Md Saydur Rahman

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Education

- **University of California, Riverside** — Riverside, CA
  PhD Candidate *in Electrical and Computer Engineering* — *Sep 2020 - June 2025*
  Supervisor: *Dr. Yingbo Hua*
- **University of California Riverside** — Riverside, USA
  M.S *in Electrical and Electronics Engineering;* — *Sep 2020 - Mar 2024*
- **Bangladesh University of Engineering and Technology** — Dhaka, Bangladesh
  B.Sc *in Electrical and Electronics Engineering;* — *Feb 2013 - Sep 2017*

Skills Summarys

- **Languages:** Python, MATLAB, C, R, Assembly, Verilog HDL.
- **Tools:** PyTorch, Scikit-learn, LTSPICE, MySQL, Docker, Quartus, AUTOCAD, INKSCAPE.
- **Embedded System:** Xilinx, EDA Playground, Micro-controller, Arduino, Proteus, FPGA
- **Research Area:** Deep Learning, Data Science, Wireless Security, UAV Communication, Domain Adaptaion

Research Projects

- **Security in Wiretap Channel**: "STEEP" enables secure message transmission in a MISO fading channel from Alice to Bob, even when Eve's channels are stronger; unifying principles in wiretap channel transmission and secret key generation.
- **UAV communication against Eavesdropping**: In the presence of strong jamming from a full-duplex eavesdropper we adopt a novel scheme "STEEP" which maintains a strong positive secrecy rate in bits per channel use in every channel coherence period.
- **SDoF Using Collaborative Pilots**: Secure Degree of Freedom of a multi-user multi antenna full-duplex wireless network with secret information transmission is presented using multi-user multi-antenna ANECE against Eve with any number of antennas.
- **Short Packet**: Effective secrecy throughput of information transmission has evaluated between two legitimate user against multi-antenna Eve under short packet communication where uRLLC and mMTC requirements satisfied.
- **ConvNext v2**: ConvNext V2 model, which incorporates elements of self-attention from transformers, significantly improves document image classification performance on the Tobacco-3482 dataset, achieving a 92.25% accuracy with fast convergence, and suggests that pre-training on ImageNet alone can be highly effective without additional domain-specific training.
- **Domain Adaptation**: Evaluating Source-free domain adaptation model in location based adaptive learning for weather forecasting, solar and wind power prediction across different regions.
- **Energy Theft Localization**: Utilizing statistical analysis of time-series voltage profiles of customers to detect electricity theft events in distribution networks.
- **Beat Based Realistic Video Generation**: Generating stick figure from audio beat extraction and using Pix2PixHD (GAN) image translation technique in a deep learning based multimodal model, realistic dance motion video is produced.

Employment

University of California, Riverside
Research Assistant — *Oct 2020 - Present*

University of California, Riverside
Teaching Assistant — *Oct 2021 - Dec 2022*

- **Courses and Lab Instruct**: Signal and System, Communication Theory, Digital Logic Design, Power Electronics.

Northern University Bangladesh
Lecturer — *May 2018 - Aug 2020*

- **Courses Instruct**: Signal and System, Programming Language, Control System, Electrical Circuits.

Professional Services

- **Reviewer:** Texas Power and Energy Conference, IEEE Transportation Electrification Conference & Expo, Applied Computational Intelligence and Soft Computing, IEEE Kansas Power and Energy Conference

Publication

- **MS Rahman**, and Y. Hua, "Secure UAV Communications By STEEP Against Full-Duplex Active Eavesdropper," accepted in *58th Asilomar Conference on Signals, Systems, and Computers,* Pacific Grove, CA, USA, 2024
- Y. Hua, and **MS Rahman**, "Unification of Secret Key Generation and Wiretap Channel Transmission," in *IEEE International Conference on Communications*, Denver, CO, USA, 2024
- Y. Hua, and **MS Rahman**, A. Swami, "A Method for Low-Latency Secure Multiple Access", in *IEEE International Symposium on Local and Metropolitan Area Networks (LANMAN)*, Boston, MA, USA, 2024
- Y. Hua, Q. Liang and **MS Rahman**, "Secure Degree of Freedom of Wireless Networks Using Collaborative Pilots," *IEEE Transactions on Signal Processing*, vol. 71, pp. 3755-3771, 2023.
- MSI Sajol, ASMJ Hasan, MS Islam, and **MS Rahman** 'Transforming Social Media Analysis: TweetEval Benchmarking with Advanced Transformer Models" in *IEEE ISMIT 2024*
- MSI Sajol, ASMJ Hasan, MS Islam, and **MS Rahman** 'A ConvNeXt V2 Approach to Document Image Analysis: Enhancing High-Accuracy Classification" in *IEEE CITDS* , Louisiana, USA, 2024.
- MS Islam, ASMJ Hasan, **MS Rahman**, J Yusuf, MSI Sajol and FA Tumpa "Location Agnostic Source-Free Domain Adaptive Learning to Predict Solar Power Generation" in *IEEE International Conference on Energy Technologies for Future Grids (ETFG)*, Wollongong, Australia, 2023, pp. 1-6.
- MSI Sajol, MS Islam, ASMJ Hasan, **MS Rahman**, and J Yusuf 'Wind Power Prediction across Different Locations using Deep Domain Adaptive Learning" in *IEEE GPECOM*, Budapest, Hungary, 2024.
- MSB Hossain, MS Islam, M S Haque, and **MS Rahman**, "Gait Phase Classification from sEMG in Multiple Locomotion mode Using Deep Learning", in *International Congress on Information and Communication Technology*, UK, 2024
- ASMJ Hasan, **MS Rahman**, MS Islam and J Yusuf, "Data Driven Energy Theft Localization in a Distribution Network" in *ICICT4SD*, 2023.
- ASMJ Hasan, J Yusuf, **MS Rahman** and MS Islam, "Electricity Cost Optimization for Large Loads through Energy Storage and Renewable Energy" in *ICICT4SD*, 2023.
- **MS Rahman**, MS Islam, M S Haque, FA Tumpa and AA Arabi "Location Agnostic Adaptive Rain Precipitation Prediction", *WIECON-ECE*, 2023
- **MS Rahman**, F A Tumpa, MS Islam and AA Arabi, "Comparative Evaluation of Weather Forecasting using Machine Learning Models", *ICCIT*, 2023
- M. S. Islam, **MS Rahman** and M. A. Amin, "Beat Based Realistic Dance Video Generation using Deep Learning," in *RAAICON*, 2019

Poster Presentation at DEVCOM

- UAV Communications By STEEP Against Full-Duplex Active Eavesdropper *at FNC3, Department of Defense-2024*
- Polar Coding Scheme for Wiretap Channel, *at FNC3, Department of Defense-2023*
- Overview of Secret Key Generation, *at FNC3, Department of Defense-2022*

Relevent Course

Wireless Communication, Information Theory, Deep learning, Stochastic Process, Digital Communication Theory, Convex Optimization, State and Parameter Estimation Theory, Channel Coding, Probability and Statistics

Awards

- Best Paper Awards, LANMAN 2024
- Dean's Distinguished Fellowship Award
- University Technical Scholarship
- University Stipend