

# Md Ashiqur Rahman

PHD CANDIDATE & MS IN COMPUTER SCIENCE

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## Skills

Computer Networks, Routing in mobile ad-hoc networks, packet scheduling with network coding in RSU-based vehicular ad-hoc networks (V2I).

**Coding** C/C++, familiar with Java, Scala, Python

**Others** DBMS, Information retrieval, NS-3, CSIM

## Education

### The University of Arizona

AZ, U.S.A

PHD CANDIDATE, COMPUTER SCIENCE (COURSEWORK GPA: 3.75) 2016 - 05/2021

### The University of Arizona

AZ, U.S.A

MS TOWARDS PHD, COMPUTER SCIENCE (GPA: 3.75) 2016 - 2020

### Khulna Univ. of Engineering & Technology (KUET) Bangladesh

BS IN COMPUTER SCIENCE AND ENGINEERING (GPA: 3.60) 2011 - 2015

## Experience

### Graduate Associate, The University of Arizona

AZ, U.S.A

RESEARCH 2016 - Present

- Named Data Networking (NDN) in mobile ad-hoc, delay-tolerant and challenging networks.

TEACHING 2016 - Present

- In-person: CSC 210 Software Development (Summer 2020)
- TA: CSC 425 Computer Networks; CSC 452 Operating Systems

### Computer Sc. & Engrg., Daffodil Intl. Univ. (DIU) Bangladesh

INSTRUCTOR 2015 - 2016

- Mentor: Competitive Programming (Beginner-Intermediate).
- Courses instructed: CSE 221 Algorithms; CSE 134 Data Structures.

### Computer Science and Engineering, KUET

Bangladesh

LEAD UNDERGRADUATE RESEARCHER (WITH DR. G.G. NAWAZ ALI) 2014 - 2015

- Studying scheduling algorithms and applications of Network Coding in On-demand Vehicular Ad-hoc Networks.

### SGIPC (Special Group of Interest in Programming Contests), KUET Bangladesh

WORKSHOP MANAGER AND TRAINER 2012 - 2015

## Honors & Awards

2019 **2nd Runners-up**, 8th NDN Hackathon at UCLA, CA, USA

2018 **Winner**, 6th NDN Hackathon at FIU, FL, USA

2017 **Winner**, 4th NDN Hackathon at Univ. of Memphis, TN, USA

## Relevant Coursework

GRADUATE 2016-Present

- Principles of Computer Networking, Database Systems and Implementation, Algorithms in NLP, Information Retrieval, Operating Systems.

UNDERGRADUATE 2011-2015

- Computer Networks, Machine Learning, Data Mining, Data Structures and Algorithms, Algorithm Analysis and Design, Data Communication.

## Projects

### NDN in mobile ad-hoc, delay-tolerant and challenging networks.

Ongoing

- Problem:** Identify existing IP-network limitations and improve network performance in mobile ad-hoc, delay-tolerant networks.
- Primary solution:** Understanding effect of NDN-based Interest-Data exchange on network performance.
- Sub-solution-1:** RTT-based hop-by-hop neighbor update for fast reaction to network dynamics.
- Sub-solution-2:** Neighborhood measurement in long-delay networks.
- Expected outcome:** High data retrieval rate at low latency under moderate to high mobility and high reliability in long-delay communication.
- Tools:** ndnSIM (built on NS-3), C++

### Network Coded Data Dissemination in RSU-based Vehicular Ad-hoc Networks (VANETs)

2014-2019

- Problem:** Minimize wireless broadcast data transmissions and overall Vehicle-to-RSU communication latency in VANETs to provide improved road-safety and infotainment.
- Primary solution:** Network coded wireless broadcast with optimized scheduling algorithms for time sensitive data request
- Sub-solution-1:** Co-operative RSU-to-RSU cache information transfer which excludes explicit upload by vehicles.
- Sub-solution-2:** Coding for heterogeneous data with weighted moving average of maximum data size in a clique.
- Sub-solution-3:** Time-sensitive heuristic coding for heterogeneous data in real-time multi-item query.
- Results:** Significant lower latency and wireless broadcast overhead with high data-retrieval rate.
- Publications:** Two Journals and four Conference papers. Two as first author, two as second and two as third ([Google Scholar](#)).
- Tools:** CSIM

### Weighted Dropout: Supporting Multi-Level Annotations for Medical Literature on Patient, Interventions and Outcomes

2018

- Problem:** Annotating abstracts from medical literature.
- Solution:** Variable-dropout based on distance from tokens of interest.
- Maintains** higher context information from all hot-word neighbors.
- Outcome:** Near-SotA performance with near-half model training time.
- Tools:** Python, Tensorflow, Docker.

### Components of MINIBASE DBMS in C

2017

- Implemented self-resizing Heapfile manager, Buffer manager
- Implemented B+ tree (non-balancing)

### Building (a part of) Watson

2017

- An end-to-end Information Retrieval system that indexes a large set of Wikipedia pages to retrieve top relevant pages for short queries similar to the Jeopardy game.
- Tools:** Scala, Apache Maven, Lucene.

### Email Spam classifier

2017

- Built a spam classifier model by training with spam labeled/unlabeled dataset and finding similarity between unknown dataset
- Tools:** Scala, Apache Maven, Lucene.

### Implementing a Software Router in C

2016

- Problem:** forward IP packets under possible link changes.
- Solution:** Wrote the ARP protocol, IP forwarding, and PWOSPF routing algorithm that can react to link changes.

### Gas Station Automation

2014

- Easy and secured management of gas station's monetary, repository, and human resources and report generation using cloud services.
- Tools:** C#, SQL, ASP.NET, Crystal Report, JavaScript