S MAHMUDUL HASAN

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EDUCATION

M.Sc. in Computer Science, Syracuse University, Syracuse, NY, USA 09/2021 – 05/2024
GPA: 4.00/4.00 | Awarded the esteemed "University Fellowship" for two consecutive years.

B.Sc. in Computer Science, Bangladesh University of Eng. and Tech., Dhaka, Bangladesh 05/2014 – 10/2018
GPA: 3.65/4.00 | Earned the prestigious "Dean's List" award for two semesters.

CERTIFICATIONS

AWS Certified Developer - Associate (Expires Feb 2027) Validation Number: f1818f2049334419975f6f21ca60fd51
AWS Certified Machine Learning - Specialty (Expires Feb 2027) Validation Number: ecd6f1e093da46d4bf20f4d864fa741d

WORK EXPERIENCE

Syracuse University, Syracuse, New York | Graduate Research Assistant 09/2021 – 01/2024

- Integrated Helion – an **ML-based** sequence generator for **home automation** scenarios with VetIoT – a platform for testing home automation defenses. Built a system for translating events between Helion and VetIoT using **Python, JSON**, and DSLs.
- Created an adaptable **fuzzing framework** to assess 12 fuzzers using **C/C++, Python, and Docker**. Evaluated the fuzzer-generated input quality for 13 **cryptographic libraries** and found that only about 30% of generated inputs are valid for complex structures.
- Enhanced LineageOS (and **Android Open Source Project**) by introducing QR code-based bootstrapping for enterprise Wi-Fi connections (SeQR) and assessed the system's performance using a customized **Android NDK application** and Censys dataset, confirming its flawless functionality in every instance, achieving a **100% success** rate.
- Implemented a web application powered by **Firebase** as the backend and **Flutter** as the frontend for conducting surveys for SeQR. Surveyed 1200+ participants on **Amazon Mechanical Turk** in multiple phases and examined the responses using **Pandas, Scipy, Scikit-Learn, Matplotlib**, and other data analysis and visualization tools to showcase the utility of SeQR.
- Developed a **Python application** for creating NuSMV models from system descriptions written in a domain-specific language.

PocketPy, pocketpy.dev | Open Source Contributor 09/2023 – Present

- Enhanced Python's "str.format" method to provide previously unavailable functionality. Performance improved by 40%.
- Implemented an efficient "**deque**" data structure in **C++** using a doubly linked list which resulted in 80% performance improvement.

Eastern University, Dhaka, Bangladesh | Faculty Lecturer 02/2020 – 08/2021

- Instructed courses on **C/C++ programming, Algorithms, and Compilers** as well as supervised student projects receiving about 87% positive feedback on average.
- Mentored over 20 students for programming contests and organized intra-university **programming contests**.

Canadian University of Bangladesh, Dhaka, Bangladesh | Faculty Lecturer 02/2019 – 09/2019

- Instructed theoretical and hands-on courses on **Android programming, Compilers, Computer Networks, and Algorithms** receiving 84% positive feedback on average.
- Developed and taught a course for 60 students which achieved a 93% satisfaction rating in 3 months.

Reve Systems, Dhaka, Bangladesh | Software Engineering Intern 04/2018 – 06/2018

- Developed a system for Bengali Speech-To-Text and Text-To-Speech data collection and labeling using **Java** that helped annotate 2000+ data points seamlessly.

PERSONAL AND ACADEMIC PROJECTS

Evaluation of Statistical Modeling for Fake News Detection

- Led a team of 3 to evaluate classical machine learning models for Fake News Detection while exploring the use of embeddings.
- Devised a feature engineering framework using the CFS method, enabling the classical models to achieve performance on par with cutting-edge Deep Learning models (about 28% accuracy on multi-class classification, SOTA is about 30%).

The Cloud Resume Challenge

- Designed and implemented a serverless architecture utilizing **AWS Lambda, API Gateway, S3, DynamoDB, and SAM** Templates.
- Developed a dynamic and responsive web application using **Jekyll** to showcase professional experience, skills, and projects.
- Automated deployment processes with **GitHub Actions** for efficient and scalable infrastructure management.

SelfSync – Self Management Application

- Developed SelfSync, a dynamic self-management app using **Flutter** for the front end.
- Integrated a range of features including **notes, to-do lists, trip planning, step tracking**, and **reminders**.
- Engineered backend services using **AWS Amplify's** serverless architecture with **AWS API Gateway, DynamoDB, and Lambda**.
- Implemented **email-based and social authentication** using the **Amplify Authenticator library** for seamless user sign-in and sign-up.

SKILLS

Programming Languages: Python (10k+ loc) | TypeScript (~5k loc) | C/C++(10k+ loc) | Java (~8k loc) | JavaScript | HTML | CSS;
Frameworks, Databases, Data Analysis, and ML Tools: Angular | Android Native | Git | Docker | Flask | Firebase | Flutter | Linux | MongoDB | Amazon Web Services: SAM, S3, Lambda, ApiGateway, DynamoDB | iOS Development: SwiftUI, StoryBoard;
Soft Skills: Technical Presentation | Technical Writing | Collaboration | Teaching;