Prakhar Sharma

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Education

- **Indian Institute of Information Technology and Management** — Gwalior, Madhya Pradesh, India
  Integrated B.Tech and M.tech in Information Technology; CGPA: 7.63 — *June 2016 - May 2021*

Skills Summary

- **Languages**: Javascript, Typescript, Python, C++, Bash, Scala
- **Backend Development**: NodeJS, Django, Express.js, GraphQL, Akka, FastAPI, Flask, Langchain, PydanticAI
- **Databases**: InfluxDB, Redis, MongoDB, Firebase, Qdrant
- **Deployment orchestration and messaging queues**: Kafka, Telegraf, RabbitMQ, MQTT, Kubernetes, Terraform, GCP, AWS
- **Frontend Development**: HTML, CSS, Angular, JQuery, React.js, Redux, Wordpress
- **Android Development**: Ionic (Hybrid w/ Angular)
- **Blockchain Development**: Solidity, web3.js, Multichain, Hyperledger Aries, Ethereum, IPFS, IPFS cluster
- **Public APIs**: Git, Discord, Telegram, AWS, Facebook, Slack
- **Linux, Embedded Systems and Others**: Docker, Git, Arch Linux, Basic Kernel Development, BeagleBone Black, Intel NUC, Arduino, Raspberry Pi, LaTeX, Nginx, LLM

Experience

- **Sheru** — Remote
  Fullstack Developer Intern — *June 2020 - September 2020*
  - **Admin Dashboard**: Developed an admin panel for Sheru using Django, NodeJS for managing and analysing supply, demand and marketing frameworks

- **Sheru** — Remote
  Senior Fullstack Developer — *June 2021 - June 2024*
  - **Microservices**:
    - TATA Power - Battery Energy Storage System (BESS) Project
      - Designed and implemented a robust software to control and monitor a 10 MW Battery Energy Storage System (BESS) facility with 4 cores, each comprising 31 nodes equipped with PCS and BMS. The facility also has a Bender, 4 meters, and 4 relays.
      - Established reliable modbus communication for data acquisition, including real-time monitoring, historical data logging, and actionable live alerts, integrating Kafka, Redis, and InfluxDB for data flow and storage.
      - Engineered a fine-grained power distribution system enabling control at individual cores, cumulative facility level, and distribution levels, with import/export/idle state management.
      - Developed scalable microservices exposing APIs for dashboards, providing real-time facility controls, live alerts, and historical data visualization.
      - Configured 4 Intel NUCs which gather data locally from each core and publish it to Kafka and also take automatic safeguard actions based on alerts.
      - Enhanced operational efficiency by delivering a fully integrated, data-driven, and remotely controllable power management solution.
    - Developed a microservice for converting text to chart using open source Large Language Models (LLM). Tech used: BERT LLM, Defog.ai-SQLCoder2, InfluxDB, Flask, Python
    - Developed an asset and telemetry microservice for communication with IoT devices using a TLS encrypted TCP connection. Integrated parsing logic of encoded data for multiple battery management systems and IoT vendors. Also integrated asset control with RabbitMQ. Tech used: Node.js, Kafka, RabbitMQ
    - Developed the alerts microservice which generates priority based alerts and takes automatic asset control actions based on IoT and battery data. Developed architecture for spawning worker parent and child processes in node for parallel consumption of high throughput data from Kafka. Tech used: Node.js, Kafka, Redis, Firebase, RabbitMQ, MongoDB
    - Developed a cron microservice for running scheduled jobs to automate various workflows. Tech used: Node.js, Agenda.js, Kafka, Redis, Firebase, RabbitMQ, MongoDB, InfluxDB
    - Developed a Kilometer Estimation microservice for predicting kilometers with accuracy using GPS and SoC data of a battery. Tech used: Node.js, MongoDB, InfluxDB, OSRM
    - Developed a microservice for handling battery swapping workflows. Tech used: Node.js, Kafka, Redis, Firebase, MongoDB
    - Developed a microservice for the energy stack to get inverter data using serial communication. This is deployed on Raspberry Pi and BeagleBone Black, thus creating a script for setting up on such hardware and enabling remote tunnel through SSH into these devices. Tech used: Node.js, Kafka, MQTT, Redis, MongoDB
    - Developed a microservice using Akka Cluster to dynamically distribute the energy import/export between multiple vending machines spread out over different regions. Tech used: Akka, Scala

