ASIF IQBAL RAHAMAN

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SKILLS

Programming: Python, Rust, Javascript, Typescript, C++, Java, GoLang, SQL, Bash, Shell, C#, .NET, HTML, CSS, ReactJS, React Native (Expo)
Frameworks: FastAPI, Flask, RestAPI, Pandas, Numpy, AWS-CDK, PyTorch, Apache Spark, Seaborn, Scikit-learn, Pillow, OpenCV, Django, PyAutoGUI, Selenium
Tools: Docker, Git, Jenkins, Unix, Nginx, Supervisor, MySQL, MongoDB, SQLAlchemy, SQLite, AWS, Azure, GCP, Kubernetes, Terraform, GitHub Actions

EDUCATION

Virginia Polytechnic Institute & State University (Virginia Tech) — Blacksburg, US — Aug 2022 — May 2024
Master of Engineering in Computer Science and Applications — **CGPA: 3.9/ 4.0**

- **Courses**: AI Tools for Software Development, Natural Language Processing, Data Analytics, Information Visualization, Machine Learning, Computer Vision
- **Research Assistant** for over 2 years, resulting in a research publication in the peer-reviewed journal **PLOS One**.

Vellore Institute of Technology (VIT University) — Vellore, IN — Aug 2015 — May 2019
Bachelor of Technology in Computer Science — **CGPA: 8.0/ 10.0**

- **Courses**: Data Structure and Algorithm, Network Architecture, IoT, Data Mining, Cyber Security, Artificial Intelligence, Database Management System

EXPERIENCE

Department of Computational System Biology, Virginia Tech — Oct 2022 — Present
Student Software Developer/ Research Assistant — **Blacksburg, US**

- Pioneered a **novel algorithm** to simulate the cell cycle with Boolean model of protein interaction and scoring the models along with their perturbations.
- Achieved over **5 times** efficiency and accuracy gain by leveraging parallel processing and algorithm optimization on **ARC high performance compute cluster** at Virginia Tech for an exponentially growing protein interaction graph perturbation model that reached size of over **1.6 million** during each cycle.
- Devised a comprehensive approach for **data validation** using protein interaction data fetched from **SIGNOR 3.0** using **third party database APIs**.
- Used Python libraries like pandas, numpy for **data manipulation**; networkx, seaborn for **graph visualization**; and dataclass for **input modelling**.
- Culminated in a publication in the peer-reviewed **PLOS One journal** available at journals.plos.org/plosone/article?id=10.1371/journal.pone.0306523.

Skills/ Tech stack: Python, Pandas, Numpy, Simulation, Algorithm Design, Optimization, Parallel Processing, 3rd party APIs, Database, Data Manipulation

Seclore Technologies Pvt. Ltd. — Dec 2021 — Jul 2022
Product Engineer — **Mumbai, IN**

- Conceived a **DevOps automation** strategy that reduced customer onboarding time from **5 days to 4 hours**, achieving over **10 times** performance gain.
- Integrated various **AWS** services like **CloudFormation, DynamoDB, RDS, ECS, EC2, ECR, CloudWatch** using **AWS-CDK** to onboard new customers in private cloud with customizable infrastructure stack, that is currently being used by the DevOps team at the organization for faster onboarding.
- Designed a robust **CI/CD pipeline** and **infrastructure-as-code** using **Docker and Jenkins** that increased customer deployment efficiency by over 500%.
- Employed **test-driven development** with complete **end-to-end test, integration test and unit test** using **PyTest**, and maintained a **version-control system**.
- Collaborated effectively in an Agile environment, delivering the initial framework in 4 months utilizing **CI/CD principles** and **version control** in a team of 3.

