Md Kamran Chowdhury Shisher

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Education

Ph.D. in Electrical Engineering   **Aug. 2018 – Present**
Auburn University, Auburn, AL; Advisor: Yin Sun   *CGPA: 4.00/4.00*

M.S. in Electrical Engineering   **Aug. 2018 – Aug. 2022**
Auburn University, Auburn, AL; Advisor: Yin Sun   *CGPA: 4.00/4.00*

B.Sc. in Electrical and Electronics Engineering   **Feb. 2013- Sep. 2017**
Bangladesh University of Engineering and Technology   *CGPA: 3.80/4.00*

Research Interests

Communication Networks
Information Freshness
Machine Learning
Information Theory
Multi-armed Bandit
Reinforcement Learning
Optimization and Decision Theory

Work Experience

Research Assistant, Real-time Networking Lab, Auburn University   Fall 2018-present

- **Project 1: Impact of Fresh Features on Machine Learning**

  We conducted five supervised learning-based experiments to understand the impact of fresh features. The experiments include: **robot state prediction, video prediction, channel state information prediction, temperature prediction, and solar power prediction**. The experimental results show that (i) for Markov data sequence, the fresh feature is always better and (ii) for non-Markov data sequence, a fresh feature may not be better. For both Markov and non-Markov sequences, we developed an information-theoretic tool to interpret and analyze the impact of fresh features.

- **Project 2: Scheduler for Single Source-Predictor Pair Remote Inference System**

  Based on insights from Project 1, we designed new **feature selection strategies** and selection-from-buffer **scheduling algorithms** for improving the performance of a remote inference system.

- **Project 3: Scheduler for Multiple Source-Predictor Pairs Remote Inference System**

  Scheduling and feature selection problem for multiple source-predictor pairs is a **restless multi-armed bandit** problem with multiple actions. In this case, we designed new asymptotically optimal algorithms.

Teaching Assistant, ELEC-5970: Applied Statistical and Machine Learning, Auburn University   Spring 2023

- Delivered in-class coding lectures on K-nearest neighbors algorithm, SVM, decision tree, XGBoost, neural network, image classification with transfer learning, text classification with LSTM.

Teaching Assistant, ELEC-7970: Reinforcement Learning, Auburn University   Spring 2020-2022, Fall 2022

- Delivered in-class coding lectures on value iteration, policy iteration, temporal difference, SARSA, Q-learning, DQN, and REINFORCE algorithms.

Publications

Preprints and under review:

1. **Md Kamran Chowdhury Shisher** and Yin Sun, "On the Monotonicity of Information Aging," under review in *IEEE INFOCOM ASoI Workshop*, 2024.

2. **Md Kamran Chowdhury Shisher**, Yin Sun, and I-Hong Hou, "Timely Communications for Remote Inference," under review in *IEEE/ACM Transactions on Networking*, 2023.

3. Cagri Ari, **Md Kamran Chowdhury Shisher**, Elif Uysal, and Yin Sun, "Goal-Oriented Communications for Remote Inference with Two-Way Delay," under review in *IEEE ISIT*, 2024.

Peer-reviewed Journal Papers:

4. **Md Kamran Chowdhury Shisher**, Bo Ji, I-Hong Hou, and Yin Sun, "Learning and Communications Co-Design for Remote Inference Systems: Feature Length Selection and Transmission Scheduling," *IEEE Journal on Selected Areas in Information Theory*, vol. 4, pp. 524-538, 2023.

5. Kevin Yan, **Md Kamran Chowdhury Shisher**, and Yin Sun, "A Transfer Learning-Based Deep Convolutional Neural Network for Detection of Fusarium Wilt in Banana Crops," *AgriEngineering*, vol. 5, no. 4, pp. 2381-2394, 2023.

Peer-reviewed Conference Papers:

6. Tasmeen Zaman Ornee, **Md Kamran Chowdhury Shisher**, Clement Kam, and Yin Sun, "Context-aware Status Updating: Wireless Scheduling for Maximizing Situational Awareness in Safety-critical Systems," *IEEE MILCOM QuAVoI Workshop*, 2023.

7. **Md Kamran Chowdhury Shisher** and Yin Sun, "How Does Data Freshness Affect Real-time Supervised Learning?" *ACM MobiHoc*, 2022. [**Acceptance Rate: 19.8%**]

8. **Md Kamran Chowdhury Shisher**, Heyang Qin, Lei Yang, Feng Yan, and Yin Sun, "The Age of Correlated Features in Supervised Learning based Forecasting," *IEEE INFOCOM AoI Workshop*, 2021.

9. **Md. Kamran Chowdhury Shisher**, Tasmeen Zaman Ornee, and Md. Farhad Hossain, "QoS aware user association in massive MIMO enabled hetnets for DTU and NDTU traffic," *IEEE ICAEE*, 2017.

