

IBRAHIM MOHAMMED SAYEM

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RESEARCH INTEREST

My research broadly focuses on the intersection of machine learning with Security and Privacy, particularly in areas such as Data Privacy and Security, System and Software Security, and ML Security and Trustworthiness. I applied ML to Security Problems in the network & Software domain and used Statistical & Deep Sequence models for 5G QoS analysis.

EDUCATION

University of Western Ontario

M.Sc in Computer Science (Thesis-based), GPA: 4.00 out of 4.00

January 2021 – December 2022

London, Ontario, Canada

University of Chittagong

B.Sc in Computer Science and Engineering, CGPA: 3.60 out of 4.00

January 2013 – October 2018

Chittagong, Bangladesh

RESEARCH EXPERIENCE

University of Western Ontario

Graduate Research Assistant

January 2021 – August 2022

London, Ontario, Canada

Worked in AI-based cyber-security and 5G traffic forecasting projects in the WING LAB lead by Dr. Anwar Haque.

- **WING5GQoS** : 5G QoS Data Collection and Forecasting Tool [under embargo] (*5G, QoS, Time-series Forecasting*)

We partnered with Bell Canada to develop WING5GQoS, a 5G QoS data collection and forecasting tool. Using a file-sharing strategy, we gathered key QoS metrics and applied data windowing to forecast throughput and latency with 87.89% accuracy. Deep models like LSTM and LSTM encoder-decoder were used to optimize resource utilization.

- **ENIDS** : Ensemble Network Intrusion Detection System (*Security, Deep Learning, Ensemble Approach*)

We utilized two network traffic datasets, applied optimal feature selection, and addressed class imbalance using SMOTE+ENN. We proposed an ensemble model with CNN, LSTM, and GRU in the first layer, followed by a DNN, achieving 90.4% and 99.6% accuracy on UNSW-15 and CICIDS-2017 datasets, respectively, while reducing attack detection time by 30%.

University of Chittagong

Undergrad Research Assistant

June 2017 – October 2020

Chittagong, Bangladesh

- Developed IoT-based Security Camera and ML-based Credit Card Fraud Detection

PUBLICATIONS

- Advancing Software Security and Reliability in Cloud Platforms through AI-based Anomaly Detection, **ACM CCSW, CR: A1**, 2024. [Accepted]
- ENIDS: A DL-Based Ensemble Framework for Network Intrusion Detection System, **IEEE TNSM, IF: 5.3**, 2024.
- WING5GQoS: QoS Performance Analyzer Tool and Pattern Prediction Using AI, **currently embargo**, 2024.
- Exploring Artificial Intelligence (AI) Techniques for Forecasting Network Traffic: Network QoS and Security Perspectives, **Master's Thesis**, 2022.
- A Multi-Classifer for DDoS Attacks Using Stacking Ensemble Techniques, **IEEE IWCMC, CR: A2**, 2022.
- Analysis of machine learning techniques for credit card fraud detection, **Google Scholar**, 2019.
- Integrating Face Recognition Security System with the Internet of Things, **Google Scholar**, 2018.

TECHNICAL SKILLS

- **Languages**: Python, Java, C/C++, JavaScript
- **Databases**: SQL, MySQL, PostgreSQL, MongoDB
- **DS and ML Tools**: Pandas, Numpy, Tensorflow, Scikit-Learn/Image, OpenCV, NLTK, spaCy, PyTorch, PIL
- **Tools**: Git, Docker, AWS, BitBucket, Azure, GCP, Terraform, CI/CD.

TEACHING EXPERIENCE

Humber College

Instructor

January 2024 – Present

Toronto, Ontario, Canada

- Teaching a variety of courses, such as Web Programming, Network Programming, Data Structures, and Application Development (.NET). Provided student mentorship and support in course projects and experiments, as well as designed and delivered lectures, assignments, and exams.

Seneca Polytechnic

Adjunct Professor

May 2023 – December 2023

Toronto, Ontario, Canada

- Designed and implemented course curriculum, assignments, and assessments. Delivered lectures, seminars, and labs on subjects such as OOP, Data Structures, Computer Networks, and Information Security.

University of Western Ontario

Graduate Teaching Assistant

January 2021 – December 2022

London, Ontario, Canada

- Performed TA duties for undergraduate Computer Science courses like Data Structures and Computer Networks. Assist professors in delivering lectures and conducting lab sessions. Graded assignments and exams with constructive feedback.

International Islamic University, Chittagong

Adjunct Faculty

November 2018 – December 2020

Chittagong, Bangladesh

- Developed and implemented course curriculum and conducted classes and labs on structured programming languages, Computer Networks, data structures and algorithms, compiler design, and computer simulation.

PROFESSIONAL EXPERIENCE

Community of Guardians

Full Stack Developer(Full-time)

April 2023 – December 2023

London, ON


- **Responsibilities:** Ensured a robust user experience and seamless user experience by developing and maintaining web applications using front-end and back-end technologies. Collaborated with cross-functional teams to develop, execute, and optimize scalable solutions.
- **Tech stack:** Node.js, Express.js, React.js, HTML, PostgreSQL, Tailwind, CI/CD, Jira, GitHub

Rankmylist Bangladesh Ltd.

Web and Mobile Application Developer

Dec 2018 – April 2020

Chittagong, Bangladesh

- **Interactive Ranking Module:** Created a core ranking module for rankmylist  Optimized MySQL queries, contributed to the design of the system for efficient data storage, and developed a ranking module and automated data visualization using D3.js.
- **Tech stack:** Vanilla JavaScript, PHP, d3.js, MySQL, CSS, HTML, Python, BitBucket.

PROJECTS

Currently working on Cloud and Software Security Projects, and exploring the Trustworthiness of Gen AI along with its Safety and Security.

ACCOMPLISHMENTS and AWARDS

- Secured the third position in UWORCS 2022 for the Traffic Forecasting project.
- WGRS(Western Graduate Research Scholarship); awarded by Western University, for research.

REFERENCES

Available Upon Request