Skills/ Tech stack: Python, AWS-CDK, Docker, Jenkins, PyTest, Redis, Java, Active Directory, Amazon Web Services, Terraform, IaC, CI/CD, Cloud, Agile

Ericsson Global India Services Pvt. Ltd. — Jan 2019 — Jul 2021
Software Developer — **Bangalore, IN**

- Developed a **custom RPA framework** that is used by network engineers to automate maintenance tasks in virtual environment with gain of over **35%**.
- Designed the backend for the RPA framework with **Flask** and **MongoDB** to support **remote execution** without direct interaction with GUI elements, used **OpenCV**, **Pillow** to identify actionable items on screen, and used **RestAPI** with **blob storage** to store logs with screengrabs to automate failure detection.
- Migrated to Hashicorp vault for encryption key storage along with open-source PerconaDB as an alternative to MySQL 8 to meet security and audit standards, keeping **data-at-rest** as well as **data-in-transit** encrypted. Set up **TLS protocol** along with **access management** to achieve the desired results.
- Integrated the RPA framework with Ericsson's **automation hosting platform** BotStore, streamlining the process and boosting adoption by over **50%**.
- Built a **rule-based recommendation engine** to calculate the **worst performing cells** in a network according to **KPIs** given by the network engineers.
- Experimented with methods to replace the rule-based system with a machine learning framework using **historical cell performance data** with **TensorFlow**.
- Developed an **ETL pipeline** with **RestAPI** using **requests** and **flask** to efficiently process and fetch data with over **1B rows and 30K columns** from datalakes of network providers using their **third-party APIs**; clean, categorize, sort and store them in **parquet** format in SQL database using **pandas**, **numpy**.
- Processed large data in parallel on the **Linux server**, triggered daily with execution pipeline built with **Apache Airflow** and **cronjob**.

Skills/ Tech stack: Python, Selenium, PyAutoGUI, SQL, NoSQL, MongoDB, Data Analysis, Image Recognition, Encryption, Apache Spark, Optimization

PROJECTS

Dynamic Personal Website using FastAPI and SQLAlchemy ORM — Jul 2023

- Embraced hands-on learning approach for front-end by designing a dynamic website using **FastAPI** with **Jinja2** templates, using **SQLAlchemy ORM** to connect the backend to **SQLite** database, **PyTest** for automated testing, **docker-compose** for containerization, and self-hosted on a server with **Nginx**.
- Built a pipeline with **GitHub Actions** to continuously update the **Docker Image** in **Docker Hub** that is automatically pulled to the server for quick updates.
- Designed the website with a **scalable** structure to potentially support **multiple user profiles**, employing backend database instead of static website.

EEG-to-Text conversion by fine-tuning BART with zero-shot classification — Nov 2023

- Reproduced pioneering research to **convert EEG signal to embeddable text** by **fine-tuning BART** with custom data that achieved an **F1 Score of 25.9**.
- Implemented **zero-shot** algorithm using **PyTorch** to classify the generated texts for sentiment analysis of EEG signals with over **80% accuracy**.

Multiple Object Tracking by integrating GAN with FairMOT — Dec 2023

- Constructed **novel architecture** for **multiple object tracking** integrating **GAN with FairMOT**, demonstrating use of **generator** for tracking **bounding box**.
- Demonstrated that isolating generator to separate layer reduces tracking performance by **70%**, as the discriminator identifies fake data by layer of origin.

Soccer commentary/summary generation with Assistant-based GPT API — May 2024

- Enhanced the accuracy of AI-based game commentary and summary generation by **70%** using **GPT based Assistant APIs** with historic data from **Kaggle**.
- Processed the dataset using **pandas**, used **prompt engineering** to construct **event-based prompts** to pass to **GPT** model for event summary generation.
- Created front-end with **ReactJS** to integrate the text summary with relevant images and audio generated by **DALL.E, text-to-speech and translation models** with various APIs for better visuals and to emulate **Peter Drury's voice** for multilingual commentary for **enhanced engagement and accessibility**.

Object Recognition and Face Detection with TensorFlow and CUDA — Dec 2017

- Recognized objects in **real-time video feed**, detected faces continuously in **video frames** with **70% accurate bounding boxes** using **TensorFlow** library.
- Optimized the algorithm for concurrent and parallel execution on video frames using **CUDA in C++**, enhancing its performance by more than **50%**.

CERTIFICATIONS & AWARDS

- **Python for Data Science and Machine Learning Bootcamp** — Udemy Certificate — May 2021
- **Improving Deep Neural Network: Hyperparameter Tuning, Regularization & Optimization** — Coursera Certificate — Jul 2020
- **Neural Networks and Deep Learning** — Coursera Certificate — Jan 2020

Bi-annual Galactic Award for outstanding business excellence with data automation framework — Ericsson - 2020