Sanidhya Rana

+916261116108 sanidhyarana5@gmail.com Github Linkedin Portfolio

Education

Year	Degree/Exam	Institute	CGPA/Marks
2025	M.Tech	IIT Kharagpur	8.45 / 10
2023	B.Tech (Agricultural Engineering)	JNKVV, Jabalpur	7.96 / 10
2018	Senior School Certificate Examination	CBSE	72%
2016	High School Certification Examination	MPBSE (Madhya Pradesh)	76.67%

Professional Experience

Business Intelligence Intern — B.N. Agritech Ltd. (New Delhi) **May 2024 – July 2024**

Project: End-to-End Quality Control Appllication for Edible Oil Production

- **Architected** Flask/MySQL/Dash application monitoring **10,000+** production units, elevating quality metrics **30%** via real-time analytics
- Crafted custom **Power BI** dashboard delivering interactive actionable insights and performance visualizations across multiple facilities
- **Orchestrated** enterprise Azure cloud integration ensuring **99.9%** uptime with regulatory compliance, enhancing operational visibility

Projects

Multi-Agent Molecular Analysis AI Network **Jan 2025 – Jun 2025**

- **Architected** multi-agent AI system using **CrewAI** framework integrating **ESMFold** protein prediction and **RDKit** molecular docking.
- **Engineered 6** specialized CrewAI agents with hierarchical coordination processing molecular interactions and toxicity enhancement factors.
- Developed full-stack Streamlit application with real-time safety scoring analyzing **40+** food proteins and toxins for regulatory compliance.

Automated Degree of Milling Analysis Using Machine Vision (BIS Project), IIT Kharagpur **Nov 2024 – Apr 2025**

- **Engineered** rice milling analysis system for **60+** varieties across **15** states using computer vision and sensor data integration.
- **Implemented** multiple assessment methods achieving **R^2 of 0.92** through formula-based, whiteness, and RGB/Lux sensing approaches.
- **Achieved 79%** accuracy with CNN model trained on **2000** images across 4 classes, improving upon traditional inspection methods.

IoT-Based Robotic Pizza Automation System (M.Tech Project) Prof. Jayeeta Mitra, IIT Kharagpur **Aug 2024 – Apr 2025**

- **Engineered** a complete IoT ecosystem for automated pizza production combining robotic control, web interfaces, and processing nodes.
- Developed a Python-based interface integrating servo control, trajectory planning and real-time monitoring with web-based ordering system.
- Implemented **anti-wobble algorithms** and precise positioning control for the **4DOF** robotic arm to achieve consistent food handling.
- Created a **responsive web dashboard** with real-time status updates allowing customers to customize orders and monitor system operations.

Medical Interaction Checker: Advanced Drug Compatibility System **Nov 2024 – Jan 2025**

- Architected comprehensive medication analysis system using **RAG** and **Ollama LLM** models, identifying potential drug interactions.
- Engineered **Streamlit/ChromaDB** full-stack solution for real-time analysis of complex medication regimens and patient conditions.
- **Implemented** sophisticated information retrieval algorithms for analyzing interactions between multiple medications and health conditions.

NutriScore Predictor: AI-Powered Nutritional Analysis Tool (Term Project), IIT Kharagpur **Jan 2024 – Feb 2024**

- Developed interactive AI web application predicting nutrient scores with **85%** accuracy using Random Forest classifier models.
- Processed extensive dataset of **3.7M** OpenFood Facts records using PySpark/Pandas for accurate nutrient-score prediction in Flask app.
- **Deployed** highly scalable solution with rigorous **5-fold** cross-validation ensuring consistent accurate nutrient composition predictions.

Technical Skills

- **Machine Learning & AI:** Predictive Modeling, Statistical Analysis,Neural Networks, Time Series Forecasting, Natural Language Processing, Generative AI, Retrieval-Augmented Generation (RAG), Agentic AI
- **Programming & Development:** Python, JavaScript, SQL, HTML5, CSS3, Fast APIs, Flask, Streamlit
- **Databases & Data Engineering:** Microsoft SQL Server, MySQL, PostgreSQL, ChromaDB, PySpark
- **Libraries & Frameworks:** NumPy, Pandas, Scikit-Learn, TensorFlow, PyTorch, Keras, OpenCV, NLTK, Transformers, Langchain, CrewAI
- **Data Visualization:** Power BI, Tableau, Matplotlib, Seaborn, Plotly, Dash
- **Cloud & DevOps:** Microsoft Azure, Docker, Git, GitHub, Linux, CI/CD, AWS (basic)

Certifications

- Machine Learning in Production | DeepLearning.AI | Coursera
- Supervised Machine Learning: Regression and Classification | DeepLearning.AI | Coursera
- Machine Learning with Python | IBM | Coursera
- Large Language Models (LLMs) Concepts | Datacamp

Awards and Achievements

- Secured **All India Rank 32** in the Graduate Aptitude Test in Engineering (GATE) 2023.

Competitions

- **Flipkart GRiD 6.0:** Demonstrated coding and analytical skills.
- **Amazon ML Challenge:** Developed ML models for e-commerce categorization, achieving 82% accuracy.

Extracurricular Activities

- **Art of Living Workshop (Yes+):** Mastered breathing techniques and meditation, enhancing productivity and collaboration.
- **Personal Interests:** Competitive badminton, strategic gaming, and team competitions.