Md Kamran Chowdhury Shisher

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GitHub: https://github.com/Kamran0153

EDUCATION

Ph.D. Candidate in Electrical Engineering — Aug. 2018-Present
Auburn University, AL
Advisor: Yin Sun

M.Sc. in Electrical Engineering, CGPA: 4.00 — Aug. 2022
Auburn University, AL

B.Sc. in Electrical and Electronic Engineering, CGPA: 3.80 — Sep. 2017
Rank: 21/214
Bangladesh University of Engineering and Technology (BUET), Bangladesh

RESEARCH INTERESTS

Information Freshness
Wireless Networks
Semantic Communications
Machine Learning
Reinforcement Learning

PUBLICATIONS

[1] **Md Kamran Chowdhury Shisher**, I-Hong Hou, and Yin Sun, "Timely Communications for Remote Inference," *in preparation*, 2023.

[2] **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*, 2023.

[3] 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," accepted by *IEEE MILCOM QuAVoI Workshop*, 2023.

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

[5] **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.

[6] **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.

RESEARCH EXPERIENCE

- **Fresh Features in Time-series Forecasting:** We interpret the impact of fresh features on time-series forecasting by using information theoretic tools and experiments based on supervised learning. Our experiments include: (i) video prediction, (ii) robot state prediction, (iii) wireless channel prediction, (iv) actuator state prediction, and (v) solar power prediction.

- **Timely Communication for Remote Inference:** In a remote inference system, feature sequences are progressively sent from a remote transmitter to a neural network. To min-

imize long-term average inference error, We study optimal scheduling algorithm that decides which feature to send and when to send.

- **Inference and Communication Co-design:** A longer feature can provide better learning performance, but it often requires more communication resources. We study co-design problem that jointly optimizes length of feature sequences and transmission scheduling for remote inference systems. We utilize dynamic programming and Lagrangian optimization to design novel algorithms. MATLAB is used for the implementation of the algorithms.

TEACHING

1. **Teaching Assistance:**

Courses

- ELEC-5970: Applied Statistical and Machine Learning, Auburn University Spring 2023
- ELEC-2120: Signals and Systems, Auburn University Fall 2022
- ELEC-7970: Reinforcement Learning, Auburn University Fall 2022
- ELEC-7970: Reinforcement Learning, Auburn University Spring 2022
- ELEC-7970: Reinforcement Learning, Auburn University Spring 2021
- ELEC-7970: Reinforcement Learning, Auburn University Spring 2020

Roles
ELEC-5970: Applied Statistical and Machine Learning:
Designed and conducted lab lectures on K-nearest neighbors algorithm, SVM, decision tree, XGBoost, neural network, image classification with transfer learning, text classification with LSTM.

ELEC-7970: Reinforcement Learning:
Designed and conducted lab lectures on value iteration, policy iteration, temporal difference, SARSA, Q-learning, deep Q network, and REINFORCE algorithms.

ELEC-2120: Signals and Systems:
Conducted labs on understanding and visualization of fundamentals properties of linear time invariant systems by using MATLAB and TIMS module.

2. **Lecturer** November 2017-June 2018
Bangladesh Army University of Science & Technology
Selected Courses:
EEE 4133: Telecommunication Engineering
EEE 3107: Electrical Properties of Materials
EEE 3203: Communication Engineering Sessional

TALKS

1. Communications of Timely Information for Real-time Machine Learning and Networked Intelligence, **NASIT**, University of Pennsylvania, Philadelphia, PA. Available: [Online]
2. How Does Data Freshness Affect Real-time Supervised Learning? **ITA**, San Diego, CA, 17 Feb. 2022. Available: [Online]
3. How Does Data Freshness Affect Real-time Supervised Learning? **ACM MobiHoc**, Seoul, South Korea, 18 Oct. 2022. Available: [Online]
4. An Interpretation of Information Freshness in Real-time Supervised Learning, **Ph.D. General Examination** (Proposal Defense), Auburn University. Available: [Online]
5. How Does Data Freshness Affect Real-time Supervised Learning? **Auburn University Research Symposium**. Available: [Online]
6. How Does Data Freshness Affect Real-time Supervised Learning? **the College of Engineering Research Showcase at the U.S. Space and Rocket Center**, Huntsville, AL, 2022.
7. The Age of Correlated Features in Supervised Learning based Forecasting", **IEEE INFOCOM AoI Workshop**, Virtual, 2021.

PROFESSIONAL MEMBERSHIP

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

AWARDS

North American School of Information Theory NSF Travel Grant	2023
ACM SIGMOBILE Student Travel Grant	2022
IEEE INFOCOM Student Conference Grant	2021
IEEE INFOCOM NSF Student Conference Award	2021
Dean's Award, BUET, Bangladesh	2017
Dean's Award, BUET, Bangladesh	2016
Dean's Award, BUET, Bangladesh	2015
Best Cadet in Academic, Rangpur Cadet College, Bangladesh	2012
Dinajpur Board Scholarship, Bangladesh	2010

SERVICES

1. **TPC member**
IEEE WCNC, 2021
IEEE WCNC, 2022

2. **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

3. **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

4. Maintainer of an online paper repository on Age of Information, 2018-Present
See: http://webhome.auburn.edu/ yzs0078/AoI.html

5. Organizing Secretary, Bangladesh Student Organization, Auburn University, 2022
6. House Cultural Prefect, Rangpur Cadet College, Bangladesh, 2011-2012
7. Junior Prefect, Rangpur Cadet College, Bangladesh, 2011