UTKARSH SINGH

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EDUCATION

Degree/Certificate	Institution	Year
B-Tech	Mechanical Engineering, IIT (BHU), Varanasi	2025
HSC (XII)	Pace Junior Science College	2021
CBSE (X)	Seven Square Academy	2019

SKILLS

- **Languages And Tools:** Python, MySQL, C++, Jupyter Lab, Microsoft Excel, Google Workspace, Figma
- **Libraries:** PyTorch, fastai, Langchain, Transformers, Pandas, Matplotlib, Sk-Learn, NumPy, Streamlit, Quarto
- **Areas of Interest:** Deep Learning, Computer Vision, Multimodal Transformers, Natural Language Processing

WORK EXPERIENCE

Data Science Intern | Voiceback Analytics 🔗   May 2024 - July 2024

- Spearheaded **Promotion Analytics** for **Mumbai International Airport** arrival and departure duty-free stores.
- Developed a **pipeline** to extract transactional data, perform **feature engineering**, and **aggregate daily sales**.
- Trained ML models to uncover the most effective promotions driving **$960M** sales; achieving a **MAPE** of **0.13**.

PROJECTS

Skin Cancer Detection with 3D TBP | ISIC Challenge 2024 🔗

Identified cancers among skin lesions cropped from 3D total body photographs along with metadata

- Fine-tuned **Resnet-18** model and applied StratifiedGroupKFold to generate **Out-Of-Fold (OOF)** predictions.
- **Stacked** 3 gradient boosting models (**XGBoost, CatBoost** and **LightGBM)** with the OOF predictions obtained from the image only model; further combined these through **soft voting ensemble** for improved performance.
- Improved the **partial AUC-ROC** (above 80% TPR) to **0.167**; surpassing the standalone image model's **0.144.**

Natural Language Inference | Understanding Textual Entailment

- Developed an optimized data pipeline to clean and **tokenize multilingual** text inputs for effective processing.
- Fine-tuned **XLM-RoBERTa** to classify a hypothesis as entailment, contradiction, or neutral based on premise.
- Conducted comprehensive evaluation to refine semantic reasoning capabilities, achieving over **86%** accuracy.

Question Answering Chatbot with Retrieval Augmented Generation 🔗

- Implemented **RAG** with a PDF knowledge base and robust guardrails to mitigate llm response hallucinations.
- Developed an interactive **Streamlit interface**, providing a smooth question-answering experience for users.
- Exposure: Langchain components: document loaders, text splitters, database store, retriever, prompts, llms.

Entity Extraction from Images | Amazon ML Challenge 2024 🔗

Applied machine learning models to extract precise product information directly from retail images

- Built an **OCR pipeline** for image loading, **grayscaling** and **binarization**, and text extraction through EasyOCR.
- Leveraged regular expression matching to efficiently parse and extract entities from the OCR-processed data.
- Secured top **500** ranking on a highly competitive leaderboard, outperforming **75,000+** nationwide participants.

CERTIFIED COURSES

- **Online Courses:** Generative AI with LLMs (AWS), Practical Deep Learning for Coders (Jeremy Howard, Fastai), Deep Learning Specialization (Andrew Ng), Machine Learning Specialization (Andrew Ng, Stanford).
- **Academic Courses:** Probability and Statistics (MA-202), Artificial Intelligence (EC-422).

POSITION OF RESPONSIBILITY

Senior Executive | Student Alumni Interaction Cell, IIT (BHU)   January 2022 - May 2025

- Evaluated and processed the data of **600+ alumni** who volunteered as mentors for a cohort of **750 students**.
- Boosted the Alumni Portal registrations among **1000+** graduating students by facilitating the **Convocation'22.**
- Coordinator for **EV Ecosystem Conclave,** organised by AIBA and PanIIT Alumni, hosting **450+ participants.**

EXTRA-CURRICULAR ACTIVITIES

- Achieved **1st place** in Freshers on Board'21, an intra freshers' chess tournament, surpassing **100+** players.
- **3rd place** in the inter-college chess competition, representing IIT(BHU) in Spardha'23 amongst **15+ colleges**.
- Represented the Republic of South Africa as their **delegate** in the **UNCSW** committee of IITBHU MUN 2022.