Md Nadim

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Research Interests

Rural Broadband, Next Generation Wireless Networks, Wireless X-haul communications (Microwave and Millimeter Wave), Free Space Optical Communication (FSOC), Predictable Wireless Networking and Routing, Distributed Systems, Testbeds, and Real-world Network measurement.

Education

Iowa State University *June 2022 – Present*
Ph.D. in Computer Engineering *GPA: 3.88/4.0*
Advisor: Dr. Hongwei Zhang

Iowa State University *Aug 2022 – Aug 2025*
M.Sc. in Computer Engineering *GPA: 3.89/4.0*
Advisor: Dr. Hongwei Zhang

Bangladesh University of Engineering and Technology (BUET) *Feb 2013 – Sep 2017*
B.Sc. in Electrical and Electronic Engineering

Experience

Graduate Research Assistant *Ames, IA*
Center for Wireless, Communities and Innovation (WiCI) *June 2022 – Present*

- Core team member within the Research, Development, and Operations unit and a Lead of the Wireless X-haul Subgroup of the ARA Wireless Living Lab, an NSF-funded PAWR (Platforms for Advanced Wireless Research) project.

Specialist *Dhaka, Bangladesh*
Robi Axiata Limited *July 2019 – June 2022*

- Contributed to the Wireless Transport Planning team within the Technology Planning Department, focusing on network design and capacity optimization.
- Led the Transmission First-Line Support in the Service Operation Center under the Technology Operations Department, providing front-line support for transmission network issues.

Network Designer (Remote) *Ontario, Canada*
SM Consulting Services Inc. *Dec 2021– June 2022*

- Project leader and IP and Network Planner for two entire provinces.

Jr. System Engineer *Dhaka, Bangladesh*
Bangla Phone Limited *Nov 2017 – June 2019*

- Led the network surveillance and maintenance of a nationwide network.

Publications

Journals

1. **Design and Implementation of ARA Wireless Living Lab for Rural Broadband and Applications** *May 2025*

   Computer Networks

   Taimoor Ul Islam, Joshua Ofori Boateng, ***Md Nadim***, Guoying Zu, Mukaram Shahid, Xun Li, Tianyi Zhang, Salil Reddy, Wei Xu, Ataberk Atalar, Vincent Lee, Yung-Fu Chen, Evan Gosling, Elisabeth Permatasari, Christ Somiah, Zhibo Meng, Sarath Babu, Mohammed Soliman, Ali Hussain, Daji Qiao, Mai Zheng, Ozdal Boyraz, Yong Guan, Anish Arora, Mohamed Selim, Arsalan Ahmad, Myra B Cohen, Mike Luby, Ranveer Chandra, James Gross, Hongwei Zhang.

Conferences

1. **AraOptical System and Testbed for Long-Range, High-Capacity FSOC in Rural Wireless X-Haul Networks** *Accepted*

   ACM CoNEXT 2025: The 21st International Conference on emerging Networking EXperiments and Technologies, Hong Kong.

   Md Nadim, Xun Li, Ataberk Atalar, Salil Reddy, Sarath Babu, Arsalan Aahmad, Ozdal Boyraz, Daji Qiao, Anish Arora, Hongwei Zhang.

2. **Real-World Integration and Evaluation of Open-Source 5G Core with Commercial RAN** *Accepted*

   IEEE MILCOM 2025: IEEE Military Communications Conference, Los Angels, CA, USA.

   Guoying Zu, Joshua Ofori Boateng, Varun S. Advani, Taimoor Ul Islam, Vincent Lee, Sarath Babu, ***Md Nadim***, Daji Qiao, Mohamed Y. Selim, Hongwei Zhang.

3. **AraSync: Precision Time Synchronization in Rural Wireless Living Lab** *Dec 2024*

   ACM MobiCom '24: Proceedings of the 30th Annual International Conference on Mobile Computing and Networking, Washington, D.C., USA.

