on Vehicular Technology*, vol. 72, no. 8, pp. 10710-10723, 2023.
- M.M. Saad, **Muhammad Toaha Raza Khan**, G. Srivastava, R.H. Jhaveri, M. Islam, D. Kim, “Cooperative Vehicular Networks: An Optimal and Machine Learning Approach,” *Computers and Electrical Engineering*, vol. 103, Article 108348, 2022.
- A.P. Mdee, M.M. Saad, M. Khan, **Muhammad Toaha Raza Khan**, D. Kim, “Impacts of Location-Privacy Preserving Schemes on Vehicular Applications,” *Vehicular Communications*, vol. 36, Article 100499, 2022.
- M.M. Islam, **Muhammad Toaha Raza Khan**, M.M. Saad, M.A. Tariq, D. Kim, “Dynamic Positioning of UAVs to Improve Network Coverage in VANETs,” *Vehicular Communications*, vol. 36, Article 100498, 2022.
- **Muhammad Toaha Raza Khan**, M.M. Saad, M.A. Tariq, J. Akram, D. Kim, “SPICE-IT: Smart COVID-19 Pandemic Controlled Eradication over NDN-IoT,” *Information Fusion*, vol. 74, pp. 50-64, 2021.

- A. Siddiqua, M. Diyan, **Muhammad Toaha Raza Khan**, M.M. Saad, D. Kim, “Mitigating Broadcasting Storm Using Multihead Nomination Clustering in Vehicular Content-Centric Networks,” *Electronics*, vol. 10, no. 18, Article 2270, 2021.
- Y.Z. Jembre, Y.W. Nugroho, **Muhammad Toaha Raza Khan**, M. Attique, R. Paul, S.H.A. Shah, B. Kim, “Evaluation of Reinforcement and Deep Learning Algorithms in Controlling Unmanned Aerial Vehicles,” *Applied Sciences*, vol. 11, no. 16, Article 7240, 2021.
- M.M. Saad, **Muhammad Toaha Raza Khan**, S.H.A. Shah, D. Kim, “Advancements in Vehicular Communication Technologies: C-V2X and NR-V2X Comparison,” *IEEE Communications Magazine*, vol. 59, no. 8, pp. 107-113, 2021.
- **Muhammad Toaha Raza Khan**, M. Muhammad Saad, Y. Ru, J. Seo, D. Kim, “Aspects of Unmanned Aerial Vehicles Path Planning: Overview and Applications,” *International Journal of Communication Systems*, vol. 34, no. 10, e4827, 2021.
- M.M. Islam, **Muhammad Toaha Raza Khan**, M.M. Saad, D. Kim, “Software-Defined Vehicular Network (SDVN): A Survey on Architecture and Routing,” *Journal of Systems Architecture*, vol. 114, Article 101961, 2021.
- M.A. Tariq, M. Khan, **Muhammad Toaha Raza Khan**, D. Kim, “Enhancements and Challenges in CoAP–A Survey,” *Sensors*, vol. 20, no. 21, Article 6391, 2020.
- U. Javaid, F. Jameel, U. Javaid, **Muhammad Toaha Raza Khan**, R. Jantti, “Rogue Device Mitigation in the Internet of Things: A Blockchain-Based Access Control Approach,” *Mobile Information Systems*, Article 8831976, 2020.
- S. Lee, Y. Bae, **Muhammad Toaha Raza Khan**, J. Seo, D. Kim, “Avoiding Spurious Retransmission over Flooding-Based Routing Protocol for Underwater Sensor Networks,” *Wireless Communications and Mobile Computing*, Article 8839541, 2020.
- E. Moon, **Muhammad Toaha Raza Khan**, H. Park, S.H. Ahmed, S. Lee, D. Kim, “OMRI-MAC: Optimized Multi-Transmission Receiver-Initiated MAC in Underwater Wireless Sensor Networks,” *Wireless Personal Communications*, vol. 107, no. 3, pp. 1491-1505, 2019.
- **Muhammad Toaha Raza Khan**, Y.Z. Jembre, S.H. Ahmed, D. Kim, “REMEDY: Receiver-Initiated MAC Based on Energy-Efficient Duty-Cycling in the IoUT,” *IEEE Access*, vol. 7, pp. 105202-105211, 2019.
- **Muhammad Toaha Raza Khan**, S.H. Ahmed, D. Kim, “AUV-Aided Energy-Efficient Clustering in the Internet of Underwater Things,” *IEEE Transactions on Green Communications and Networking*, vol. 3, no. 4, pp. 1132-1141, 2019.
- **Muhammad Toaha Raza Khan**, S.H. Ahmed, Y.Z. Jembre, D. Kim, “An Energy-Efficient Data Collection Protocol with AUV Path Planning in the Internet of Underwater Things,” *Journal of Network and Computer Applications*, vol. 135, pp. 20-31, 2019.
- F.A. Orakzai, A. Ahmad, **Muhammad Toaha Raza Khan**, M. Iqbal, “Optimal Energy-Efficient Resource Allocation in Uplink SC-FDMA Networks,” *Transactions on Emerging Telecommunications Technologies*, vol. 28, no. 8, e3153, 2017.
- A. Ahmad, **Muhammad Toaha Raza Khan**, Z. Kaleem, “Uplink Optimal Power Allocation for Heterogeneous Multiuser SIMO SC-FDMA Networks,” *Electronics Letters*, vol. 52, no. 24, pp. 1990-1992, 2017.

