Bandlapalli Roshan Babu

AI,ML Engineer | Quantum ML Researcher | Qiskit Advocate 2025

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Hyderabad, India

Professional Summary

M.Tech student in Artificial Intelligence & Data Science at Mahindra University with expertise in **Deep Learning**, **Natural Language Processing**, and **Quantum Machine Learning**. Currently pioneering the development of a novel **Quantum-Classical Facial Biometric System** at Lloyd's Bank Research. Selected as an **IBM Qiskit Advocate (2025)** and active **Perplexity Campus Ambassador**. Published researcher with strong foundations in end-to-end AI application development, hybrid quantum-classical pipelines, and scalable ML deployment. Proven leadership as University Throwball Club Captain and international sports representative for India.

Education

Mahindra University, Hyderabad Aug 2024 – Present
M.Tech in Artificial Intelligence & Data Science **CGPA: 7.38/10.0**

Specialization: AI, Data Science, Quantum Machine Learning
Coursework: Deep Learning, NLP, Quantum Computing, Business Intelligence
Achievement: Merit-Based Scholarship for Academic Excellence

Presidency University, Bangalore Jun 2020 – May 2024
B.Tech in Computer Science & Engineering (AI & ML) **CGPA: 8.51/10.0**

Coursework: Artificial Intelligence, Machine Learning, Quantum Computing, Cloud Technologies
Achievement: Graduated with Distinction

Sri Chaitanya Junior College, Vijayawada Aug 2018 – Jun 2020
12th Standard – MPC (Mathematics, Physics, Chemistry) **CGPA: 8.69/10.0**

Rishi Vidya Niketan High School,Pulivendula June 2017 – Mar 2018
10th Standard – SSC **CGPA: 9.7/10.0**

Technical Skills

Programming Languages	Python, Java, SQL, JavaScript, HTML5, CSS3
AI/ML Frameworks	PyTorch, TensorFlow, Keras, Scikit-learn, Pandas, NumPy
Deep Learning	CNNs, RNNs, LSTMs, BiLSTM, Autoencoders, GANs, VAEs, YOLO, Transformers
Natural Language Processing	Tokenization, Sentiment Analysis, GloVe, Word2Vec, Attention Mechanisms, BERT, GPT, LangChain, LangGraph
Quantum Computing	Qiskit, Quantum Circuits, QASM Simulator, VQCs, QCNN, QSVM, Hybrid Quantum-Classical Models, IBM Quantum Experience
Data Engineering	ETL/ELT, Data Modeling, Pipelines, Spark, Hadoop, Kafka
Data Visualization	Matplotlib, Seaborn, Plotly, SciPy
Software Engineering	OOP, Data Structures & Algorithms, Git, REST APIs
Cloud & DevOps	AWS (Fundamentals), Docker, PostgreSQL, Vertex AI
Tools & Platforms	Streamlit, Jupyter Notebook, Google Colab, VS Code, Anaconda, Ubuntu, IBM Quantum Composer, Gemini CLI
Frontend Development	React, HTML5, CSS3, JavaScript

Professional Experience

Research Intern – Quantum Machine Learning *Lloyd's Bank @ Mahindra University, Hyderabad*
Quantum-based Face Detection & Recognition Research Aug 2025 – Present

- Spearheading the development of the **first-ever Quantum Facial Biometric System**, a groundbreaking project integrating classical Computer Vision with Quantum Machine Learning (QML)
- Designing and implementing **hybrid quantum-classical pipelines** to enhance security and efficiency of facial recognition systems
- Developing **Variational Quantum Circuits (VQCs)** to work in tandem with classical CNNs
- Experimenting with **Quantum Convolutional Neural Networks (QCNNs)** and **Quantum Support Vector Machines (QSVM)** on biometric data
- *Technologies:* Qiskit, Python, PyTorch, TensorFlow, OpenCV, Computer Vision libraries

Perplexity Campus Ambassador *Perplexity AI (Volunteer)*
AI Literacy & Community Engagement Aug 2025 – Nov 2025