   Md Nadim, Taimoor Ul Islam, Salil Reddy, Tianyi Zhang, Zhibo Meng, Reshal Afzal, Sarath Babu, Arsalan Ahmad, Daji Qiao, Anish Arora, and Hongwei Zhang.

4. **Real-Time Liquid Wireless Transport for Video Streaming in Rural and Agricultural Applications** *Mar 2024*

   ACM MHV '24: Proceedings of the 3rd Mile-High Video Conference, Denver, CO, USA.

   E. K. A. Permatasari, E. Gosling, ***Md Nadim***, S. Babu, D. Qiao, H. Zhang, M. Luby, J. W. Byers, L. Minder, and P. Aggrawal

5. **AraHaul: Multi-Modal Wireless X-Haul Living Lab for Long-Distance, High-Capacity Communications** *Nov 2023*

   2023 IEEE Future Networks World Forum (FNWF), Baltimore, MD, USA.

   Guoying Zu, ***Md Nadim***, Salil Reddy, Taimoor Ul Islam, Sarath Babu, Tianyi Zhang, Daji Qiao, Hongwei Zhang, Anish Arora.

Demos and Posters

1. **Demo: Real-World Integration and Evaluation of Open-Source 5G Core with Commercial RAN** *Accepted*

   IEEE MILCOM 2025: IEEE Military Communications Conference, Los Angels, CA, USA.

   Guoying Zu, Joshua Ofori Boateng, Varun S. Advani, Taimoor Ul Islam, Vincent Lee, Sarath Babu, ***Md Nadim***, Daji Qiao, Mohamed Y. Selim, Hongwei Zhang.

2. **Long-range, high-capacity FSOC system for rural wireless x-haul using COTS transceivers** *Accepted*

   ECOC '25: 51th European Conference on Optical Communication, Copenhagen, Denmark.

   Xun Li, Ataberk Atalar, ***Md Nadim***, Sarath Babu, C. J. Margison, M. M. Bayer, A. Ahmad, D. Qiao, H. Zhang, and O. Boyraz

3. **Demo: AraSync: Precision Time Synchronization in Rural Wireless Living Lab** *Nov 2024*

   ACM MobiCom '24: The 30th Annual International Conference on Mobile Computing and Networking, Washington, D.C., USA.

   Md Nadim, Taimoor Ul Islam, Salil Reddy, Tianyi Zhang, Zhibo Meng, Reshal Afzal, Sarath Babu, Arsalan Ahmad, Daji Qiao, Anish Arora, and Hongwei Zhang.

4. **ARA PAWR: Enabling Wireless Experiments with Commercial Off-the-Shelf RAN and X-Haul Platforms** [Best Demo Award] *Sep 2024*

   MERIF '24: Midscale Experimental Research Infrastructure Forum, Kansas City, MO, USA.

Taimoor Ul Islam, ***Md Nadim***, Guoying Zu, Vincent Lee, Owen Perrin, Joshua Ofori Boateng, Mukaram Shahid, Tianyi Zhang, E.K.A. Permatasari, Zhibo Meng, Sarath Babu, Daji Qiao, Hongwei Zhang

5. **ARA PAWR: Wireless Living Lab for Smart and Connected Rural Communities** *Oct 2023*

   ACM MobiCom '23: Proceedings of the 29th Annual International Conference on Mobile Computing and Networking, Madrid, Spain.

   Taimoor U. Islam, Joshua O. Boateng, Guouing Zu, Mukaram Shahid, ***Md Nadim***, Wei Xu, Tianyi Zhang, Salil Reddy, Xun Li, Ataberk Atalar, Yung-Fu Chen, Sarath Babu, Hongwei Zhang, Daji Qiao, Mai Zheng, Yong Guan, Ozdal Boyraz, Anish Arora, Mohamed Selim, Myra B. Cohen.

