Sabbir Ahmed

Website: sabbiracoustic1006.github.io
Email: sahmed9@binghamton.edu
LinkedIn | GitHub | Google Scholar
Phone: 9518239360

Research Interests

Deep Learning | Computer Vision | AI Efficiency | AI Security

Education

State University of New York (SUNY) Binghamton — Binghamton, New york
PhD in Computer Science — Jan 2023–Present
CGPA: 4.0/4.0

University of California Riverside (UCR) — Riverside, California
MS in Electrical Engineering — Sep 2021–Dec 2022
CGPA: 3.96/4.0

Bangladesh University of Engineering and Technology (BUET) — Dhaka, Bangladesh
B.Sc. in Electrical and Electronic Engineering — Feb 2015–Apr 2019
Major: Communication and Signal Processing

Work Experience

SONY AI — Binghamton, New York (Remote)
Research Intern, Efficient Vision Foundation Model — Aug 2024–Current

SUNY Binghamton — Binghamton, New York
Graduate Research Assistant, ML Security Lab — Jan 2023–Current

REVE Systems — Dhaka, Bangladesh
Machine Learning Engineer — Feb 2020–Aug 2021

Research Experience

Developed Novel ViT Compression Method — Jan 2024–Present
Supervisor: Dr. Adnan Siraj Rakin

- Developed novel algorithm for extreme ViT compression ($15-20\times$) with high performance.
- Developed novel strategy to minimize inference time on edge devices.

Improving Security, and Efficiency of Unsupervised Learning Algorithms — Jan 2023–Current
Supervisor: Dr. Adnan Siraj Rakin

- Developed Secure Source-Free Domain Adaptation (SSDA), an efficient defense mechanism for unsupervised learning, reducing computational overhead while mitigating backdoor attacks.
- Developed efficient method to improve generalization in unsupervised federated learning.

Developed New Inference Stage Algorithm for Attacking DNNs — Jan 2023–Current
Supervisor: Dr. Adnan Siraj Rakin

- Developed Deep-TROJ, an efficient weight-replacement attack that injects trojans into DNNs by leveraging memory manipulation techniques.
- Demonstrated Deep-TROJ as the most efficient attack algorithm to date for large-scale Vision models, requiring the fewest iterations.

Significant Publications

1. **Sabbir Ahmed**, Abdullah Al Arafat, Deniz Najafi, Akhlak Mahmood, Mamshad Nayeem Rizve, Mohaiminul Al Nahian, Ranyang Zhou, Shaahin Angizi, Adnan Siraj Rakin, "DeepCompress-ViT: Rethinking Model Compression to Enhance Efficiency of Vision Transformers at the Edge" (accepted at CVPR 2025).

2. **Sabbir Ahmed**, Mamshad Nayeem Rizvee, Abdullah Al Arafat, Jacqueline Liu, Rahim Hossain, Mohaiminul Al Nahian, Adnan Siraj Rakin, "Unified Alignment Protocol for Generalized Semi-Supervised Federated Learning" (submitted at ICCV 2023).

3. **Sabbir Ahmed**, Ranyang Zhou, Shaahin Angizi, Adnan Siraj Rakin, "Deep-TROJ: An Inference Stage Trojan Insertion Algorithm through Efficient Weight Replacement Attack", 2024 Computer Vision and Pattern Recognition (CVPR 2024).

4. **Sabbir Ahmed**, Abdullah Al Arafat, Mamshad Nayeem Rizvee, Rahim Hossain, Zishan Guo, Adnan Siraj Rakin, "SSDA: Secure Source-Free Domain Adaptation", 2023 International Conference of Computer Vision (ICCV 2023).

5. **Sabbir Ahmed**, Uday Kamal, Md. Kamrul Hasan, "DFR-TSD: A Deep Learning Based Framework for Robust Traffic Sign Detection Under Challenging Weather Conditions", IEEE Transactions on Intelligent Transportation Systems.

Skills

- **Programming Languages:** Python, MATLAB, C, C++, Intel-8086 Assembly
- **Simulation & Design Tools:** PSpice, Simulink, AutoCAD, Verilog
- **Machine Learning Libraries:** PyTorch, Tensorflow, Keras, Scikit-Learn

Relevant Graduate Course-works

Machine Learning | Deep Learning | Reinforcement Learning | Design and Analysis of Algorithm

Awards and Honors

- **Ebay 2024 University ML Competition**, Team leader of team *"Bing NeuraNest Returns"* that won 2nd runner up position.
- **Ebay 2023 University ML Competition**, Team leader of team *"Bing NeuraNest"* that won 2nd runner up position.
- **Clog Loss: Advance Alzheimer's Research with Stall Catchers**, Team leader of team *"acoustic_user"* that won 6th place among 922 teams from the whole world.
- **Bengali Handwritten Digit Recognition Competition**, Won $5th$ position among 57 teams from the whole country.
- **Kaggle APTOS 2019 Blindness Detection**, Team leader of team *"cholo model re shikhai"* that won 38th place among $2,943$ teams from the whole world.
- **Kaggle Human Protein Atlas Image Classification**, Member of team *"The Unseens"* that won $98th$ place among $2,169$ teams from the whole world.
- **IEEE Signal Processing Cup 2019**, Member of team *"Maverick"* that won $6th$ place among 24 teams from the whole world.
- **Serving as Reviewer**, at CVPR 2025 and ICCV 2025.