Devanshu Singh

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Education

Indian Institute of Information Technology Bhagalpur **Aug 2023 – July 2027**

Bachelor of Technology in Mechatronics and Automation Engineering *Bhagalpur, Bihar*

Grade: *8.08 (latest), 8.01 (overall)*

Skills

Languages: C++, Python, JavaScript, CSS, HTML
Tools & Frameworks: Jupyter, Git, GitHub, TensorFlow, Keras, PyTorch
CS Fundamentals: Data Structures, Algorithms, OOPs
Domain: AI, Machine Learning, Deep Learning, Computer Vision, NLP, GenAI

Experience

Indian Institute of Technology Patna **Jun 2025 – Present**

ML Research Intern *Patna, Bihar*

- Working on the application of machine learning in quantum mechanics, focused on predicting magnon blockade phenomena using supervised learning techniques.
- Involved in feature engineering data from quantum simulations, and model development for identifying quantum statistical signatures.
- Gained hands-on experience with Python, Pytorch, Deep Learning and quantum theory concepts relevant to research.

Projects

Intelligent Crop Recommendation API | *LangChain, LLM, FastAPI, FAISS, Pydantic* | **Sep 2025**

- Developed a Retrieval-Augmented Generation (RAG) API using LangChain Expression Language (LCEL) and FastAPI to deliver contextual, location-specific crop advice for farmers in India.
- Engineered a parallel data retrieval pipeline to dynamically gather real-time weather and soil data from external APIs, integrated with static district-level agricultural statistics and a FAISS vector store for agro-climatic zone information.
- Implemented the Google Gemini model with a structured Pydantic output parser to ensure the final recommendations were delivered in a reliable, well-formed JSON format.

TB Detection and Infection Visualization | *Keras, CNN, Segmentation, Grad-CAM* | **Mar 2025**

- Implemented a U-Net segmentation model to extract lung regions from chest X-rays image, enhancing classification focus and accuracy.
- Developed a CNN-based classification model with a custom data generator for efficient pre-processing, augmentation, and batch-wise loading, utilizing pretrained models like DenseNet for improved TB detection.
- Achieved a validation dice-coefficient of 96.27% for the segmentation model and a validation accuracy of 98.21% for the classification model.

Comment Toxicity Predictor | *TensorFlow, Keras, NLP, BiLSTM* **Feb 2025**

- Developed a comment toxicity predictor model using BiLSTM and GloVe embedding to measure toxicity across 6 different classes, achieving 99.42% validation accuracy.
- Utilized Python and TensorFlow/Keras to develop a bidirectional LSTM-based deep learning model for multi-label text classification.

Achievements

- Finalist at multiple hackathons including hackathons at IIIT Gwalior, NIT Delhi.
- Completed the **Machine Learning Specialization** authorized by Stanford University and DeepLearning.AI (Andrew Ng).
- Completed the **Exploratory Data Analysis for Machine Learning** course with **honors** authorized by IBM.

Extracurricular

- **Unnati Welfare Society:** Treasurer of the NGO which provides education to more than 1000 underprivileged children of Bhagalpur.