Ibrahim Mohammed Sayem

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INTEREST

Machine learning for data analytics and predictive analytics, ML techniques for Network QOS, analyzing optimization and generalization in deep learning, deep learning, and statistical approach for time series problems, natural language processing, Intelligent Information Security, and Network Security for cyberattack detection and prevention.

EDUCATION

University of Western Ontario ***January 2021 – December 2022***
M.Sc in Computer Science (Thesis-based), GPA: 4.00 out of 4.00 *London, Ontario, Canada*

University of Chittagong ***January 2013 – October 2018***
B.Sc in Computer Science and Engineering, CGPA: 3.60 out of 4.00 *Chittagong, Bangladesh*

RESEARCH EXPERIENCE

University of Western Ontario **January 2021 – August 2022**
Graduate Research Assistant *London, Ontario, Canada*

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

- **5G networks Quality of Service (QoS)** : Collected 5G networks data and predicted the QoS *(5G, QoS Forecasting)*
  Quality of Service (QoS) in 5G networks : Worked closely with the **Bell Canada** technical team in developing a 5G QoS forecasting tool, employed a file-sharing strategy in varying traffic loads to collect data utilizing a high-speed server and **proposed a dataset with four different QoS metrics of the 5G network.** The collected data was pre-processed, **transformed using the data windowing technique**, and **forecasted throughput for three different day parts with 87.89% accuracy** using various deep sequences models, such as LSTM and LSTM encoder-decoder, **resolving resource utilization issues. This project is part of the Bell-Western 5G research program.**
- **AI-based Network IDS** : Our AI model can detect different kinds of cyberattack *(deep learning, ensemble technique)*
  AI-based Network IDS : Used two popular network traffic datasets, extensively pre-processed the data with optimal feature selection, and solved the **imbalance classification problems using the data resampling technique SMOTE + ENN.** Proposed an **Ensemble model** where CNN, LSTM, and GRU were used in the first layer, and the **training weights of the first layer were concatenated with DNN in the second layer**, which can detect 11 different types of cyberattacks with **improved accuracy of 90.4% and 99.6% for the UNSW-15 and CICIDS-2017 datasets and reduce attack detection time by 30%.**

University of Chittagong **June 2017 – October 2020**
Undergrad Research Assistant *Chittagong, Bangladesh*

- **IoT based Security Camera** : Detects unauthorized access from real-time video streaming *(Python, OpenCV, Raspberry pi)*

  Used **Image pre-processing, Face Detection, Feature Extraction** and train classifier model and used **LBPH** object classifier to detect real-time face from live stream video and used **Machine-Learning** to predict the image and if the image is not in the authorized list the system will send an email notification.

TEACHING EXPERIENCE

Humber College **January 2024 – Present**
Partial-load Professor *Toronto, Ontario, Canada*

- CPAN-133-Operating system, Fall 2024
- ITE-5231-Data Structure and Design Patterns, Fall/Winter 2024
- CPAN-212-Modern Web Technologies, Winter 2024
- CPAN-226-Network Programming, Fall/Winter 2024

- CPAN-134-Web Programming and Design, Winter 2024

Seneca Polytechnic **May 2023 – December 2023**
Adjunct Professor *Toronto, Ontario, Canada*

- BTP100-Programming Fundamentals Using C, Summer 2023
- BTD315-Advanced Database Technologies, Summer 2023
- DSA456-Data Structure and Algorithms, Fall 2023
- BTN710-Information Security, Fall 2023

University of Western Ontario **January 2021 – December 2022**
Graduate Teaching Assistant *London, Ontario, Canada*

- COMPSCI-1027B Computer Science Fundamentals II, Winter 2021
- COMPSCI-2210B Data Structures and Algorithms, Fall 2021
- COMPSCI-1027B Computer Science Fundamentals II, Winter 2022
- COMPSCI-4457A Computer Networks II, Fall 2022

International Islamic University, Chittagong **November 2018 – December 2020**
Adjunct Faculty *Chittagong, Bangladesh*

- CSE-4827 Computer Simulation and Modeling, Spring 2018
- CSE-3527 Compiler Design, Autumn 2019
- CSE-3637 & CSE-3638 Software Engineering and Lab, Autumn 2019
- CSE-4832 Computer Networks I, Spring 2019
- CSE-2423 & CSE-2424 Database Management system and Lab, Spring 2019
- CSE-2321 Data Structure and Algorithms, Spring 2020
- CSE-3631 Operating Systems, Autumn 2020

