

# RAHUL VINAY

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St Louis, USA

## EDUCATION

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### Master of Science (M.S.) in Computer Science

Missouri University of Science and Technology | Rolla, USA | Jan 2023 - Dec 2024

- GPA: 3.7
- Relevant Coursework: Machine Learning for Computer Vision, Introduction to Deep Learning, Advanced Artificial Intelligence, Probability, Analysis of Algorithms.

### Bachelor of Technology (B.Tech.) in Electronics and Communication Engineering

PES University | Bangalore, India | Aug 2018 - Sep 2022

- Relevant Coursework: Artificial Neural Networks, Pattern Classification, Advanced Digital Image Processing, Introduction to Artificial Intelligence, Computer Networks

## SKILLS

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- **Programming:** : Python (pandas, NumPy, scikit-learn, PyTorch, TensorFlow, OpenCV), C# (GUI, ScottPlot), R, C, MATLAB
- **Machine Learning & GenAI:** GenAI libraries (LangChain), TensorFlow, Scikit-learn, Deep Learning, LLMs
- **Database Management:** SQL (MySQL, PostgreSQL, SQLite), Query Optimization, Data Modeling
- **Data Processing:** Exploratory Data Analysis, Shell Scripting (Linux/Unix)
- **Data Visualization:** Tableau, Seaborn, Matplotlib, ScottPlot
- **Tools:** Visual Studio, Git, Jupyter, Streamlit, AWS

## PROFESSIONAL EXPERIENCE

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### DuPont - Spectrum Plastics Group

Software Engineer Co-op | Hermann, USA | May 2024 - present

- Developed **GUI-based data visualization tools** in **C#** and **Python**, accelerating analysis speed by 30% for laser drilling operations.
- Built intuitive **data retrieval** and **automation solutions** in **C#** with **SQLite**, enhancing decision-making speed and reliability.
- Optimized spiral path generation using **Google OR-Tools** and **Machine learning**, cutting production time by 10%.
- Implemented advanced **custom algorithms** in **Python** and **C#** for high-precision drilling, significantly boosting workflow accuracy and consistency.

### DRDO - Center for Artificial Intelligence and Robotics

Natural Language Processing Intern | Bangalore, India | Feb 2022 - May 2022

- Implemented the 'Snowball Relation Extraction' model in **Python**, achieving 87% accuracy in **extracting relationships** from **large unstructured text data**.
- Optimized Machine learning models on 10,000+ text records through **data analysis** and **hyperparameter tuning**, achieving a peak F1 score of 75% using **Python libraries (spaCy, NLTK)**.
- Enhanced data preprocessing with **Named Entity Recognition (NER)** and **coreference resolution**, increasing model consistency and efficiency in handling complex text datasets.
- Elevated model accuracy by 20% through **10-fold cross-validation** and **iterative fine-tuning**, yielding more reliable and precise NLP predictions.

## PROJECTS

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### Sentiment Lens - Sentiment Analysis with Bidirectional LSTM and Attention

- Achieved 87.94% accuracy on the IMDB movie reviews dataset using a **sentiment analysis model** with **Bidirectional LSTM, Attention Mechanism, and GloVe embeddings**.
- Enhanced model focus on critical text portions through an **Attention Mechanism**, improving sentiment classification accuracy.
- Processed 50,000 reviews and developed a **deep learning architecture** with **Keras**, with plans to explore **transformer models (BERT, GPT)** for future performance improvements.

### Developer Salary Insights

- Developed an **ML-based salary prediction model** using **Python, Scikit-learn**, and **Streamlit** with **Stack Overflow Developer Survey 2023** data.
- Built end-to-end **data pipelines** for salary prediction, leveraging **pandas, NumPy and matplotlib** for data processing and visualization.
- Created interactive insights and visualizations using **Streamlit, machine learning** and **data analytics** to explore salary trends by country, education, and experience.

### Flask Weather App

- Built a **Flask web application** that integrates with the **OpenWeatherMap API** to retrieve and display real-time weather data, offering an accessible interface for adding and managing city weather details.
- Implemented **SQLAlchemy** with **SQLite** for robust database management, enabling efficient data storage and retrieval for user-added cities within the app.
- Developed **interactive front-end** features using **HTML, CSS, and Bulma** to ensure a responsive **user experience** and seamless data presentation.

### COVID-19 Database Management System

- Designed a **PostgreSQL-based DBMS** for COVID-19 impact analysis, tracking cases, hospital availability, and vaccine distribution.
- Formulated **complex SQL queries** to support critical **data analysis** on treatment availability and resource allocation, enabling real-time access to actionable insights for healthcare management.
- Employed **data modeling** techniques to design **ER and relational schemas**, optimizing **database performance** and ensuring efficient **data retrieval**.

### Real-time Driver Drowsiness Detection and Safety Alerts System

- Built a **Python-based machine learning model** using facial landmarks algorithm (EAR, MAR) with **OpenCV and Dlib**, achieving 95% accuracy in detecting driver drowsiness and fatigue.
- Integrated safety alert mechanisms on a **Raspberry Pi** using **Embedded C**, providing immediate buzzer and SMS notifications to enhance driver safety.
- Streamlined machine learning workflows through **data preprocessing, image processing, feature extraction** to enhance driver safety.

## CERTIFICATES

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- Google Data Analytics Professional Certification, July 2023
- Fundamentals of Deep Learning - NVIDIA DLI, Oct 2023
- Deep learning using Medical Data - Finland Labs, 2021