Devendra Dhakad

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Education

Year	Degree/Exam	Institute	CGPA/Marks
2026	M.Tech (Food Process Engineering)	IIT Kharagpur	8.07 / 10
2024	B.Tech (Agricultural Engineering)	JNKVV, Jabalpur	8.06 / 10
2019	Senior School Certificate Examination	MPBSE	72.8%
2017	High School Certification Examination	CBSE	8.0 / 10

Professional Experience

Artificial Intelligence Intern — CodeSoft   **Jul 2025 – Aug 2025**

Project: Mushroom Species Identification

- Developed a web app to classify **7** mushroom species and assess edibility. Scraped and processed **11,000** images to ensure accuracy.
- Implemented **CNN** models for image classification and integrated **GPT-2** to generate real-time descriptions to enhance user experience.
- Achieved **82%**, **80%**, and **80%** accuracy with **InceptionV3**, **DenseNet121**, and **Xception**. Deployed a Flask app for real-time classification.
- Delivered a user-friendly tool that enhanced mushroom identification and decision-making through AI-driven insights.

Projects

Detection of Starch in Milk Powder using ML (M.Tech Project) Prof. Ronit Mandal, IIT Kharagpur   **Aug 2025 – Present**

- **Designing** an image-based analysis system to study sessile drop evaporation patterns for detecting starch adulteration in milk
- **Developing** a Raspberry Pi–based image acquisition setup with controlled lighting, automated capture, and OpenCV preprocessing.
- Extracting handcrafted features (shape, texture, evaporation dynamics) and training classical ML models for adulteration classification.
- Implementing a real-time inference pipeline using optimized classical ML models for embedded food analysis systems.

Agentic RAG–Based Drug Compatibility System   **May 2025 – Jun 2025**

- Built an Agentic **RAG** framework with **LangGraph, Ollama** and **ChromaDB** to analyze drug–drug and drug–condition interactions.
- Engineered a planner–tool workflow supporting **multi-step retrieval**, validation, and knowledge synthesis for compatibility reports.
- Developed a **Streamlit** interface for real-time medication safety checks, generating structured outputs with risk levels and alternatives.
- Enhanced the reliability and robustness of healthcare AI by integrating reasoning steps and context-backed answers for safer clinical support.

Multimodal Knowledge Retrieval System (Course Project), IIT Kharagpur   **Mar 2025 – Apr 2025**

- Architected a multimodal **RAG** system capable of extracting and reasoning over text, images, and graphs from complex PDF documents.
- Applied **CLIP embeddings with FAISS** vector indexing to enable efficient cross-modal retrieval and semantic search across large documents.
- Integrated **LangChain with Google Gemini API** to generate precise, context-aware answers through advanced multimodal reasoning.
- Engineered a modular **Streamlit** interface enabling highly scalable, efficient real-time querying and document exploration.

Intelligent Nutritional Analysis AI Tool (Term Project), IIT Kharagpur   **Nov 2024 – Dec 2024**

- Designed an interactive AI web application that predicted nutrient scores with **85%** accuracy using Random Forest 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.
- Implemented multi-agent orchestration **(CrewAI, LangChain, FAISS)** for healthier recommendations and context-aware insights.

Technical Skills

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

Certifications

- Supervised Machine Learning: Regression and Classification | DeepLearning.AI | Coursera
- RAG using LangChain, LangGraph, and LangSmith | Udemy
- Excel Basics for Data Analysis | IBM | Coursera
- SQL for Data Science | UC Davis | Coursera
- Multi Agent AI System Workshop | Codingninjas
- Power BI Workshop | Office Master

Awards and Achievements

- Secured **All India Rank 53** in the Graduate Aptitude Test in Engineering (GATE) 2024.

Extracurricular Activities

- **Smart India Hackathon 2025:** Contribution as a volunteer.
- Actively participated in Illumination at IIT Kharagpur and represented the hostel through active involvement in volleyball.
- **Art of Living Workshop (Yes+):** Mastered breathing techniques and meditation, enhancing productivity and collaboration.
- Actively participated in various activities as a volunteer at the **NSS** unit including health camps & awareness campaigns.
- **Personal Interests:** Competitive badminton, strategic gaming, and team competitions.