Swaraj Khan P

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A motivated Computer Science student with a strong passion for Python programming and machine learning. Seeking an internship to apply theoretical knowledge in real-world projects, enhance software development skills, and advance expertise in machine learning techniques.

Education

Dayananda Sagar University, Bengaluru   **2021 - 2025**
B.Tech in Computer Science & Engineering   *7/10 CGPA*

The Amaatra Academy, Bengaluru   **2020 - 2021**
Class 12 PCMC   *79%*

Work Experience

Draconic AI   **Oct '24 – Present**
Machine Learning Engineer — Founding Intern   *Remote*

- Architected a comprehensive data engineering pipeline leveraging FastAPI endpoints to extract real-time OHLCV trading data from Zerodha and Dhan platforms, implementing dual-storage strategy with Redis for high-speed access and PostgreSQL (Supabase) for persistent storage.
- Developed advanced computation modules for critical trading metrics including candlestick patterns, price action indicators, swing analysis, and options chain analytics, optimizing data availability for algorithmic trading decisions.
- Designed and implemented a secure authentication system with Google OAuth and WhatsApp OTP verification, integrating with Supabase backend for robust user management in a production environment.
- Engineered multiple AI agent systems using CrewAI, Agno, and Smol frameworks, creating both Anthropic Claude-powered production agents and open-source HuggingFace alternatives, while implementing a comprehensive LLM monitoring system tracking token usage and response latency.
- Built dual-purpose Retrieval Augmented Generation (RAG) systems: (1) a general knowledge base indexing 60+ trading books by renowned authors, and (2) a personalized system enabling analysis of user-uploaded trading journals and TradingView charts combined with real-time market data.
- Conducted systematic prompt engineering experiments using PromptLayer to optimize LLM performance across different contexts, significantly enhancing response quality and reducing token consumption.

Nokia   **Mar '24 – July '24**
Chatbot Development — Intern   *Bangalore*

- Engineered a production-grade AI-powered chatbot for Nokia's ticketing and testing teams, automating log issue resolution and reducing manual workload by 40% while improving operational efficiency.
- Enhanced chatbot query accuracy by 25% through implementation of advanced NLP techniques and BGE3-Large vector embeddings, optimizing response relevance and achieving a 92% user satisfaction rate.
- Integrated real-time database retrieval with optimized caching mechanisms, cutting response times by 30% and improving scalability for enterprise-level deployment.
- Selected to present the project at Nokia Bangalore University Connect (NBUC) program, a prestigious event attended by academic partners and senior technical leadership, receiving recognition for innovative approach to automated support systems.

Dexian   **Jul '23 – Aug '23**
Machine Learning — Intern   *Bangalore*

- Designed and implemented a high-accuracy heart stroke prediction system using ensemble methods including Random Forest (94.5%), Gradient Boosting (94.1%), and Logistic Regression (75.4%), enabling early risk assessment for preventative care.
- Optimized data preprocessing pipeline with advanced feature engineering techniques, improving overall model performance by 10% while reducing computational overhead by 15%.
- Developed interactive visualization dashboards using Matplotlib and Seaborn to communicate critical insights to medical stakeholders, facilitating data-driven decision making for patient interventions.

Projects

finanalysis: Comprehensive Financial Analysis Python Package (In Development)   Source code

- Currently developing a pure Python PyPI library designed to offer 30+ financial metrics for stock market technical analysis, enabling traders and financial analysts to make data-driven investment decisions.
- Implementing four major analysis categories: candlestick pattern recognition (range, body size, shadow ratios), price action indicators (momentum, acceleration, trend strength), swing metrics (duration, magnitude, pivot points), and options analysis (put-call ratios, implied volatility, open interest).
- Designing a clean, intuitive API focused on performance optimization with vectorized operations for handling large datasets of historical market data with minimal computational overhead.
- Creating comprehensive documentation with practical examples demonstrating how traders can integrate the package into their existing analysis workflows, complete with visualization capabilities.

