HARTHIK MANICHANDRA VANUMU

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• https://portfolio-website1-harthik-s-projects.vercel.app/

Education

Manipal Institute of Technology (MIT) Bengaluru
B.Tech in Computer Science and Engineering (Artificial Intelligence) 07/2023 - 07/2027

Experience

IEEE Computer Society Bangalore Chapter
Student Intern (Team Lead) 07/2025 - Present

Project: Agentic LLM for Interpretable SHAP Explanations in Financial Fraud Detection
Status: Development ongoing (project parameters subject to continuous optimization)

- Leading cross-functional team in developing AI-powered financial fraud detection framework, coordinating research paper development for academic publication
- Developing end-to-end fraud detection system using LightGBM on IEEE-CIS financial dataset with comprehensive data preprocessing, feature engineering, and systematic hyperparameter tuning using AutoGluon framework
- Implementing explainable AI framework using SHAP for model interpretability, generating global feature importance analysis and local explanations for fraud prediction decisions
- Implementing LLM-based summarization agent that takes SHAP feature contributions as input and produces contextual explanations of fraud prediction decisions

Key Achievements

1st Place, RoboRun Competition & TechTatva Selection 09/2024 - 10/2024

- Won MAHE Bengaluru's university-wide 'RoboRun' line follower robotics competition (1st Place).
- Subsequently, selected for the official, institutionally-funded MIT-Bengaluru team at TechTatva (MIT-Manipal's technical fest).

Publications

https://drive.google.com/file/d/1eJhg5IIRiEeU_LZiy1-3y1fV2URa21oX/view 10/2024 - 05/2025
A Machine Learning Framework for Data-Scarce Regression using SMOGN with Joint Hyperparameter Optimization: A Case Study with Cricket Performance Prediction

Status: Manuscript Completed and Submitted for Review

Skills and Competencies

Programming Languages: Python · Java · C

Data Analysis & Visualisation: Data Analytics · Statistical Analysis · Pandas · NumPy · Seaborn · Matplotlib

Machine Learning & AI:
Machine Learning Model Development & Evaluation · Feature Engineering · Data Augmentation (SMOGN) · Regression · Ensemble Learning · Scikit-Learn

Databases: SQLAlchemy · MySQL

Web Development & Automation: Flask · HTML · CSS · Jinja2 · Selenium · BeautifulSoup4 · Requests

Tools: Jupyter · VS Code · Git/GitHub · Excel

Projects

Predictive Modelling & Data Augmentation for Cricket Analytics 10/2024 - 05/2025

- Developed and rigorously validated a complete machine learning pipeline for predictive modeling in niche sports analytics (WPL cricket), specifically addressing challenges of sparse datasets.
- Applied data augmentation techniques (SMOGN) and robust feature engineering to improve prediction accuracy for season-long batting performance.
- Authored a research paper detailing the methodology and findings, collaborating with faculty from the IT and Physical Education & Sports departments (MIT-Bengaluru), and received guidance from a professor at Sunway University, Malaysia.
- Evaluated diverse regression models (Gradient Boosting, XGBoost, etc.) using multi-seed cross-validation, demonstrating strong predictive performance.
- Created an automated Python CLI tool for efficient data scraping (from cricsheet.org) and preprocessing, preparing data for the modeling pipeline.

RBI NEFT Data Analysis and Visualization Platform 04/2025 - 04/2025

- Developed a Flask web application allowing users to filter, query, analyze, and visualize large-scale RBI NEFT transaction datasets spanning multiple years (2016-Present) and numerous participating banks.
- Engineered an end-to-end data pipeline: automated web scraping (Selenium, BeautifulSoup) to fetch RBI data links, downloaded Excel files (Requests), processed data (Pandas), and stored structured data in a MySQL database (SQLAlchemy, PyMySQL).
- Implemented server-side data analysis (Pandas, SQLAlchemy) and generated dynamic visualizations (Matplotlib) of transaction trends (monthly volume/value) and bank rankings (top 10 by count/amount).
- Created interactive frontend views using HTML, CSS, and Jinja2 templating to display filtered data tables and generated graphs.

Personal Portfolio Website 05/2025 - Present

- Engineered a dynamic and responsive personal portfolio website leveraging Next.js, React, TypeScript, and Tailwind CSS to effectively showcase technical projects, skills (AI/ML, Data Science, Software Engineering), and professional background. Implemented key features including interactive project displays, and a skills section. Successfully deployed on Vercel, demonstrating proficiency in modern web development practices and UI/UX principles.