Ujaan Das

ujaandas03@gmail.com linkedin.com/in/ujaandas github.com/ujaandas

Education

Hong Kong University of Science and Technology — Hong Kong SAR
Bachelor of Engineering in Computer Engineering — *Sep. 2021 – May 2025*

Northwestern University — Evanston, Illinois
Exchange Semester — *Jan. 2024 – Apr. 2024*

Experience

Undergraduate Research Assistant — Sep. 2023 – Present
HKUST, Dept. of CSE | *Python, Java, Tensorflow 2, tf-seq2seq* — *Hong Kong SAR*

- Entrusted with enhancing test-case generation for large Java projects to improve multi-shot automated testing accuracy, and thus needed to research and implement efficient data extraction and testing methodologies.
- Developed a GitHub project scraper, mining over 29,000 repositories to extract data from 'pom.xml' files and recreated neural machine translation approaches using RNN encoder-decoder models to train on relevant Junit4 test classes. Employed static analysis tools like SPOON to generate tests, implementing a filtering mechanism post-compilation.
- Overall, improved test case generation precision by 33% compared to existing methods (seq-2seq based machine translation approaches), and significantly reduced the time required for test generation and execution.

Software Engineering Intern — Apr. 2024 – Sep. 2024
Stellerus Technology | *C#, ASP.NET Core, PostgreSQL, RabbitMQ, AWS* — *Hong Kong SAR*

- Responsible for delivering a backend service to provide real-time geospatial services from live satellite data, capable of handling over 10,000 requests per day, as well as optimized worker processes to handle concurrent geometry calculations.
- Developed the service using ASP.NET Core and Amazon RDS (PostgreSQL) for CRUD tasks and authentication. Implemented AWS Lambda and Amazon MQ (RabbitMQ) for multiprocessing and task queues, utilizing multiple Kestrel workers to handle CPU-intensive tasks efficiently.
- Designed a distributed caching system with Redis using a Cache-Aside pattern to enhance data retrieval speed and reduce database load by efficiently managing frequently accessed data.
- Ultimately achieved a 74% increase in (concurrent) task completion time (compared to prev.), reduced database query load by 60% (via Performance Insights), and significantly improved front-end response times.

Projects

oojlang | *Racket/PLAI, gc2* — Feb. 2024

- Developed a custom functional programming language using Racket to explore advanced language concepts.
- Implemented manual parsing, interpretation, and compilation with constant folding. Designed a two-space copying garbage collector to manage memory efficiently. Utilized deferred substitution for managing state and continuations, handling namespace lookups, recursion, and exceptions.
- Successfully created a robust language capable of handling complex computations without memory leaks or allocation errors, even given infinitely running programs.

Farm-2-Flight | *Python, Scikit-Learn, React.js* — Oct. 2023

- Participated in Cathay Hackathon 2023 to develop a recommendation engine for optimizing delivery routes.
- Built a machine-learning hybrid-recommendation engine using collaborative and content-based filtering. Deployed it on FastAPI, integrating with a React.js frontend and Cathay flight API for real-time route optimization.
- Achieved finalist status among 64 teams and won the 'Best in Lifestyle' category, demonstrating innovation and practical application.

Technical Skills

Languages: C#, Java, Python, SQL, C/C++, JavaScript (ES5/ES6), Typescript, HTML/CSS
Frameworks: ASP.NET Core, Maven, FastAPI, Next.js, React.js, Node.js
Technologies: Linux, Azure, AWS, Docker, PostgreSQL, MongoDB, MySQL, Git