

# Md Ashiqur Rahman

PHD CANDIDATE · PROBLEM SOLVER · RESEARCHER

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## Skills

**Coding & Tools:** C, C++ ; familiar with Scala, Python, Java, C# ; Shell scripting, GDB, Docker, NS-3, CSIM, MySQL, Git, Linux.

**Research:** Internet Architecture, Computer Networks, Probabilistic routing, Protocol design, Scheduling algorithms.

**Other topics:** Database and Operating Systems, Information Retrieval, Object-oriented Design, Agile, CI/CD.

## Education

### PhD Candidate in Computer Science (exp. grad. May 2022)

Aug 2016 - Present

THE UNIVERSITY OF ARIZONA, TUCSON, AZ, USA (GPA: 3.75 / 4.00)

Dissertation topic: Data-centric Wireless Networks.

### Master of Science in Computer Science

Aug 2016 - May 2020

THE UNIVERSITY OF ARIZONA, TUCSON, AZ, USA (GPA: 3.75 / 4.00)

### Bachelor of Science in Computer Science and Engineering

Feb 2011 - May 2015

KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY (KUET), KHULNA, BANGLADESH (GPA: 3.60 / 4.00)

## Work Experience

### Graduate Associate (RA/TA)

Aug 2016 - Present

COMPUTER SCIENCE, THE UNIVERSITY OF ARIZONA, TUCSON, AZ, USA

- **Network Research Lab:** Analyzing Named Data Networking (NDN) and its protocol stack optimization in wireless networks.
- **Software Development:** Student developer, Named Data Forwarding Daemon (<https://github.com/named-data/NFD>).
- **Teaching Associate:** Computer Networks, Operating Systems.

### Summer Instructor

Jun - Aug (2020, 2021)

COMPUTER SCIENCE, THE UNIVERSITY OF ARIZONA, TUCSON, AZ, USA

- **2021:** Systems Programming and UNIX (C programming, FILE I/O, memory management, and Shell scripting).
- **2020:** Software Development (development practices, testing, algorithms, and data structures using Java).

### Lecturer

Sep 2015 - Jul 2016

COMPUTER SCIENCE AND ENGINEERING, DAFFODIL INTL. UNIVERSITY (DIU), DHAKA, BANGLADESH

- **Mentor:** Competitive Programming (beginner and intermediate).
- **Courses instructed:** Algorithms, Data Structures, Programming and Problem Solving, Software Engineering.

### Undergraduate Researcher

Apr 2014 - May 2015

COMPUTER SCIENCE AND ENGINEERING, KUET, KHULNA, BANGLADESH (WITH DR. G.G. NAWAZ ALI)

- **Thesis:** Minimizing wireless broadcast and latency in V2I communication for improved road-safety and infotainment.

## Key Projects

### NDN in wireless, ad-hoc, and delay-tolerant networks (C++, NS-3).

2016 - Ongoing

- Optimizing NDN's data-centric approach in wireless networks.
- Improved application data retrieval rate and throughput by reducing network latency and overhead.
- **Publications** in IC3N, and LNC 2021, ICC Workshops 2020 (Google Scholar: <https://bit.ly/gscholar-ashigrahman>).

### Network Coded Data Dissemination in RSU-based Vehicular networks (C, CSIM).

2014 - 2019

- Minimizing wireless broadcast and Vehicle-to-RSU communication latency for improving road-safety and infotainment.
- Achieved significant lower latency and wireless broadcast overhead with high data-retrieval rate.
- **Published seven papers;** two as first, two as second and three as third author.

### Supporting Multi-Level Annotations for Medical Literature (Python, Tensorflow, Docker)

Aug - Dec 2018

- Capturing higher context information near all hot-word neighbors.
- Near-SotA performance with significantly lower model training time.

### Implemented Heapfile manager, Buffer manager, B+ tree in a DBMS (C, MINIBASE).

Aug - Dec 2017

### Software router with ARP and PWOSPF protocols for shortest path forwarding (C).

Aug - Dec 2016

## Honors & Awards

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May 2021	<b>Winner</b> , 11th NDN Hackathon	<i>Virtual</i>
Mar 2019	<b>2nd Runners-up</b> , 8th NDN Hackathon at University of California, Los Angeles	<i>LA, CA, U.S.A</i>
May 2018	<b>Winner</b> , 6th NDN Hackathon at Florida International University	<i>Miami, FL, U.S.A</i>
Mar 2017	<b>Winner</b> , 4th NDN Hackathon at University of Memphis	<i>Memphis, TN, U.S.A</i>
2014-15	<b>Dean's list award</b> , Academic excellence, KUET	<i>Khulna, Bangladesh</i>
Jul 2014	<b>Position 24</b> , IUT 6th National ICT Fest 2014 Programming Contest	<i>Dhaka, Bangladesh</i>
Jun 2012	<b>2nd Runner-up</b> , GPIT CSE Festival 2012 Programming Contest, KUET	<i>Khulna, Bangladesh</i>