    - Produced metrics from each of the microservices and AWS EC2 instances into kafka and ingested them into InfluxDB using telegraf to generate alerts based on resource consumption, availability of microservices/ EC2 instances, to monitor performance of APIs, to track resource consumption
    - Developed, optimized and rearchitected multiple microservices for better scalability, robustness and availability
  - **Deployments, Shell Scripting:**:
    - Responsible for complete end to end implementation and deployment of a confluent kafka node with zookeeper, kafka server, schema-registry, kafka-rest, kafka-connect, ksqldb and control-center in AWS EC2 alongwith SSL and SASL in all of the components. Achieved production and consumption throughput of 100 MBps while benchmarking
    - Responsible for deployment of an InfluxDB node on an AWS EC2 server and rearchitecting data storage from earlier storing data in MongoDB and AWS S3 to using Kafka, Telegraf and InfluxDB to store time based IoT device data, microservice metric data and AWS EC2 instance metric data
    - Responsible for complete end to end implementation and deployment of a Redis cluster consisting of one master and two replicas with redis sentinels on AWS EC2.
    - Created terraform scripts to deploy a microservice on AWS Elastic Kubernetes Service
    - Created shell scripts for replication of influxdb data across EC2 servers, automatic weekly updation of OSRM data using scripts for automated EC2 creation/ deletion, automated build and deployment of react apps, created various daemons to solve availability related issues etc.
    - Creation of a fully secure node from a baremetal VM in E2E networks
    - Responsible for deployment of a 34 B parameter LLM model (defog.ai-sqlcoder) on an EC2 GPU instance and cost optimizing by saving LLM in 4 bit quantization to reduce model size and model load time. Created a flow to automatically stop instances during periods of non-utilization, reducing costs.
    - Responsible for deployment of RabbitMq
    - Nginx deployment alongwith certbot, load balancing

- **Breast Cancer in Young Women Foundation (BCYWF)** Remote
  Technical Lead - Freelance *April 2024 - Present*
  - Working as a freelance developer developing wordpress websites for Breast Cancer in Young Women Foundation (BCYWF) whose mission is to save the lives of young women from breast cancer by raising awareness, facilitating the early detection and treatment of breast cancer, funding advanced research that directly benefits young patients, addressing the quality-of-life issues post-treatment, and building a future free of breast cancer for young women.

- **ScaleGenAI** Remote
  Senior AI Engineer *June 2024 - Present*
  - **SQLBot**: Developed an AI-powered copilot for SQL queries that supports 40+ relational databases. It allows users to connect databases, ask text questions based on their data, and receive AI-generated SQL queries, charts, and answers after running the SQL query on the database. SQLBot leverages a knowledge graph and RAG to enhance accuracy. It also includes a custom algorithm that boosted accuracy further by 10%. The project achieved over 85% accuracy, ranking 3rd (unpublished) on Yale University's Spider Eval leaderboard. Tech used - Python, FastAPI, Langchain, Qdrant, SQLAlchemy, Defog's SQLCoder
  - **TheAgentic**: Contributed to the development of the core microservice for TheAgentic, a cutting-edge LLM designed for AI agents with advanced multi-step reasoning, function calling, and structured outputs. Created high-quality datasets to fine-tune the flagship model, ensuring optimal performance across diverse use cases. Implemented algorithms that improved model accuracy by 10-15%, enhancing its competitive edge. Conducted benchmarking on public evaluations, including BFCL, T-Eval etc. to validate and optimize model performance.
  - **Agentic Bench**: Developing Agentic Bench, an AI-powered copilot leveraging multi-agent systems (WebSurfer, FileSurfer, Coder, Executor, and Orchestrator) for advanced query answering. Currently working on improving system robustness and expanding functionality.

Projects

- **B.Tech Project**: (Research in trend prediction) Developed a time series prediction tool using fuzzy logic and fuzzy information retrieval system to predict the trends in stock markets using Python, using metrics such as RSI, common candlestick patterns, NIFTY50/ BSI OHLC data.
- **M.Tech Project**: (Research in blockchain) This project explores the integration of IoT and Blockchain to propose a robust and secure architecture which overcomes the existing issues with IoT sector involving device integrity, device registration, security and data privacy by using Hyperledger Aries and BeagleBone Black as the IoT device. It also explores an architecture for replicating device data across a cluster of peers comprised of IoT devices in a decentralized fashion by using IPFS and IPFS cluster.
- **Self Learning/ Open Source Projects**:
  - Open Source Contributor to Accord Project (Linux Foundation's Project)
  - Open Source Contributor to Polkadot hackathon in GitCoin
  - Open Source for MetaGame - Developed a script that captures the messages from discord chat using a bot, extracts the repo name from the message and acknowledges if the issue was posted on a Github repo
  - Developed a switch log sniffer for Computer Networks Project using shell scripting
  - Developed USB device drivers for Operating Systems Project (for Linux)

Volunteer Experience

- Conducted a Linux Workshop organised by AASF, the technical club of ABV-IIITM, Gwalior
- Event Management Team Member in Infotsav 2k18, the annual technical fest of ABV-IIITM, Gwalior