

Kumar Ritik

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Professional Summary

Aspiring Machine Learning Engineer skilled in developing machine learning models for computer vision, natural language processing, and predictive analytics using Convolutional Neural Networks (CNNs), Long Short-Term Memory (LSTM) models, and Transformers. Proficient in Python, C++, SQL with strong foundation in Data Structures, Algorithms, Operating Systems, Computer Networks, and Database Management Systems.

Education

Vellore Institute of Technology, Bhopal B.Tech in Computer Science and Engineering, Cumulative GPA: 8.22/10	Sept 2022 – Present
Ishan International Public School, Patna Class XII, 74.6%	May 2021
Ishan International Public School, Patna Class X, 92.0%	May 2019

Publications

Alzheimer's Disease Detection Using Convolutional Neural Networks (CNNs) Submitted to Springer.	In Process
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Projects

Image Captioning and Segmentation • Implemented a deep learning system with ResNet50 and LSTM for captioning and Mask R-CNN for segmentation on MS COCO 2017, achieving BLEU-4 score of 0.35 and IoU of 0.75. • Optimized NLTK preprocessing and PyTorch data loaders, reducing training loss to 2.32 over 3 epochs. • Deployed a Streamlit app for real-time captioning and segmentation visualization. • Tech: Python, PyTorch, ResNet50, Mask R-CNN, NLTK, Streamlit, Matplotlib, COCO API.	Mar 2025 – Jun 2025
Alzheimer's Disease Detection • Engineered a convolutional neural network using InceptionV3 to classify Alzheimer's stages from 6,400 brain MRI images in a 4-class Kaggle dataset and achieving 94.84% accuracy. • Optimized data pre-processing pipeline using grayscale conversion and noise reduction, reducing training time by 20%. • Applied SMOTE for class balancing and data augmentation (zoom, flip) to enhance model robustness on imbalanced medical data. • Tech: Python, TensorFlow, Keras, Scikit-Learn, OpenCV, SMOTE, Matplotlib, Seaborn.	Aug 2023 – Nov 2023
Sentiment Preservation Analysis • Developed an NLP pipeline using XLM-RoBERTa to classify sentiment in 5,000 English-Hindi sentence pairs from a 1.66M-pair IITB dataset, achieving 71.40% accuracy. • Evaluated sentiment preservation, attaining 63.26% accuracy for consistent sentiment between English and Hindi translations on a 2,507-sample test set. • Implemented robust evaluation with a 0.72 weighted F1-score and confusion matrices, enhancing model performance analysis using Scikit-learn. • Improved interpretability by 20% through visualizing sentiment distributions and confusion matrices with Seaborn and Matplotlib. • Tech: Python, XLM-RoBERTa, Scikit-Learn, Pandas, NumPy, Matplotlib, Seaborn.	Nov 2024 – Feb 2025

Technical Skills

- **Programming Languages:** Python, C++, SQL
- **Problem Solving:** Solved over 130 problems on LeetCode.
- **Data Science Tools:** Pandas, NumPy, Matplotlib, Seaborn, Power BI, Tableau, Dataiku
- **Machine Learning:** TensorFlow, Keras, Pytorch, Scikit-Learn Convolutional Neural Networks (CNNs), Long Short-Term Memory (LSTM), Transformers, Natural Language Processing (NLP), Streamlit
- **Computer Vision:** OpenCV, YOLO, Mask R-CNN, Object Detection
- **Databases:** MySQL, SQLite, Oracle

Certifications

- Coursera: Applied Machine Learning in Python
- iamneo: Data Science using Python
- Dataiku: Machine Learning Practitioner, Generative AI Fundamentals

Achievements

- KSP Data-thon 2024 Semi-finalist.
- Completed Deloitte Data Analytics Job Simulation 2025, applying Tableau and Excel for solving real-world tasks.