RAMA KRISHNA BANDALAPATI

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Summary

AI/ML Developer 1+ years of experience in building end-to-end machine learning pipelines using Python, Scikit-learn, and TensorFlow. Experienced in deploying NLP and computer vision models with Streamlit, FastAPI, and vector databases. Focused on delivering real-world solutions and scaling AI projects from prototype to production.

Experience

Forms, Products ,business rules (prediction)

Tech Stack: Python, Pandas, Scikit-learn, FastAPI, JSON,

- Built a system to analyze form data and recommend best-fit products based on user inputs.
- Accepted CSV form submissions containing customer details and product preferences.
- Encoded business rules exclude risky products using a modular logic engine.
- Trained ML models to predict product suitability using historical purchase data.
- Combined rule outcomes with ML predictions to generate final product recommendations.
- Supported top-N ranking and filtering based on eligibility, budget, or risk thresholds.
- Deployed as an API using FastAPI for integration with CRM tools.
- Predicted the data for bulk uploads, products,forms and business rule explanations.
- Enabled business users to configure rules dynamically via JSON without coding.
- Improved recommendation accuracy and reduced manual screening by 80%.

OCR Text Extraction from Scanned PDFs

Tech Stack: Python, Tesseract OCR, OpenCV, pdf2image, pytesseract, spaCy, FastAPI, JSON, CSV, GitHub Actions

- Developed a robust OCR pipeline to extract text from scanned, image-based PDFs using Tesseract OCR.
- Converted multi-page PDFs to high-resolution images (300+ DPI) using pdf2image to ensure OCR precision.
- Applied OpenCV preprocessing techniques—grayscale, denoising, and thresholding—to enhance text clarity.
- Utilized pytesseract.image_to_string() for full-text extraction and image_to_data() for layout analysis.
- Performed noise cleaning using regex and NLP to correct punctuation, spacing, and line breaks.
- Enabled multilingual text recognition using language-trained Tesseract models.
- Added confidence scoring to highlight low-accuracy OCR results for manual validation.
- Integrated with downstream processes such as document classification and field-level validation.
- Achieved 90–95% accuracy on typical business documents like invoices and contracts.
- Reduced manual data entry time by over 80% in scanned document workflows.

Smart Chatbot using Vector Database and Gemini AI

Tech Stack: Python, LangChain, OpenAI, FAISS, FastAPI, Streamlit, Scikit-learn, PyMuPDF JSON, Supabase

- Developed a document-aware chatbot powered by Gemini AI that answers user queries based on file content.
- Implemented chunking to split large documents for efficient context retrieval.
- Converted text chunks into vector embeddings and stored them in FAISS for similarity search.
- Retrieved the most relevant chunks based on user queries and passed them to Gemini AI for accurate responses.
- Built a FastAPI backend to serve the chatbot as a RESTful API.
- Designed an interactive Streamlit web app for document upload and real-time chat.
- Supported multiple file formats including PDF, Word, and plain text.
- Optimized response quality with prompt engineering and fallback logic.

- Integrated chat history to support context-aware, multi-turn conversations.
- Enabled batch document uploads with background processing.
- Achieved response times under 2 seconds for seamless user experience.
- Automated workflows with GitHub Actions for deployment and testing.
- Helped users extract insights from large documents without reading them manually.

Cost-Optimization Agent for Decision Tree Structures

Tech Stack: Python, LangChain, OpenAI, FastAPI, Streamlit, Scikit-learn, JSON

- Designed and developed an **Agentic AI system** to optimize decision tree logic by minimizing total inference cost without sacrificing accuracy.
- Parsed and interpreted decision trees represented in JSON format, including node-level cost metrics.
- Utilized LLMs to perform intelligent reasoning over decision trees and identify cost-effective decision paths.
- Applied optimization techniques such as pruning, feature reordering, and heuristic evaluation to restructure trees for reduced computational overhead.
- Integrated LangChain agent tools to simulate and evaluate alternative decision paths dynamically.
- Combined traditional ML techniques (from Scikit-learn) with LLM-based reasoning to improve tree efficiency.
- Deployed a FastAPI microservice to expose agent recommendations via RESTful endpoints for easy backend integration.
- Created a real-time Streamlit dashboard to visualize decision paths, simulate different scenarios, and track cost savings.
- Enabled analysis to test alternate tree configurations under budget or time constraints.
- Achieved up to 40% reduction in average prediction cost while maintaining or improving performance.
- Designed the pipeline to be modular, scalable, and easily integrable with existing ML or decision systems.
- Ensured transparency, auditability, and user control in every optimization decision, empowering non-technical stakeholders to fine-tune logic.

Skills

Programming Languages: Python, Core Java, SQL, HTML/CSS

Data Analysis & Visualization: Power BI, Pandas, NumPy, Matplotlib, Seaborn

Machine Learning & Deep Learning: Classification & Regression Models, Neural Networks, NLP, Generative AI, MLOps

Recognition Systems: Image Recognition, Voice Recognition

Prompt Engineering: Zero-shot, One-shot, Few-shot Prompting, Role-based Prompt Design

Tools & Platforms: VS Code, Google Colab, Eclipse, Git, Bitbucket

Frameworks & Agent Systems: CrewAI, Agentic AI, Smol-AI Agents, Phi Data Agents

Research : Developed intelligent **n8n Agents** with **custom workflows**, automation logic for real-world use cases

Education

B. Tech in **computer science and engineering** from JNTUK, Kakinada**.** **(2018-2022)**

Professional Organizations

Currently associated with **Insorce operational optimizers private limited** **(June2024 -present)**