Binary Image Classification with CNN   Source code

- Developed a robust image classification system using Convolutional Neural Networks (CNN) to distinguish between cat and dog images with 70% validation accuracy
- Implemented a multi-layer architecture with two convolutional layers (32 and 64 filters), max pooling, and dense connections using TensorFlow and Keras
- Engineered efficient data preprocessing pipeline for normalizing $100{\times}100{\times}3$ pixel images and optimizing model training on 2,000+ samples
- Achieved consistent performance improvement across training epochs from 55% to 90% accuracy through hyperparameter tuning and architecture optimization

Autonomous Driving - Car Detection   Source code

- Implemented a state-of-the-art YOLO (You Only Look Once) object detection system for autonomous vehicles, achieving 89% accuracy in identifying cars, traffic lights, and other road objects under various lighting conditions
- Engineered critical algorithms including non-max suppression and intersection over union (IoU) calculation to eliminate redundant detections and improve localization precision
- Optimized tensor operations using TensorFlow to process the model's $19{\times}19{\times}5{\times}85$ dimensional output volume for real-time detection capabilities
- Developed custom filtering algorithms to extract meaningful predictions from complex neural network outputs, enabling accurate bounding box generation around detected objects

World Port Priority Score Predictor   Source code

- Developed an interactive web application using Streamlit that analyzes and visualizes global port data, allowing users to evaluate port suitability based on physical characteristics
- Implemented a machine learning model using joblib to predict priority scores for ports based on critical maritime parameters (overhead limit and tide range)
- Created dynamic geospatial visualizations with GeoPandas, enabling users to filter and display port locations by country on an interactive map interface
- Designed a robust priority scoring algorithm that evaluates port accessibility factors, providing maritime logistics companies with data-driven insights for route planning and vessel selection

Publications

Automated PDF Q and A Chatbot: Harnessing AI for Efficient Information Retrieval   2024

IRF International Conference   *Pune, India*

- Developed an AI-driven PDF-based Q&A chatbot utilizing text extraction, chunking, and cosine similarity matching for accurate information retrieval without relying on generative AI.
- Implemented advanced data sanitization techniques to prevent XSS attacks, enhancing security while maintaining sub-second response times.
- Created comprehensive logging mechanisms to track interactions and queries, improving system reliability and user experience.
- Presented research findings demonstrating how efficient document parsing and vector representation can outperform conventional NLP techniques for specific Q&A applications.

Democratizing Machine Learning: A KNN-Guided Adaptive AutoML Framework   **2025**
Accepted for Publication   *IEEE Conference*

- Co-authored research introducing a novel AutoML pipeline that automates preprocessing, model selection, and hyperparameter tuning for structured and time-series data.
- Developed a K-Nearest Neighbors approach for neural architecture determination that achieved 91.19% average accuracy across ten CSV datasets and 63.66% loss reduction across time-series datasets.
- Created a flexible framework supporting multiple data types including CSV, time-series, and image datasets with specialized processing pipelines.

Smart Surveillance: AI-Driven Threat Detection and Women Safety Enhancement   **2025**
Accepted for Publication   *IEEE Conference*

- Collaborated on an innovative surveillance system that leverages Raspberry Pi 5 for edge computing, enabling real-time threat detection and response.
- Integrated multiple detection models including face emotion recognition, weapon detection, violence detection, and behavior analysis to create a comprehensive security solution.
- Developed the alert management system using Telegram chatbot for instant notification, allowing rapid response to potential security threats.
- Contributed to system evaluation achieving over 90% accuracy in violence detection and 86% accuracy in weapon detection across various test scenarios.

Technical Skills

AI/ML: LLM (Anthropic, Hugging Face), RAG Systems, Agentic Framework, PyTorch, Pandas, NumPy
Languages: Python, SQL
Web Technologies: Chainlit, Streamlit, Web Scraping, Langchain, LlamaIndex
Developer Tools: Docker, Git, VS Code, GitHub
Databases & Infrastructure: Redis, PostgreSQL, Grafana, Logfire, Ray, SQS

Certificates

Deep Neural Networks with PyTorch   **Coursera**
Certification Link

Deep Learning Specialization by Andrew Ng (5 Modules)   **Coursera**
Specialization Link

Achievements

ETL Hackathon   **2025**
Secured 1ˢᵗ Place   *Dayananda Sagar University*

- Developed a data pipeline to extract cricket player statistics from Cricbuzz, transform the data for user comparison, and visualize results through interactive bar and pie charts.
- Ranked 1ˢᵗ out of 300 participating students, demonstrating exceptional data engineering and visualization skills.

Discord Bot Creation   **2025**
Entertainment Project

- Engineered a Discord bot simulating Bitcoin mining, where users solve math problems ranging from simple to intermediate difficulty to earn virtual bitcoins.
- Enhanced user engagement through gamification, creating an educational tool that teaches both mathematical concepts and basic cryptocurrency principles.