Conferences & Workshops

- A.P. Mdee, **Muhammad Toaha Raza Khan**, J. Seo, D. Kim, “Infrastructure-Independent Pseudonym Swap Protocol for Vehicular Networks,” *ICUFN*, 2022.
- M.M. Islam, M.M. Saad, **Muhammad Toaha Raza Khan**, S.H.A. Shah, “Proactive UAVs Placement in VANETs,” *IEEE ICC*, 2022.
- M.M. Saad, M.A. Tariq, M.M. Islam, **Muhammad Toaha Raza Khan**, J. Seo, D. Kim, “Enhanced Semi-Persistent Scheduling (e-SPS) for Aperiodic Traffic in NR-V2X,” *ICAHC*, 2022.
- A. Siddiqua, **Muhammad Toaha Raza Khan**, M.M. Islam, M.A. Tariq, M.M. Saad, D. Kim, “A Comparative Analysis on Machine Learning-Based Intelligent Forwarding Schemes in VNDN,” *KICS*, 2022.

- M.M. Saad, M.M. Islam, M.A. Tariq, **Muhammad Toaha Raza Khan**, D. Kim, “Collaborative Multi-Agent Resource Allocation in C-V2X Mode-4,” *ICUFN*, 2021.
- M.M. Islam, M.M. Saad, R. Yang, **Muhammad Toaha Raza Khan**, J. Seo, D. Kim, “Reinforcement Learning-Based UAV Trajectory Control to Assist VANETs,” *KICS*, 2021.
- **Muhammad Toaha Raza Khan**, M.M. Saad, J. Seo, S.H. Ahmed, D. Kim, “Reliable Interest Forwarding Strategy for Underwater Vehicular NDN,” *ACM SAC*, 2021.
- M. Khan, **Muhammad Toaha Raza Khan**, M.M. Saad, D. Kim, “A User Profile-Based Smart Home Energy Management System,” 2020.
- M.M. Saad, **Muhammad Toaha Raza Khan**, M.A. Tariq, D. Kim, “LSTM-Enabled Artificial Intelligent Smart Gardening System,” 2020.
- W.U. Khan, J. Liu, F. Jameel, **Muhammad Toaha Raza Khan**, S.H. Ahmed, R. Jantti, “Secure Backscatter Communications in Multi-Cell NOMA Networks,” *IEEE INFOCOM Workshops*, 2020.
- M. Khan, **Muhammad Toaha Raza Khan**, D. Kim, “Mitigating Interference and Energy Issues in Smart Homes Using IoT,” *IEEE WCNC Workshops*, 2020.
- J. Seo, S. Lee, **Muhammad Toaha Raza Khan**, D. Kim, “A New CoAP Congestion Control Scheme Considering Strong and Weak RTT for IoUT,” *ACM SAC*, 2020.
- **Muhammad Toaha Raza Khan**, Y.Z. Jembre, S.H. Ahmed, J. Seo, D. Kim, “Data Freshness-Based AUV Path Planning for UWSN,” *IEEE GLOBECOM*, 2019.
- J. Seo, S. Lee, **Muhammad Toaha Raza Khan**, D. Kim, “Adaptive Selection of Configuration Methods in 6LoWPAN-Based IoUT,” *RACS*, 2019.
- N. Leshov, M.A. Yaqub, **Muhammad Toaha Raza Khan**, S. Lee, D. Kim, “Content Name Privacy in Tactical Named Data Networking,” *ICUFN*, 2019.
- M. Kim, S. Lee, **Muhammad Toaha Raza Khan**, J. Seo, Y. Bae, Y. Jeong, D. Kim, “A New CoAP Congestion Control Scheme Using Message Loss Feedback for IoUT,” *ACM SAC*, 2019.
