Md **Ashiqur Rahman**

PhD Candidate & MS in Computer Science

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Skills

Research 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 - 05/2020*

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
- 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 sheduling 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

2014 **Winner**, Water Hackathon App Fest by WORLD BANK, BGD

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.
- **Publications:** One under review at IEEE Globecom 2020.
- 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 very low 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