Technical Reports

1. **A Long-Range, High-Capacity FSOC System in Heterogeneous and Multi-Modal Rural Wireless X-Haul Networks** *Aug 2025*

   Iowa State University Digital Repository

   Md Nadim

Projects

ARA: Wireless Living Lab
NSF-Funded PAWR Research Initiative
Research, Development and Operation Team Lead — AraHaul: Wireless Xhaul Mesh Network

- Co-led the design and deployment of a cutting-edge Wireless Living Lab supporting smart rural connectivity.
- Planned and implemented mmWave and Microwave Xhaul Mesh Networks for backhaul resilience.
- Led state-of-the-art Free Space Optical Communication (FSOC) link design for long-range, high-speed rural internet
- Oversaw IP addressing scheme and Layer 2/3 network planning for the entire ARA testbed.
- Developed and implemented Precision Time Protocol (PTP) synchronization strategies for cross-site timing accuracy.

RAISE: AraOptical 2.0: MISO Free-Space Optical Communications for Long-Distance, High-Capacity X-Haul Networking
NSF-Funded Research & Development

- Lead member in the research, development, implementation, and real-world experimentation of MISO-based Free-Space Optical systems for high-capacity, long-distance X-Haul networking.

CNS Core: Medium: Real-Time Liquid Wireless Networking for Data-Intensive Rural Applications
NSF-Funded Research and Development

- Lead member of transport-layer research, development, and real-world implementation of data-intensive wireless networking solutions for rural applications.

Auto Fiber Link Detection: Developed logic-based script to detect outages and send alerts in real time.
Link Database Automation: Built a tool to automatically flag and block out-of-band spectrum uploads using logic rules.
Whole Slide Image Scanner, Two-Wheel Balancing Robot, Home Automation System: Course-based hardware/software integration projects using sensors, microcontrollers, and circuit design tools.

Awards, Scholarships, and Recognition

Recognition Award: The Department of Electrical and Computer Engineering, Iowa State University *Oct 2024*

- Best Demo at the NSF MERIF Forum

Best Demo Award: NSF Midscale Experimental Research Infrastructure Forum (MERIF) *Sep 2024*

- ARA PAWR - Enabling Wireless Experiments with Programmable COTS RAN and X-Haul Platforms.

Travel Grant: MERIF Workshop *Sep 2024*
Takano Fellowship: Iowa State University *2022-2023*
Star Performer of Q3'21: Technology Division, Robi Axiata Limited *2021*
Technical award at every academic year of BUET *2013-2017*

Professional Affiliations

Institute of Electrical and Electronics Engineers (IEEE)

- Graduate Student Member — *Aug 2024 – Present*
- Professional Member — *Feb 2018 – Feb 2019*
- Vice Chair, IEEE BUET Student Branch — *Mar 2017 – Sep 2017*

Association of Computing Machinery (ACM)

- SIGMOBILE Member — *Nov 2018 – Present*
- Professional Member — *Nov 2018 – Present*

Professional Activities

Journal Reviews

- IEEE Transactions on Wireless Communications (IEEE TWC)

Synergistic and Leadership activities

Event Convener, Organizer and Treasurer — *Mar 2017 - May 2017*
Orion EEE DAY 2017

General Secretary — *Mar 2017 - Oct 2017*
BUET Dance Club

Vice President — *Mar 2017 - Oct 2017*
BUET Drama Society

Organizing Secretary — *Mar 2017 - Oct 2017*
BUET Energy Club

Technologies

Languages: C++, C, Python, Assembly, Java, C#

Networking Tools: Pathloss, MapInfo Pro, U2020/U2000, UNMS, Mini Link Craft

Simulation/Design: MATLAB, Simulink, Proteus, PSPICE, AutoCAD

Others: MS Office, LaTeX, Linux

Extra-curricular activities

Cricket

- Player of Faculty Cricket Team (ECE Faculty)
- Player of Departmental Cricket Team (Department of EEE)

Cycling

- Member of BD Cyclist, BUET Branch

Photography

- Member of BUET Photographic Society