Ishita Raj

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UNDERGRADUATE STUDENT

EDUCATION

BITS PILANI | B.E Electrical and Electronics + MSc. Maths
2021 – 2026 | Hyderabad, Telangana

DELHI PUBLIC SCHOOL | Class XII
2021 | Ranchi, Jharkhand

TECHNICAL SKILLS

- Python, Kotlin, C
- Mountainsort5, SpikeInterface, NumPy, scikit-learn, PyTorch
- ARIMA, SciPy, Statsmodels
- OpenCV, Tesseract

RESEARCH / PROJECTS

PC ANALYSIS OF ELECTROPHYSIOLOGICAL DATA USING MOUNTAINSORT5 | Project under Prof. Srinivasa Prasad, Pharmacy Department, BITS Pilani
2024 | Hyderabad, Telangana

- Developed a data science pipeline to analyze electrophysiological data from 24 brain activity channels, utilizing spike sorting to filter noise and extract accurate spikes with associated timestamps.
- Tools used: Mountainsort5, SpikeInterface, NumPy, scikit-learn.

OPEN INFORMATION EXTRACTION AND WORD2VEC MODEL IMPLEMENTATION | Project under Prof. Prajna Devi Upadhyay, CSIS Department, BITS Pilani
2024 | Hyderabad, Telangana

- Developed a Supervised Model for Open Information Extraction (Open IE), converting sentences into structured tuples (<subject, relation, object, time, location>) and evaluated its accuracy using the CaRB metric.
- Implemented Word2Vec algorithms (Skip-Gram and CBOW) from scratch with softmax and negative sampling, and assessed model quality using the Mean Reciprocal Rank (MRR) on the wikitext-103 dataset.
- Tools used: Python, NLP, Supervised Learning, Sequence Labeling, CaRB metric, Skip-Gram, CBOW, Softmax, Negative Sampling.

ANALYSIS AND IMPLEMENTATION OF GEOFFREY HINTON'S FORWARD-FORWARD ALGORITHM | Project under Prof. Paresh Saxena, CSIS Department, BITS Pilani
2024 | Hyderabad, Telangana

- Analyzed and implemented Hinton's Forward-Forward algorithm on the MNIST dataset, achieving a train error of 0.06 and a test error of 0.07.
- Explored the effects of hyperparameter changes and activation functions on model performance.
- Tools used: Python, PyTorch.

TIME SERIES ANALYSIS AND PREDICTION OF DAILY MAXIMUM TEMPERATURE USING ARIMA | Project under Prof. Akanksha Rathore, CSIS Department, BITS Pilani
2024 | Hyderabad, Telangana

- Developed ARIMA models for predicting daily max temperatures, improving MAE from 4 to less than 2 by training on 27 days of data.
- Tools used: Python, Pandas, ARIMA, SciPy, Statsmodels.

SUDOKU SOLVER | Independent Project
2023

- Engineered a Sudoku Solver algorithm in Python, with functions for finding empty locations and checking the validity of placements.
- Tools used: Backtracking algorithm.

CHARACTER RECOGNITION IN IMAGES | Independent Project
2023

- Developed a high-accuracy text recognition script using Python, OpenCV, and Tesseract OCR, achieving 95% accuracy in extracting text from complex image datasets.
- Tools used: OpenCV, Tesseract.

ANALYSIS OF SPOTIFY'S HYBRID SERVER ARCHITECTURE AND APPLICATION OF QUEUING MODELS IN IMPROVING USER SATISFACTION | Independent Project
2023

- Conducted in-depth sensitivity analysis on Spotify's hybrid server architecture, identifying key parameters that optimized user satisfaction and reduced latency by 10%.
- Tools used: Python, Queuing Models.

TIC TAC TOE GAME | Independent Project
2023

- Developed an interactive Tic-Tac-Toe game in Python, integrating advanced game logic and enhanced user interface, leading to a more engaging user experience.
- Tools used: Python.

EXPERIENCE

BHASKARACHARYA NATIONAL INSTITUTE FOR SPACE APPLICATIONS AND GEO-INFORMATICS | Research Intern
May 2023 – June 2023 | Gandhinagar, Gujarat

- Developed and implemented data visualization techniques for multi-altitude weather data using box plots, histograms, and heatmaps to enhance analysis accuracy.
- Leveraged Pandas, NumPy, Geopandas, Seaborn, Basemap, and Cesium.js to create dynamic and interactive visualizations, facilitating real-time weather pattern analysis.

BITS PILANI HYDERABAD CAMPUS | Student Coordinator, Admissions Division
Apr 2023 – Apr 2024 | Hyderabad, Telangana

- Streamlined the document verification and onboarding process for 1200+ freshmen, ensuring 100% compliance and reducing processing time by 20%.
- Led and coordinated a team of 90+ volunteers, successfully optimizing the admission process for 1200+ students, resulting in a 15% increase in efficiency.

RELEVANT COURSES

- Control Systems
- Machine Learning
- Natural Language Processing
- Optimization
- Operations Research

INTERESTS

- Machine Learning
- Natural Language Processing
- Bio-electronics