Sahil Chukka

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Professional Summary

Data Science and ML professional with expertise in Python, PyTorch, Scikit-learn, and full-stack development (React, TypeScript, FastAPI). Experienced in building production-grade applications with offline-first architecture, real-time sync, REST APIs, and cloud deployment (Azure, AWS). Published researcher in deep learning for medical imaging with strong skills in data engineering, model optimization, and business intelligence.

Technical Skills

Programming: Python, TypeScript, JavaScript, SQL, HTML, CSS
Frameworks: React, FastAPI, Flask, Scikit-learn, PyTorch, Keras
Databases: MySQL, SQLite, MSSQL Server, IndexedDB
Cloud & Tools: Microsoft Azure, Git, GitHub, Postman, Power BI
AI & GenAI: LangChain, Phidata, CrewAI, LLMs, RAG, Hugging Face
Visualization: Matplotlib, Seaborn, Power BI
Other: REST APIs, Offline-First Architecture, PWA, Web Scraping

Professional Experience

BI Executive

TPF Engineering Pvt Ltd, Navi Mumbai   **Sept 2025 – Present**
MBIU Pro – Bridge Inspection Mobile Application

- Architected and developed a full-stack Progressive Web App (PWA) for standardized bridge/culvert inspections using React, TypeScript, FastAPI, and SQLAlchemy with offline-first capabilities,

- Implemented IndexedDB-based local storage with bi-directional sync logic, enabling field engineers to capture inspection data, images, and GPS coordinates offline with automatic cloud sync when online,

- Designed and developed RESTful APIs with FastAPI for CRUD operations, Microsoft SSO authentication, section-wise form submissions, image uploads, and automated PDF report generation.

- Integrated real-time ML inference API for crack detection in uploaded images, processing Base64-encoded data and overlaying severity analysis on structural damage photos.

- Built dynamic, schema-driven forms rendering different protocols (MNB, MJB, Flyover, Culvert) based on structure type, with multi-step validation and GPS-tagged geolocation.

- Implemented cross-device data consistency with conflict resolution, ensuring inspection records created on mobile sync correctly with desktop clients and central.

NSV Dashboard – Road Condition Analytics

- Cleaned, transformed, and structured raw field data to build an NSV (Network Survey Vehicle) analytics workflow.

- Designed interactive dashboards for monitoring road conditions, identifying critical stretches, and supporting data-driven decisions.

- Utilized SQL and Power BI for data modeling, validation, and geospatial visualization.

Employee Performance Dashboard – KPI Reporting

- Collected and consolidated task-level data from senior management to build a unified performance evaluation workflow

- Performed data cleaning, modeling, and metric definition for reliable KPI visualization.

- Built interactive Power BI dashboards for tracking productivity trends, task completion efficiency, and performance insights.

Data Science Engineer Intern

Finisar Technology India Pvt Ltd, Hyderabad   **Apr 2025 – Sept 2025**
Automated CAD Workflow API

- Developed integrated agent-based services (dimension extractor and CAD query engine) exposed via Flask API endpoints, handling Base64 image encoding, JSON parsing, and automated CAD file generation

- Designed and implemented RESTful APIs using Flask, enabling secure file uploads, validation, and downstream processing for automated modeling workflows

- Deployed the end-to-end API pipeline internally on AWS, ensuring controlled access, scalability, and reliable internal usage

- Built and tested APIs with Postman, ensuring reliability and consistent response formats across multiple error scenarios

Garnet Prediction Analysis

- Engineered an end-to-end predictive pipeline using XGBoost regression to model Mn concentration in Garnet, including rigorous preprocessing with skewness correction and feature scaling

- Optimized model performance through automated hyperparameter tuning with Optuna, leveraging Bayesian optimization for efficient parameter search

- Achieved robust evaluation using Mean Absolute Error (MAE), validating predictive accuracy and reliability on cleaned datasets

- Deployed the trained model and inference workflow internally on AWS, enabling reproducible analysis and controlled access for domain users

SalesBot – Conversational AI with Retrieval-Augmented Generation (RAG)

- Developed a conversational AI bot for internal sales queries using Retrieval-Augmented Generation (RAG)

- Processed and indexed company product manuals (PDFs) into ChromaDB using vector embeddings (OpenAI) for efficient semantic retrieval

- Implemented semantic search and similarity matching to deliver accurate, context-aware responses

- Integrated the RAG pipeline with a Flask-based REST API and deployed internally on AWS, enabling scalable and secure query handling for enterprise users

Academic Projects

Detection of Choroidal Neovascularization (CNV) Using Deep Learning   May 2023 – May 2024

- Implemented deep learning models including VGG16, ResNet50, DenseNet121, InceptionV3, and EfficientNet to detect Choroidal Neovascularization (CNV) in OCT scans

- Conducted model benchmarking and evaluation, achieving 95%+ classification accuracy and strong ROC-AUC scores using a large-scale OCT dataset

- Performed comparative analysis of CNN architectures to identify trade-offs between accuracy, computation time, and model complexity

- Built the best-performing model as a Flask-based web application, enabling real-time OCT scan uploads and automated CNV prediction

- Contributed to early disease detection in healthcare, demonstrating the application of deep learning in medical imaging

Virtual Assistant using NLP and Neural Networks   Jan 2022 – May 2022

- Designed and implemented a custom neural network in PyTorch with multi-layer feedforward architecture for intent recognition and classification

- Developed an end-to-end NLP pipeline using tokenization, bag-of-words vectorization, and embedding generation, trained on a structured dataset

- Integrated speech-to-text and text-to-speech modules for hands-free interaction, creating a seamless conversational interface

- Trained, saved, and reloaded PyTorch models for real-time inference, achieving high-confidence predictions (75% threshold) across multiple user intents

Achievements & Certifications

- Published research paper *"Evaluation of Deep Learning Approaches to Detect Choroidal Neovascularization"* in IJIGSP, Aug 2025

- Received copyright registration (ROC No. L-147798/2024) from the Government of India for the academic project *"Web Application to Detect Choroidal Neovascularization"*

- Microsoft Certified: Azure AI Fundamentals (AI-900), Aug 2025

- Complete Generative AI Course with LangChain and Hugging Face, May 2025

Education

Bachelor of Technology in Information Technology   May 2020 – May 2024
University of Mumbai (Pillai College of Engineering, New Panvel)
CGPA: 8.22 / 10