Gautam Bulusu

College Park, MD gbulusu@umd.edu +1 240 791 99 49 LinkedIn My Portfolio

Professional Summary

ML engineer with production experience deploying scalable solutions in finance, healthcare, and robotics. At Reliance, automated workflows saving 6,250 employee-hours annually and reduced reporting cycles by 80%. Developed explainable AI systems for medical imaging (92% accuracy) and quantitative finance (35% Sharpe improvement). Seeking summer 2026 internship to apply ML expertise in high-impact domains.

Education

University of Maryland, College Park *Sep 2025 – May 2027*
Master's in **Applied Machine Learning - CGPA: 3.7/4**
Relevant Coursework: Probability and Statistics, Principles of Machine Learning, Principles of Data Science, Optimization, Computing Systems, Data Structures and Algorithms

KJ Somaiya College of Engineering, Mumbai *Sep 2020 – May 2024*
Bachelor's of Technology in **Information Technology - CGPA: 8.54/10.00**
Relevant Coursework: Data Structures, Algorithms, Advanced Databases, Deep Learning and Fuzzy Logic, Cloud Computing, Exploratory Data Analysis, Information Retrieval, Probability, Statistics & Optimization Techniques, Operating Systems, Object Oriented Software Engineering

Skills

- **Programming Languages**: Python, SQL, C++, C, Java, R, JavaScript, MATLAB, PHP
- **Machine Learning & AI**: PyTorch, TensorFlow, scikit-learn, XGBoost, Random Forest, Deep Learning, Transfer Learning, Computer Vision, Natural Language Processing, FinBERT, SHAP, OpenCV, YOLOv5, CNN, SVR
- **Cloud & DevOps**: Amazon Web Services (AWS), Microsoft Azure, Google Cloud Platform (GCP), Docker, CI/CD, Azure App Services
- **Data Science**: pandas, numpy, Feature Engineering, Time Series Analysis, Statistical Modeling, ETL, Data Pipelines, Backtesting, SciPy
- **Visualization & BI**: Tableau, Power BI, Matplotlib, Seaborn, Streamlit, Plotly, Interactive Dashboards
- **Databases**: SQL, MySQL, PostgreSQL, NoSQL
- **Software Development**: Git, GitHub, Agile, REST APIs, Microservices, Version Control, API Integration
- **Robotics & Embedded**: ROS, Arduino, Raspberry Pi, Jetson Nano, Embedded C/C++, SLAM, Path Planning, Computer Vision
- **Geospatial & Remote Sensing**: Google Earth Engine, Satellite Imaging, Spatial Analysis

Work Experience

Reliance Brands Limited, Mumbai *Jul 2024 – Mar 2025*
Software Engineer Intern

- **Built** an end-to-end Python + Streamlit financial analysis platform, replacing legacy Excel workflows and **reducing processing time by 80% (weeks → days)** for cross-functional teams across **71 international brands**.
- **Automated** Tableau reporting with Python scripts (login, navigation, filtering, downloads), **saving ∼6,250 employee-hours annually** by eliminating repetitive daily tasks for **25 analysts**.
- **Optimized** the firm's "**Waterfall Process**" by integrating data pipelines into in-app dashboards (**Store P&L, IRR, Payback, Cashflow, PERT**), delivering **real-time insights** to stakeholders including the **CFO and CEO**.
- **Deployed** applications on **Azure App Services**, ensuring enterprise-grade scalability, reliability, and security.

Internships

Jio Institute, Navi Mumbai *Jun 2023 – Sep 2023*
Computer Vision Intern

- Leveraged **Meta's Segment Anything Model (SAM)** with a **weakly supervised training pipeline** to segment vertebrae in **3D/4D CT scans**, reducing reliance on fully annotated datasets by **∼60%**.
- Engineered an **automated pipeline** to extract vertebrae centroids and compute **Cobb angles** for scoliosis assessment, achieving **92% accuracy** compared to radiologists.
- Processed and analyzed **374 4D CT scans** from the **VerSe 2019–2020 Grand Challenge** dataset.
- **Accelerated** clinical workflows by **30%**, showcasing the potential of AI-assisted diagnosis in orthopedic imaging.

Notable Academic Projects

Market Regime Detection Using Financial Sentiment and Technical Indicators *Sep 2025 – Dec 2025*
University of Maryland, College Park

- **Developed** a stacking ensemble (Random Forest + XGBoost) integrating FinBERT-extracted news sentiment with technical indicators to classify S&P 500 regimes, achieving **67.8% accuracy** and **+35% Sharpe ratio** improvement over buy-and-hold.
- **Engineered** 60+ features (price/volatility signals, sentiment lags, interactions) and conducted SHAP analysis, showing sentiment contributed **44%** of predictive power and provided 5–10 day advance warning for market stress.
- **Backtested** dynamic asset allocation strategies, demonstrating a **26% reduction in volatility** and **29% lower drawdowns**, validated over 10 years and 2,500+ trading days.
- **Implemented** research infrastructure in Python (scikit-learn, XGBoost, FinBERT, SHAP, pandas), enabling automated feature generation, regime modeling, explainability, and institutional-grade backtesting.

Weather & Human Behavior Analysis *Sep 2025 – Dec 2025*
University of Maryland, College Park

- **Analyzed** 4,870 observations across 974 days linking weather conditions to human mobility patterns across 5 U.S. states using Google Mobility data and Open-Meteo weather API, identifying an optimal temperature range of 15–25°C for peak human sentiment.
- **Developed** Random Forest regression model achieving **53% R^2 score** in predicting sentiment variance, with month/season emerging as the strongest predictor (**44.4% feature importance**) over weather variables.
- **Discovered** storm impact on mobility reduced parks visits by **104.5%**, retail by **16.1%**, and workplace by **6.5%**, while cold weather (<5°C) decreased sentiment by **181%** compared to moderate temperatures.
- **Built** comprehensive data pipeline integrating APIs, statistical testing (SciPy), and interactive visualizations (Matplotlib, Seaborn) with results published on **GitHub Pages**.

Leadership & Awards

Team KJSCE Robocon – Vice-Captain and Software Lead *Aug 2022 – Jun 2023*

- Mentored **40+ juniors** on data structures, embedded systems, and computer vision for robotics applications.
- Integrated **Kinect sensor on Jetson Nano** for real-time arena mapping and autonomous robot navigation using ROS.

Team KJSCE Robocon – Coding Team Member *Sep 2021 – Aug 2022*

- Implemented **Dijkstra's algorithm** for optimal path planning, **reducing competition round time by 3 seconds**.
- Fine-tuned **YOLOv5 on 1,200 images** and deployed on Raspberry Pi for real-time object detection at 15 FPS.
- **Achieved 6th place nationally** at ABU Robocon 2022 (IIT Delhi) – team's highest rank in competition history.

Community Engagement

- Judge at **World Robot Olympiad West India Regional Championship 2022**, evaluating 50+ robot performances against international standards.
- Designed and delivered **2-day robotics workshop for 80 students**, teaching fundamentals through hands-on soccer robot build with phone-controlled navigation.

Certifications

- **Deep Learning and Reinforcement Learning Specialization** – Coursera, Jul 2024
- **Mathematics for Machine Learning Specialization** – Coursera, Jan 2023
- **Data Structures Specialization** – Coursera, Jan 2023
- **Databases and SQL for Data Science with Python** – Coursera, Aug 2022