

# MONALI PANDA

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Experienced Backend & AI Engineer with expertise in Python, Flask, Django and FastAPI, specializing in scalable backend development, API integration, and data pipeline optimization. Skilled in machine learning, generative AI, and automation, with a proven ability to build data-driven applications, streamline workflows, and deploy AI-powered solutions.

## PROFESSIONAL EXPERIENCE

### **FREELANCER - Consultant ( JAN 2025 - Present )**

**Bengaluru, India(Hybrid)**

**Psychometric test creation :** Designed and implemented a psychometric test on Zoho Survey, integrating its API for automated test administration and data retrieval. Developed a theory-based scoring logic to provide personalized career recommendations for Class 8 and above students based on their interests, aptitude, and personality traits. Leveraged the OpenAI model to summarize individual reports dynamically. Automated PDF report generation using FastAPI, Jinja templates, HTML, and CSS, ensuring structured and accessible career guidance.

### **HEALTHARK INSIGHTS - Consultant ( MAR 2023 - Dec 2024 )**

**Bengaluru, India**

Develop efficient data classification pipelines, integrated APIs seamlessly, and constructed interactive web pages to facilitate the optimal functioning of these data models.

- **Lung Cancer Data Classification & Predictive Modeling :** Applied ensemble modeling (Random Forest, Extra Trees, XGBoost) to analyze mutation data, implementing advanced data cleaning, normalization, visualization, and feature engineering. Improved predictive accuracy for lung cancer research and enabled personalized treatment strategies through clinical genomics insights.
- **Virtual AI interviewer:** Developed an AI-driven virtual HR assistant designed to automate the candidate screening process. The system uses Gemini AI Model to extract relevant information from PDF resumes, generate customized interview questions based on candidates' experience and skills, and evaluate their responses. Integrated voice recognition capabilities to allow candidates to submit voice responses, which are then transcribed into text and evaluated for candidate screening.
- **AI Mentor Bot :** Developed a Flask-based AI chatbot for student counseling and test analysis, leveraging agents and tools for dynamic response generation. Integrated session management, speech-to-text (STT) and text-to-speech (TTS) processing, and AWS S3 for audio storage. Designed the chatbot to provide personalized guidance on practice tests, optimizing student preparation and improving marks-per-minute efficiency.
- **Doubt Solver RAG Optimization :** Optimized a 5.5M-record dataset by implementing a 40% duplicate removal strategy and vectorization for efficient storage and retrieval in Pinecone. Designed and developed a Django-based Retrieval-Augmented Generation (RAG) system to enhance answer retrieval. Built a custom clustering pipeline leveraging FuzzyWuzzy, K-Means, and DBSCAN to identify duplicates, improving vectorization efficiency and reducing processing time from 1 day per 100K records to a significantly faster rate.
- **Tool wrapping for bioinformatic tools :** Streamlined bioinformatics tool integration by developing wrappers for selected tools, standardizing input/output parameters to ensure compatibility and accuracy, and incorporating them into a unified platform. Utilized Linux scripting to automate tool execution, manage data input, and handle result generation. Further enhanced the solution by containerizing these wrapped tools using Docker, ensuring portability, scalability, and seamless deployment.

### **BASESOLVE INFORMATICS - Software Developer ( SEP 2022 - Jan 2023 )**

**Bengaluru, India**

Built comprehensive web applications that cover frontend and backend aspects, facilitating bioinformatics tools. Additionally, designed and implemented a robust data analysis pipeline within the applications for processing genomic data.

- **Sample sheet Processor :** Applied OOP principles and used Jinja2 templates, CSS, and JS in conjunction with Flask backend to process genomic data sample sheets. Successfully extracted and displayed DNA sequence data in the output after processing.
- **EthSEQ Analysis :** An automated pipeline to run ancestor analysis which predicts closeness with people from different regions. Leveraged Docker and Singularity for containerization, encapsulating both R and Python scripts, establishing seamless connectivity where the Python script processed input, and its output seamlessly served as input for the subsequent R analysis within the container.

## **SKILLS**

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- Programming skills: Python, C, R, Linux  
Frontend - HTML,CSS,JavaScript  
Database - MySQL, MongoDB  
Backend - Flask, Django
- Machine learning - Predictive and clustering analysis, NLP
- Bioinformatics Skills - Genomic Data Analysis, Variant Calling, DNA Sequence Analysis, Clinical Genomics
- Generative AI - LLM, OPENAI API, Wolfram API, LangChain, Gemini AI
- Containerization & Version control : Docker & Singularity, Git
- Data Engineering - ETL, Feature Engineering, EDA, Data Modelling, Statistical analysis
- Libraries: Numpy, Pandas, Matplotlib, Scikit-Learn, Seaborn, pyVCF, NLTK, TensorFlow, json, pyDICOM, Huggingface, open route servicesAPI and Beautiful Soup
- AWS - EC2 instances
- Soft Skills - Research, Strategy making, Presentation, Communication and Problem solving

## **ACHIEVEMENTS**

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Winner of Analytics bootcamp 2023: Providing AWS solution for unified dashboard for optimizing medical devices sale-forecasting and performance proposal in Healthark Insights.

## **EDUCATION**

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### **MOUNT CARMEL COLLEGE**

*Master of Science in Biotechnology*

**Bengaluru,India**

**2020-2022**

- Percentage - 81.29%

### **BANGALORE UNIVERSITY**

*Bachelor of Science in Biotechnology*

**Bengaluru,India**

**2017-2020**

- Percentage - 78.04 %