

SAMRAT DUTTA

Software Engineer

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TECHNICAL SKILLS

Languages: Java, Python, Go (Golang), C, JavaScript, TypeScript, HTML, CSS, SQL

Backend: Microservices Architecture, RESTful APIs, GraphQL, Maven, OpenLiberty, Django, Flask

Frontend: React.js, Carbon Design System, Responsive Web Design, Accessibility (WCAG), GraphQL Client

Databases: MongoDB, NoSQL, Firebase Firestore

Cloud & DevOps: Docker, Kubernetes, Red Hat OpenShift (ROSA), CI/CD Pipelines, Container Orchestration

LLMs: Large Language Models (LLMs), Retrieval-Augmented Generation (RAG), Prompt Engineering, RE2 Prompting, Model Context Protocol (MCP), Open-Source LLMs (LLaMA, Mistral, Ollama), Fine-Tuning, LangChain, AI Agents, Serverless Systems

Machine Learning: Deep Neural Networks (DNN), NLP, LSTM, TensorFlow, NumPy, Pandas, Matplotlib, Scikit-learn

Other: Git, Agile/Scrum, TDD, AES Encryption, Curve25519, IoT, LoRa, Arduino, ESP32, Android (Java, Flutter), GTK

PROFESSIONAL EXPERIENCE

Software Engineer

July 2022 – Present

IBM – India Systems Development Lab (ISDL), Bangalore

Backend Engineer – IBM Storage Defender

- Designed and developed large-scale microservices for IBM Storage Defender using Java, Maven, OpenLiberty, Go, and Python (Django), with MongoDB as the primary data store.
- Contributed approximately 65% of the codebase in a critical microservice, owning end-to-end feature development from design through production deployment.
- Deployed and managed microservices on Docker, Kubernetes, and Red Hat OpenShift (ROSA) clusters, ensuring high availability, seamless scaling, and zero-downtime deployments.
- Built RESTful APIs and GraphQL endpoints for service-to-service communication and frontend data consumption across distributed systems.
- Implemented comprehensive test suites using TDD practices; applied security best practices including input validation, authentication, and authorization.

Frontend Engineer – IBM Ceph as a Service

- Developed responsive frontend web applications using React.js, Carbon Design System, and GraphQL for data fetching and state management.
- Ensured WCAG accessibility compliance with keyboard navigation and screen reader support; collaborated with UX designers and backend teams to deliver performant interfaces.

Others

AI/ML & LLM

- Built POC applications using LLMs including IBM WatsonX, IBM Bob (internal), LLaMA, and Mistral, implementing RAG pipelines, advanced prompt engineering (RE2, chain-of-thought), and Model Context Protocol (MCP) for AI agent orchestration.

Cross-Functional Collaboration

- Collaborated with globally distributed teams across US, Europe, and Asia; participated in Agile/Scrum ceremonies including sprint planning, standups, and retrospectives.

Android App Developer (Intern)

June 2021 – July 2021

Ardent Computech, Durgapur

- Built a prototype job portal Android application using Flutter and Firebase Firestore with user authentication, job listings, and real-time data synchronization.

EDUCATION

Bachelor of Technology – Computer Science and Engineering

Aug 2018 – Jun 2022

Dr. B. C. Roy Engineering College (MAKAUT), Durgapur

CGPA: 8.97 / 10

PUBLICATIONS & RESEARCH

DisasChat: End-to-End Encrypted Off-Grid LoRa-Based Smartphone Communication System

Published in IEEE | ieeexplore.ieee.org/document/10040007

Feb 2022 – May 2022

Designed an off-grid encrypted communication system using LoRa, ESP32, AES encryption, and Curve25519 key exchange for disaster and crisis scenarios.

SecLoRa: Secure LoRa-Based Communication System for Residential Smart Grids

Published in IEEE | ieeexplore.ieee.org/document/9972521

May 2022 – Aug 2022

Developed a secure communication protocol for smart grid infrastructure using LoRa wireless technology and AES encryption on ESP32.

Chronological Verification of the Collatz Conjecture with Mathematically Proven Sieve

Published in UGC indexed journal | [DOI:10.21608/ejmaa.2025.334871.1289](https://doi.org/10.21608/ejmaa.2025.334871.1289)

May 2023 – Nov 2023

Implemented an algorithmic approach using number theory and bit manipulation to verify the Collatz conjecture with a novel sieve method.

NOTABLE PROJECTS

NPM Vulnerability Checker | [GitHub](#)

Cross-platform C application with dual GUI (native Windows / GTK for Linux/macOS) and CLI modes that analyzes NPM projects for vulnerable packages. Scans dependency trees via `npm list`, matches against a CSV vulnerability database, and generates detailed reports distinguishing direct vs. indirect dependencies.

RunPod Ollama Multi-Model Runner | [GitHub](#)

Tool for deploying and running multiple open-source LLM models simultaneously on RunPod GPU instances using Ollama, enabling efficient inference and model comparison on cloud GPU infrastructure.

Indoor Context Recognition Using Heterogeneous Pollution Sensors

Nov 2021 – Mar 2022

Built a deep learning pipeline using TensorFlow and DNNs to classify indoor environments from pollution sensor data via Arduino and IoT sensors.

Cowisecare – Medical Help Lead Finder App | DISCONTINUED

Apr 2021 – Jul 2021

Full-stack Android app (Java) with Python backend and Firebase to find medical assistance leads during the COVID-19 pandemic.