## Publications

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### On Data-centric Forwarding in Mobile Ad-hoc Networks: Baseline Design and Simulation Analysis

*Athens, Greece*

THE 30TH INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATIONS AND NETWORKS (ICCCN 2021)

*July 2021*

- Md Ashiqur Rahman ; Beichuan Zhang

### On the Analysis of Adaptive-Rate Applications in Data-Centric Wireless Ad-Hoc Networks

*Edmonton, Canada*

2021 IEEE 46TH CONFERENCE ON LOCAL COMPUTER NETWORKS (LCN) [ACCEPTED]

*October 2021*

- Md Ashiqur Rahman ; Beichuan Zhang

### Enabling Named Data Networking Forwarder to Work Out-of-the-box at Edge Networks

*Virtual*

2020 IEEE INTERNATIONAL CONFERENCE ON COMMUNICATIONS WORKSHOPS (ICC WORKSHOPS)

*June 2020*

- Teng Liang, Ju Pan, Md Ashiqur Rahman, Junxiao Shi, Davide Pesavento, Alexander Afanasyev, Beichuan Zhang

### Cooperative Cache Transfer-based On-demand Network Coded Broadcast in Vehicular Networks

*ACM*

ACM TRANSACTION ON EMBEDDED COMPUTING SYSTEMS

*May, 2019*

- G. G. MD. Nawaz Ali; MD. Noor-A-Rahim; Md. Ashiqur Rahman; Beshah Ayalew; Peter H. J. Chong; Yong Liang Guan

### An Efficient Cross-layer Coding-assisted Heterogeneous Data Access in Vehicular Networks

*Kansas City, MO, USA*

2018 IEEE INTERNATIONAL CONFERENCE ON COMMUNICATIONS (ICC)

*May. 2018*

- GGM Nawaz Ali, Md Noor-A-Rahim, Md A Rahman, Syeda Khairunnesa Samantha, Peter HJ Chong, Yong Liang Guan

### Efficient Real-time Coding-assisted Heterogeneous Data Access in Vehicular Networks

*IEEE*

IEEE INTERNET OF THINGS JOURNAL

*Apr. 2018*

- G. G. Md. Nawaz Ali ; Md. Noor-A-Rahim ; Md. Ashiqur Rahman ; Syeda K. Samantha ; Peter Han Joo Chong ; Yong Liang Guan

### Efficient coding based heterogeneous data access in vehicular networks

*Paris, France*

2017 IEEE INTERNATIONAL CONFERENCE ON COMMUNICATIONS (ICC)

*May. 2017*

- G. G. M. Nawaz Ali ; Md. A. Rahman ; S. K. Samantha ; Yumeng Gao ; Peter H.J. Chong ; Y. L. Guan

### On Accessing Heterogeneous Data Items Using Network Coding in Wireless Broadcast

*Montreal, QC, Canada*

2016 IEEE 84TH VEHICULAR TECHNOLOGY CONFERENCE (VTC-FALL)

*Sept. 2016*

- Md. Ashiqur Rahman ; G. G. Md. Nawaz Ali ; Yumeng Gao ; Syeda K. Samantha ; Peter H. J. Chong

### On Scheduling Real-Time Multi-item Query with Network Coding in Multi-RSU VANETs

*Daegu, S. Korea*

2016 IEEE 22ND INTL. CONF. ON EMBEDDED AND REAL-TIME COMPUTING SYSTEMS AND APPLICATIONS (RTCSA)

*Aug. 2016*

- Md. A. Rahman ; G.G.M. Nawaz Ali ; Peter H.J. Chong ; S.K. Samantha ; M.F. Muntasir ; C. Chen

### On Efficient Data Dissemination Using Network Coding in Multi-RSU VANETs

*Nanjing, China*

2016 IEEE 83RD VEHICULAR TECHNOLOGY CONFERENCE (VTC SPRING)

*May. 2016*

- G. G. Md. Nawaz Ali ; Md. Ashiqur Rahman ; Peter Han Joo Chong ; Syeda Khairunnesa Samantha