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 — Validation Number: f1818f2049334419975f6f21ca60fd51
AWS Certified Machine Learning - Specialty — Validation Number: ecd6f1e093da46d4bf20f4d864fa741d

WORK EXPERIENCE

Syracuse University, Syracuse, New York|Graduate Research Assistant — 09/2021 – Present

➢ Integrated the Helion **ML**-based sequence generator with containerized home automation platform, **VetIoT**, using Python translation system; developed a small **Python** GUI **using PyQT5** for accelerating manual translation; extensively documented the project.

➢ Created a scalable and configurable containerized **fuzzing framework** to assess 12 fuzzers using **C/C++, Python, and Docker**.

○ Evaluated fuzzer-generated input quality for **13 C/C++ cryptographic** libraries, finding only 30% valid for complex structures, automated build/execution of fuzzer harnesses using **Bash** scripting on a **Linux** server, and utilized **Tkinter, the Python interface to Tcl/Tk**, for simple monitoring of the fuzzing campaigns. Created extensive **documentation** for utilizing the newly created platform.

➢ Collaborated with a multidisciplinary team on **UX Design, fuzzing and IoT-security** projects, utilizing **GitHub/Git** for version control and effective communication to integrate individual contributions and foster innovation.

➢ Introduced QR code-based Wi-Fi bootstrapping (SeQR) and Radius Server certificate validation in the open-source Android distribution LineageOS by modifying system-level **Java** and **C/C++** code, including the **Android framework** and the **wpa_supplicant** component.

○ Evaluated the performance of the developed system using a custom **Android NDK** application on a large dataset of SSL certificates.

○ Developed a cross-platform survey web app using **Firebase** backend services (**Realtime Database, Storage**) and **Flutter** front-end, with **Drift/SQLite** for local data storage and Firebase **Realtime Database** for persisting survey data.

○ Surveyed 1,200 participants on Amazon Mechanical Turk, analyzing responses using **Python, Pandas, SciPy, Scikit-Learn, Matplotlib** to showcase the utility of the newly developed **UX** mechanism.

➢ Designed and implemented a serverless cloud infrastructure for hosting static sites using **AWS Lambda, API Gateway, S3, DynamoDB, and SAM** Templates.

○ Constructed a responsive web application using **Jekyll, HTML, CSS, and JavaScript** to showcase experience, skills, and projects.

○ Automated continuous deployment (CI/CD) using **GitHub Actions** for infrastructure management.

➢ Developed a partial clone of TMDB using a **Java Spring Boot** RESTful API and **MongoDB Atlas** database, implemented the front-end UI with **React** and **Bootstrap**, and deployed the system on an **AWS ECS** cluster to test its stability and scalability.

➢ Designed, **SelfSync,** an application for creating notes, to-do lists, trip planning, step tracking, and reminders, using the **Flutter** framework for **cross-platform** mobile and web development, while employing **Test-Driven Development** (TDD) approach and writing unit tests.

○ Utilized a combination of the **Drift** ORM and **SQLite** database for efficient and type-safe local data storage on the user's device.

○ Developed **microservices**-based **REST APIs** using **AWS Amplify's** serverless architecture, with **AWS API Gateway**, **DynamoDB**, and **Lambda** functions powering the backend. Added **email-based and social authentication** using the **Amplify Authenticator** library for seamless user sign-in and sign-up.

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

➢ Enhanced Python's **String format()** method to provide previously unavailable functionality. Performance improved by about 40%.

➢ Implemented an efficient "**deque**" data structure in **C++** using a doubly linked list which resulted in 80% performance improvement.

➢ Added comprehensive test suites containing about **100 unit tests** to test both of the implemented functionalities.

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

➢ Conducted courses in **C/C++ programming, Algorithms, and Compilers**, while also **supervising** student projects and **mentoring** over 20 students for programming contests and organized intra-university **programming contests**.

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

➢ Delivered theoretical and practical courses in **Android programming, Compilers, Computer Networks, and Algorithms**.

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

➢ Developed a system for Bengali speech data labeling using **Java Spring Boot** that helped annotate 2000 data points seamlessly.

PUBLICATIONS

1. **SeQR: A Foolproof Configurator for Enterprise Wi-Fi** (In Submission: Mobicom 2024)
2. **Evaluating Fuzzers using Context Sensitive Inputs** (In Submission: USENIX ATC 2024)
3. **Automated Evaluation of Policy Enforcing IoT Defenses** (In Submission: Transactions on Embedded Computing Systems 2024)
4. **Revealing Influences of Socioeconomic Factors over Disease Outbreaks** (Published in ACM Compass 2022)

SKILLS

Programming Languages: Python (10k+ loc) | C/C++(10k+ loc)| Java (10k+ loc)|Bash | TypeScript;
Additional Skills: Flask|Amazon Web Services | iOS Development (SwiftUI) | MongoDB | MySQL;
Soft Skills: Technical Presentation|Technical Writing|Collaboration|Teaching|Problem Solving;