- **Muhammad Toaha Raza Khan**, S.H. Ahmed, D. Kim, “AUV-Assisted Energy-Efficient Clustering in Underwater Wireless Sensor Networks,” *IEEE GLOBECOM*, 2018.
- L. Amwine, **Muhammad Toaha Raza Khan**, M.A. Yaqub, S.H. Ahmed, D. Kim, “RIED-MAC: Receiver-Initiated MAC Based on Energy-Efficient Duty Cycling for UWSNs,” *OCEANS-MTS/IEEE*, 2018.
- M.A. Yaqub, **Muhammad Toaha Raza Khan**, S.H. Ahmed, D. Kim, “Receiver-Initiated Dynamic Duty Cycle Scheduling Schemes for Underwater Wireless Sensor Networks,” *IEEE CCNC*, 2018.
- M.A. Tariq, M.M. Saad, M. Islam, **Muhammad Toaha Raza Khan**, J. Seo, D. Kim, “Reinforcement Learning-Based Resource Scheduling for Network Slicing in Vehicular Networks,” 2016.
- **Muhammad Toaha Raza Khan**, M.S. Malik, M.A. Tariq, M.M. Islam, J. Seo, R. Yang, D. Kim, “Reinforcement Learning-Based Scheduling in Underwater NDN,” 2016.

Research Projects

- 2026 AdmODTÜ Undergraduate Research Project (ADIMODTÜ- 2026/9), Role: Project Supervisor (Worth 70,000 TL).
- 2026 AdmODTÜ Undergraduate Research Project (ADIMODTÜ- 2026/8), Role: Project Supervisor (Worth 50,000 TL).
- 2024 International Science Partnerships Fund (ISPF) 935: Engineering & Physical Sciences – Enhancing Post-Earthquake Communication Resilience, the Integration of UAVs, LoRa Technology, and GDPR-Compliant Systems (Worth 80,000 £).
- 2023–2024 AI Resource Allocation in Mobile-Based V2X Communications granted by Québec Merit Scholarship for Foreign Students (PBEEE) 2023–2024 (Worth \$35,000).
- 2017–2022 Basic Science Research Program through the National Research Foundation of Korea (NRF) (Worth \$400,000).

- 2017–2021 BK21 Plus project: SW Human Resource Development Program for Supporting Smart Life (Worth \$100,000).
- 2020–2022 BK21 FOUR Graduate Innovation Project: International Joint Research Project for Graduate Students (Worth \$80,000).

Accepted Project Proposals

- 2026 Project Title: AdımODTÜ Undergraduate Research Project (ADIMODTÜ- 2026/9) granted by AdımODTÜ. Role: Project Supervisor. (Worth 70,000 TL)
- 2026 Project Title: AdımODTÜ Undergraduate Research Project (ADIMODTÜ- 2026/8) granted by AdımODTÜ. Role: Project Supervisor. (Worth 50,000 TL)
- 2023 Project Title: AI Resource Allocation in Mobile-Based V2X Communications granted by Québec Merit Scholarship for Foreign Students (PBEEE) 2023–2024. (Worth \$35,000)
- 2022 Project Title: AI-enabled CF-based V2X communication granted by the National Research Foundation of Korea (NRF). (Worth \$450,000)

Book

- 2021 **Muhammad Toaha Raza Khan** and Dongkyun Kim, “**Network Programming**, Basics and Practice”, HuStar ICT, ISBN 979-11-966957-4-3.

