

# MD KAMRAN CHOWDHURY SHISHER

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## Education

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### Ph.D. in Electrical Engineering

*Auburn University, Auburn, AL; Advisor: Yin Sun*

**Aug. 2018 – Present**

*CGPA: 4.00/4.00*

### M.S. in Electrical Engineering

*Auburn University, Auburn, AL; Advisor: Yin Sun*

**Aug. 2018 – Aug. 2022**

*CGPA: 4.00/4.00*

### B.Sc. in Electrical and Electronics Engineering

*Bangladesh University of Engineering and Technology*

**Feb. 2013- Sep. 2017**

*CGPA: 3.80/4.00*

## Research Interests

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Communication Networks

Semantic Communications

Information Freshness

Information Theory

Reinforcement Learning

Optimization and Decision Theory

## Work Experience

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**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.

### 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*, 2023.
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,” 2023.  
Technical report: <https://webhome.auburn.edu/~yzs0078/CagriICC2024.pdf>

### 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

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### 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

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**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 ICC, 2024 [3].  
Technical report: <https://webhome.auburn.edu/~yzs0078/CagriICC2024.pdf>

**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](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* [5].

## Awards and Honors

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

## Services

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**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

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IEEE Member

IEEE Information Theory Society Member

IEEE Communication Society Member

ACM SIGMOBILE Member

#### References

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**Prof. Yin Sun**, yzs0078@auburn.edu, Auburn University

**Prof. Bo Ji**, boji@vt.edu, Virginia Tech

**Prof. I-Hong Hou**, ihou@tamu.edu, Texas A&M University

**Prof. Shiewen Mao**, smao@auburn.edu, Auburn University

**Prof. Elif Uysal**, uelif@metu.edu.tr, Middle East Technical University