

Asif Iqbal Rahaman

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Skills

- **Programming:** Python, Rust, TypeScript, Matlab, C++ , Java, Golang, SQL (MySQL, PostgreSQL), Bash, HTML, CSS, ReactJS, R
- **Frameworks:** Pandas, Numpy, FastAPI, RESTful API, Pytest, Flask, SQLAlchemy, Apache Spark, PyTorch, LangChain, Matplotlib
- **Tools:** Docker, Git, Jenkins, Unix, Linux, Nginx, MongoDB, Apache Airflow, Kubernetes, AWS, Azure, Terraform, GitHub Actions

Education

Virginia Tech, Blacksburg, VA Aug 2022 – May 2024
Master of Engineering in Computer Science and Applications (Data Analysis & AI) CGPA: 3.9/4.0
• **Courses:** AI Tools for Software Development, Natural Language Processing, Information Security, Applications of Machine Learning
Vellore Institute of Technology (VIT University), Vellore Aug 2015 – May 2019
Bachelor of Technology in Computer Science and Engineering CGPA: 8.0/10.0

Experience

Software Developer (Computation), Department of Systems Biology, Virginia Tech Oct 2022 – Present
• Formulated **novel algorithm** simulating cell cycles with large-scale boolean interaction graph perturbation (**1.6M+** nodes) enabling accurate pathway predictions for cancerous cells; published as **joint first author** (computational lead) in **PLOS One**.

- Executed simulations using **boolean models** and optimized performance over **5x** via **parallel processing** on **Linux** (HPC) cluster; built **Python** data validation pipelines using **APIs**, **Pandas**, **Numpy**, **PySpark**, and used **Matplotlib**, **NetworkX** for visualization.

Skills/Tech Stack: Python, Pandas, Numpy, Research, Simulation, Algorithm Design, Machine Learning, Optimization, Linux, GPU

Product Engineer, Seclere Technology Pvt Ltd Dec 2021 – Jul 2022

- Programmed a **DevOps automation** framework using **Python AWS CDK** and **boto3**, reducing customer onboarding time by **10x**.
- Orchestrated integration of key **AWS services** (RDS, ECS, EC2, CloudFormation, DynamoDB) to build **Infrastructure as Code (IaC)** with robust **SDLC** and contributed to features with **Go**, boosting DevOps team scalability and resource management by over **70%**.
- Architected **CI/CD pipelines** (**Docker**, **Jenkins**) for containerized microservices; applied **TDD (Pytest)** with **60%** code coverage.

Skills/Tech Stack: Python, AWS CDK, Docker, Jenkins, Pytest, GoLang, Java, Kubernetes, Microservices, Terraform, Agile

Software Engineer, Ericsson Global India Services Pvt Ltd Jan 2019 – Jul 2021

- Developed a **RPA framework** (Robotic Process Automation) with **Python** using **Flask**, **MongoDB**, **OpenCV** for automating network tasks, yielding **35%+** efficiency and **80%+** reliability; integrated with Ericsson's BotStore platform to **double** user adoption.
- Enhanced data security and compliance via migrating key management (**HashiCorp**) and implementing robust encryption methods.
- Engineered a rule-based recommendation engine for network cell analysis; further prototyped an **Machine Learning** alternative (**TensorFlow**, **PyTorch**, **PySpark**), improving prediction accuracy by over **20%** through feature engineering and model tuning.
- Architected scalable **ETL microservices** (**Python**, **Pandas**, **NumPy**) processing over **1B** rows from data warehouse using **REST API** (with **3x** increased reliability), storing as **Parquet** for **2x** faster **SQL** queries; automated pipeline using **Apache Airflow** and cron.

Skills/ Tech Stack: Python, Flask, SQL, NoSQL, Data Warehouse, Encryption, ML, PySpark, Pandas, ETL, Airflow, Microservices

Projects

Dynamic Personal Website using FastAPI and SQLAlchemy ORM Jul 2023

- Designed and launched a website with robust backend using **FastAPI**, **PyDantic**, **SQLAlchemy**, and **Jinja2**; implemented interactive features (themes and timeline), dynamic content generation, and scalable architecture with basic **role based access control**.
- Containerized (**Docker-compose**), tested (**Pytest**), and deployed to **Nginx** via automated **CI/CD** (**GitHub Actions** for Docker Hub).

EEG-to-Text conversion by fine-tuning BART (LLM) with zero-shot classification Nov 2023

- Converted EEG signals to text by fine-tuning **BART** model on custom data, optimizing hyperparameters achieving **25.9 F1 score**.
- Integrated **zero-shot classification** (**PyTorch**, **80%** accuracy) for sentiment analysis on generated text, with processing pipeline.

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

- Built AI pipeline via **GPT Assistant API** and prompts for event-driven, multilingual commentary with real-time adaptation.
- Engineered **ReactJS** frontend integrating text, audio (**TTS** with voice emulation), and images (**DALL·E**) for multimodal experience.

Real-time Sentiment and Subjectivity Trend Analysis for Social Media Feb 2025

- Automated ingestion of Twitter/Reddit posts (**APIs**, **GitHub Actions**); processed sentiment via **PySpark** on **Databricks** in **Azure**.
- Set up an interactive **Python Streamlit** dashboard to **Azure** (via **GitHub Actions** CI/CD) visualizing real-time sentiment trends.

Cross-Platform AI Chatbot and Assistant App with Custom API Keys Apr 2025

- Integrated **OpenAI's** capabilities (chat, image and speech generation etc) into a user-friendly platform using **LangChain**.
- Created **cross-platform** application leveraging **React Native** and **Expo**, ensuring efficient code reuse and rapid deployment.

For more details on many other projects, please visit my [website](#) or [GitHub](#).

Certifications and Awards

Python for Data Science and Machine Learning Bootcamp	Udemy (May 2021)
Improving Deep Neural Networks: Hyperparameter Tuning, Regularization & Optimization	Coursera (Jul 2020)
Neural Networks and Deep Learning	Coursera (Jan 2020)
Biannual Galactic Award for developing data automation framework	Ericsson (Oct 2020)