Talks

Learning and Communications Co-design For Remote Inference: Feature Length Selection and Transmission Scheduling

- Invited Talk at University of Maryland, College Park, MD   Oct 2023

- Graduate Engineering Research Showcase, Auburn University   Oct 2023

Communications of Timely Information for Real-time Machine Learning and Networked Intelligence
North American School of Information Theory, Philadelphia, PA   June 2023
How Does Data Freshness Affect Real-time Supervised Learning?

- Information Theory Application Workshop, San Diego, CA   Feb 2023

- Auburn University Research Symposium   March 2023

- ACM MobiHoc, Seoul, South Korea.   Oct 2022

- College of Engineering Research Showcase at the U.S. Space and Rocket Center, Huntsville, AL   Aug 2022

The Age of Correlated Features in Supervised Learning based Forecasting
IEEE INFOCOM AoI Workshop, Vancouver, BC, Canada (virtual)   May, 2021

Student Mentoring

Cagri Ari, Middle East Technical University Graduate Student

- Designed scheduling strategies for goal-oriented communications for remote inference systems with two-way delay.

- A paper is submitted at IEEE ISIT, 2024.

Mengxue Li, Tuskegee University Graduate Student

- Currently working on a food pantry visit forecasting project.

- Project webpage: https://github.com/Kamran0153/Food-Pantry-Household-Visit-Forecasting

Justin Tran, Auburn University Undergraduate Student

- Worked on optimal pilot scheduling for throughput maximization.

- Project webpage: http://webhome.auburn.edu/~yzs0078/project_Justin/project_Justin.html

Kevin Yan, Auburn High School Student

- Worked on transfer learning-based Deep Convolutional Neural Network for Detection of Fusarium Wilt in Banana Crops.

- A paper from this project is published in *AgriEngineering*.

Awards and Honors

Candidate Profile, ACM SIGMETRICS Performance Evaluation Review	Dec 2023
published in a special issue on job market candidates.	
NSF Student Travel Grant, ACM MobiHoc	Oct 2023
to attend ACM MobiHoc 2023 in Washington, D.C.	
NSF Travel Grant, North American School of Information Theory	June 2023
to attend and present poster at NASIT 2023 in Philadelphia, PA.	
ACM SIGMOBILE Student Travel Grant, ACM MobiHoc	Oct 2022
to attend and present paper at ACM MobiHoc 2023 in Seoul, Korea.	
IEEE INFOCOM Student Conference Grant	June 2022
to attend IEEE INFOCOM virtually.	
NSF Student Conference Award, IEEE INFOCOM	June 2022
to attend and present paper at IEEE INFOCOM 2021 virtually.	
Dean's Award, BUET, Bangladesh	2017, 2016, 2015
for outstanding academic performance in those years.	
Best Cadet, Rangpur Cadet College	2012
for outstanding academic performance during 2006-2012	
SSC Scholarship (Talent), Government of Bangladesh	2010
for outstanding results in SSC examination	
Primary Scholarship (Talent), Government of Bangladesh	2005
for outstanding results in Primary Scholarship examination	

Services

TPC member

- IEEE WCNC, 2021
- IEEE WCNC, 2022

Reviewer for Journal Manuscript Submissions

- IEEE Journal of Communications and Networks, 2023
- IEEE Journal on Selected Areas in Information Theory, 2023

- IEEE Open Journal of the Communications Society, 2023
- IEEE Transactions on Wireless Communications, 2022
- IEEE Journal on Selected Areas in Communication, 2020
- IEEE Journal of Communications and Networks, 2020

Reviewer for Conference Manuscript Submissions

- IEEE ISIT, 2022
- IEEE WCNC, 2022
- IEEE INFOCOM, 2022
- IEEE WCNC, 2021
- IEEE INFOCOM, 2020
- IEEE INFOCOM AoI Workshop, 2020
- IEEE INFOCOM AoI Workshop, 2019

Maintainer of an **online paper repository on Age of Information**	Aug 2018-Aug 2021
Volunteer on E-Day, Auburn University, Auburn, AL	Feb 2020
Organizing Secretary, Bangladesh Student Organization, Auburn University	2022-2023
House Cultural Prefect, Rangpur Cadet College, Bangladesh	2011-2012
Junior Prefect, Rangpur Cadet College, Bangladesh	2011

Professional Membership

IEEE Member
IEEE Information Theory Society Member
IEEE Communication Society Member
ACM SIGMOBILE Member

References

Prof. Yin Sun, yzs0078@auburn.edu, Auburn University
Prof. I-Hong Hou, ihou@tamu.edu, Texas A&M University
Prof. Shiwen Mao, smao@auburn.edu, Auburn University
Prof. Elif Uysal, uelif@metu.edu.tr, Middle East Technical University