RUTH BALAJI

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EDUCATION

Masters in Intelligent System Engineering | Indiana University Bloomington, USA | GPA: 3.46/4 Aug 2023 – May 2025
Courses: Applied Machine Learning, Computer Networks, Data Visualization, Scientific Visualization, Information Visualization.
Bachelor of Engineering in Electronics and Communication | Sathyabama University | GPA: 8.7/10 Jun 2019 – May 2023
Courses: Programming in C and C++, Data Structures, IoT, Artificial Intelligence.

TECHNICAL SKILLS

- **Programming Languages and Technologies:** Java, JavaScript, MySQL, NoSQL, Pandas, PostgreSQL, Python (NumPy, Pandas, PyTorch, Scikit-learn, TensorFlow, XGBoost), R, React, SQL, T-SQL.
- **Skills:** A/B Testing, AI/Machine Learning (Classification, Clustering, Feature Engineering, Reinforcement Learning, Supervised, Transfer Learning, Unsupervised), HuggingFace, Keras, OpenCV, Recommendation System, Transformers.
- **Data Applications:** Airflow, Spark, Databricks, DBT, Informatica, Kafka, Looker, PySpark, QuickSight, Tableau, Talend.
- **Data:** BigQuery, DynamoDB, Elasticsearch, JSON, MongoDB, Redis, Redshift, Snowflake, XML.
- **Tools:** AWS, Azure, Bitbucket, Docker, Django, Flask, GCP, GIT, Gephi, JIRA, Kafka, Kubernetes, PowerBI.

PROFESSIONAL EXPERIENCES

Research Assistant **May 2024 - Present**
Indiana University | *Data Analysis, Machine Learning, Python* **Bloomington, IN**
- Designed a data-driven TPU architecture using Python and Verilog within the Xilinx Vivado environment, enhancing computational efficiency by 40% through optimized machine learning computations and statistical modeling.
- Led data analysis and testing for FPGA implementations, performing statistical verification and model synthesis, resulting in a 25% reduction in computational power consumption and a 15% improvement in simulation accuracy.
- Streamlined design processes with automated data analytics to reduce design time by 35%, enhancing predictive reliability.

Data Science Intern **Jun 2022 – Sep 2022**
Annai Clinic | *Forecasting, Computer Vision, Data Analysis, Python, TensorFlow* **Chennai, India**
- Developed AI models using Convolutional Neural Networks (CNNs) and OpenCV to analyze Alzheimer's patient behavior, improving patient engagement by 25% through predictive insights and forecasting models.
- Utilized Python and TensorFlow for data preprocessing, model training, and deployment, achieving an accuracy of 88%, reducing processing time by 20%, and enhancing data accessibility by 30%.

Data Analytics Intern **Sep 2021 – Dec 2021**
Appasamy Ocular Devices | *Data Modeling, Predictive Analytics, Predictive Modeling Statistical Analysis* **Puducherry, India**
- Conducted data-driven diagnostics and performance analysis for embedded systems, reducing downtime by 35% and increasing productivity by 40% through advanced data analysis, predictive maintenance, and statistical debugging methods.
- Built predictive analytics models for embedded platforms, achieving $20,000 in annual savings, reducing power consumption by 30%, and enhancing system efficiency through data analysis and machine learning techniques.

PROJECTS

Optimizing Healthcare Resource Allocation through Visual Analytics | *Time Series, Network analysis, Python*
- Leveraged data-driven insights to improve patient care by 40%, staff satisfaction by 50%, and achieve 35% cost savings through optimized staff allocation and resource management, significantly enhancing overall patient flow.
- Utilized time series and network analysis with visualizations (line charts, heat maps, network diagrams) to reduce patient wait times by 60%, achieve 95% balanced resource utilization, and boost operational efficiency by 45%.

Detection of Credit Card Transactions Fraud | *AWS, Exploratory Data Analysis, Integration Testing, Jupyter, Unit Testing*
- Engineered fraud detection dashboard using Jupyter, implementing EDA and SMOTE to enhance model performance to transform data, ensuring data quality using various metrics to attain a precision of 0.72 through unit and integration tests.

City of Manhattan, KS Housing Dashboard | *Data visualization, Dashboard, Gephi, PowerBI, Python, Tableau*
- Developed housing dashboard for Manhattan, KS using Python, Power BI, and Gephi enhancing affordability analysis by 50% and improving availability tracking by 45%, contributing to more efficient local decision-making.
- Created interactive visualizations for demographic analysis in Tableau to highlight housing trends, resulting in a 60% increase in informed decisions and a 55% improvement in public awareness of housing affordability.

Comic Routine Analysis Using NLP Techniques | *Data Analysis, GPT, LSTM, NLP, Machine Learning, Python.*
- Analyzed over 1,000 stand-up routines using web scraping, statistical analysis, and sentiment analysis, achieving 85% accuracy in classifying audience reactions and identifying key comedic delivery and timing patterns.
- Enhanced text generation models (GPT, LSTM) to create original stand-up scripts, leading to a 40% improvement in audience engagement predictability, showcasing advanced applications of Natural Language Processing in content creation.

CERTIFICATIONS & ACHIEVEMENTS

- HTOP Solutions certification on **Python** May 2023'.
- Mind Luster online certification on **Data Visualization models in PowerBI**.
- Google Cloud Certificates: **Transformer Models and BERT** | **Responsible AI** | **Large Language Models** | **Generative AI**.
- Authored a paper on "Self-Learning Based Training Device for People with Alzheimer's and Visually Challenged."