Awards

- 2021 Awarded **BK21 FOUR Graduate Innovation Project Best Research Paper Award** by Kyungpook National University, Korea.
- 2019 Awarded **Computer Science and Engineering (CSE) Best Research Paper Award** by School of Computer Science and Engineering, Kyungpook National University, Korea.
- 2019 Awarded **ACM SIGAPP Student Travel Award** to attend SAC 2019, Limassol, Cyprus.
- 2017–2020 Awarded **KNU International Graduate Scholarship (KINGS)** for Masters combined Ph.D studies in Kyungpook National University, Korea.
- 2016 Awarded **Institute Gold Medal & Campus Gold Medal** in B.S. Electrical Engineering in COMSATS Institute of Information Technology, Pakistan.
- 2015 Won **1st position** in **Final Year Project Competition** at “13th International Conference on Frontiers of Information Technology (FIT’15)” held at Serena Hotel, Islamabad, Pakistan.
- 2012–2016 Awarded **Prime Minister’s National ICT R&D Merit Scholarship** for 4-years B.S. Engineering in COMSATS Institute of Information Technology, Pakistan.

Certifications

- 2026 **IBM Financial Planning and Analysis (FP&A) with AI Skills Professional Certificate**, IBM, *Online*.
- 2026 **Understanding Research Methods**, by *University of London & SOAS University of London*, *Online*.
- 2025 **Generative AI: Prompt Engineering Fundamentals**, by IBM, *Online*.
- 2023 **Business Analytics: Decision Making Using Data**, *University of Cambridge Judge Business School Executive Education*, *Online*.
- 2022 **Python for Machine Learning & Data Science Masterclass**, *Udemy*, *Online*.
- 2022 **The Project Management Course: Beginner to Project Manager**, *Udemy*, *Online*.

Professional Service & Editorial Activities

- Since 2026 **Associate Editor**, *Wireless Personal Communications*, Springer.
- 2019–2024 Organizing and Serving as Workshop Co-chair of International Workshop on Intelligent Communication Network Technology (ICNET) for the past 6 seasons.

- Since 2017 Actively participated as technical committee member in multiple tracks and symposiums in IEEE ICC, IEEE Globecom, IEEE VTC, IEEE CCNC, ACM MobiHoc, ACM RACS, ACM SAC conferences.
- 2018 Served as web chair in 8th ACM MobiHoc Workshop on Pervasive Wireless Healthcare (MobileHealth 2018) co-located with The 19th ACM MobileHoc 2018, June 26–29, Los Angeles, USA.
- 2017–2022 Performed Duties as Teaching Assistant (TA) for different courses including Network Programming, Advanced Computer Networks, Internet of Things.
- 2017–2022 Worked as Graduate Research Engineer in Wireless and Mobile Networking Laboratory (MONET-Lab), Kyungpook National University, Korea.
- 2016–2017 Co-supervising semester projects of Electrical Engineering students.

Volunteer Work

- Since 2018 Member of ACM Special Interest Group on Applied Computing (ACM SIGAPP).
- Since 2018 Member of IEEE Communications Society (COMSOC).
- Since 2017 Member of IEEE Young Professionals.
- Since 2017 Member of IEEE Graduate Student Member, Seoul Section, R10-Asia and Pacific.
- 2015–2016 Elected Treasurer of IEEE COMSATS Wah Cantt Student Branch, R10-Asia and Pacific.
- 2015–2016 Member of IEEE Student Member, COMSATS Wah Cantt Student Branch, R10-Asia and Pacific.

References

- 1 **Safdar Hussain Bouk (Ph.D)**
Assistant Professor,
Old Dominion University, VA, USA.
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