PROFESSIONAL EXPERIENCE

Community of Guardians **April 2023 – December 2023**
Full Stack Developer(Full-time) *London, ON*

- **Responsibilities:** Manage IT operations to ensure the best functionality and alignment with company strategy. To improve IT practices and operations, develop and implement policies and procedures. Find and solve technology-related risks, problems, and opportunities; put good solutions in place. Develop partnerships with vendors, oversee IT budgets, enhance system performance, and guarantee legal compliance.
- **Tech stack:** Node.js, Express.js, React.js, HTML, PostgreSQL, Tailwind, CI/CD, Jira, GitHub

Rankmylist Bangladesh Ltd. **Dec 2018 – April 2020**
Web and Mobile Application Developer *Chittagong, Bangladesh*

- **Interactive Ranking Module:** Created a core ranking module for rankmylist website and Created automated data visualization charts to draw insights from submitted rankings based on **interactive visualization using d3.js**. **utilized MySQL and improved database query performance through proper indexing**. provided various levels of customer support for database entry and manipulation queries. Contributed to system design planning, providing insights regarding efficient data storage.
- **Tech stack:** Vanilla JavaScript, PHP, d3.js, MySQL, CSS, HTML, Python, BitBucket.

PUBLICATIONS

- Integrating Face Recognition Security System with the Internet of Things, **Google Scholar**, 2018.
- Analysis of machine learning techniques for credit card fraud detection, **Google Scholar**, 2019.
- A Multi-Classifier for DDoS Attacks Using Stacking Ensemble Deep Neural Network, **Google Scholar**, 2022.
- ENIDS: A Deep Learning Based Ensemble Framework for Network Intrusion Detection System, **IEEE TNSM, Accepted**, 2024.
- WING5GQoS: QoS Performance Analyzer Tool and Pattern Prediction Using Artificial Intelligence (AI), **Computer Networks, Elsevier, Submitted**, 2024.

PROJECTS

- **Illegally parked vehicle detection** : Detects illegally parked vehicles from real-time video Streaming *(Python, OpenCV)*Used **background subtraction, shadow, noise removal, centroid techniques** to extract static objects from videos and applied **Haar-cascade** object classifier to detect real-time illegally parked vehicles. Used, CNN, MRCNN, and LSTM Algorithms for the Model Development
- **Phone Book Manager(Andriod Project)** : Add number, email, location, along with image *(Java and SQLite)*
- **University Hall Management System** : Managing Hall which helps students and authority to save the records of the students
  about their rooms and other things. *(PHP, HTML, JavaScript, MySQL and CSS)*
- **Discussion Forum** : A Forum that allows all the members of the Organization to hold discussions online. *(Laravel)*

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.
- Productive employee award from Rankmylist Inc.
- NST Fellowship (2018); Awarded by the Ministry of Science and Technology, Government of Bangladesh, for undergrad thesis.
- Merit Based Government Scholarship (2018) for being the top 5 students in bachelor studies from the Department of Computer Science at the University of Chittagong.

TECHNICAL SKILLS

- **Languages**: **Python**, **Java**, C/C++, **JavaScript**, C#
- **Frameworks**: **Node.js**, Express.js, **React.js**, Next.js, Django, d3.js
- **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, JIRA, GCP, Terraform, BigQuery, CI/CD, ETL, Airflow.
- **Deployments Tools**: NginX, Apache, Ansible, Docker, Jenkins, Linux

LEADERSHIP and ATTRIBUTES

- Team member for the Organizing Committee of UWORCS 2021
- Volunteer of the Bit by bit summer camp arranged for young students to teach idea and skills of IT
- Problem-Solving, Attention to Detail, Teamwork and collaboration, Time Management, Analytical Thinking, Continuous Learning, Adaptability, and Documentation.
- Organizing member of the Golden Jubilee celebration of the University of Chittagong in 2015.
- Organized CU Inter-University programming contest in 2016.

CERTIFICATIONS

- CISCO Networking Academy: Introduction to CyberSecurity.
- ML Observability Fundamentals Certification.
- Databases and SQL for Data Science with Python.
- Google Data Analytics Professional Certificate.
- NLP with Python for Machine Learning Essential Training.
- Fundamentals of Scalable Data Science.

REFERENCES

Available Upon Request