- Promoting AI literacy and driving adoption of Perplexity AI tools among the student community
- Organizing and leading **workshops and sessions** to educate peers on leveraging AI for research and development
- Fostering student engagement with cutting-edge AI technologies

Machine Learning Intern *Bharat Intern*
End-to-End ML Model Development Oct 2023 – Nov 2023

- Developed end-to-end machine learning models for **House Price Prediction**, **Wine Quality Prediction**, and **Iris Flower Classification**
- Engineered comprehensive data preprocessing pipelines and validated model performance
- Shared results and code via GitHub, receiving valuable peer and mentor feedback via LinkedIn
- *Technologies:* Python, Scikit-learn, Pandas, NumPy

Machine Learning Internship Training *Skill Vertex*
ML Fundamentals & Algorithm Implementation May 2023 – Jun 2023

- Completed intensive training in **supervised and unsupervised learning** algorithms
- Gained hands-on experience in regression, classification, and clustering using Python and Scikit-learn
- Implemented ML algorithms and automated data preprocessing scripts on real-world datasets

Research & Publications

Inventory Management using Artificial Intelligence
Published at ICIET Conference
Developed an AI-powered inventory management system to optimize stock levels, predict demand, and automate reordering processes using machine learning algorithms. **Hybrid Quantum Machine Learning Methods for Facial Bio-Metrics**
Poster Presented at Super Computing India -SCI2025
Developing a novel facial recognition system leveraging quantum circuits for enhanced feature extraction and classification.

Key Projects

Quantum Computing & QML

Quantum-Classical Pipeline for Facial Biometrics *Research Project | 2025*
Developing a novel facial recognition system leveraging quantum circuits for enhanced feature extraction and classification. Designing variational quantum circuits (VQCs) to work with classical CNNs. Experimenting with QCNN and QSVM architectures on biometric data.
Technologies: Qiskit, Python, PyTorch, OpenCV

Oracle Circuit Using Quantum Computing *B.Tech Project | 2024*
Developed quantum oracle circuits for Grover's algorithm, enabling efficient quantum search through possibilities compared to classical methods. Implemented and tested on IBM QASM simulator.
Technologies: Qiskit, QASM Simulator, IBM Quantum Experience

QCNN & QSVM Experiments *Academic Project | 2025*
Built quantum convolutional neural networks and quantum support vector machines for classification benchmarks, exploring quantum advantage in machine learning tasks.
Technologies: Qiskit, PennyLane, Python

Natural Language Processing & LLMs

Human-in-the-Loop Generative AI Application *LLM Project | 2025*
Built an interactive AI application allowing users to guide and correct AI-generated outputs. Implemented robust backend for managing dynamic AI workflows with streaming responses.
Technologies: LangChain, Streamlit, Python

QA Agent with LangGraph *LLM Project | 2025*
Designed and built an intelligent query-answering agent utilizing Large Language Models (LLMs) and the LangGraph framework for complex reasoning and information retrieval tasks.
Technologies: LangGraph, LangChain, Python

Multilingual Customer Support Chatbot *NLP Project | 2024*
Engineered a transformer-based chatbot capable of understanding and responding in multiple languages with context awareness and intent recognition.
Technologies: Transformers, Python, Streamlit, HTML/CSS/JS

Emotion Detection using GloVe-BiLSTM *NLP Project | 2024*
Implemented sophisticated NLP pipeline using GloVe embeddings and Bidirectional LSTM (BiLSTM) network for multi-class emotion recognition from text, achieving high classification accuracy.
Technologies: GloVe, BiLSTM, Keras, NLTK

Twitter Sentiment Analysis *M.Tech Project | 2025*
Implemented 1D CNN with embedding, convolutional, max pooling, and global max pooling layers for multi-class sentiment classification. Preprocessed text using NLTK for cleaning, tokenization, stopword removal, and sequence padding.
Technologies: TensorFlow, Keras, NLTK, Python

Deep Learning & Computer Vision

Combined Cycle Power Plant Energy Prediction using ANN from Scratch *M.Tech Project | Feb–Mar 2025*
Implemented a custom Artificial Neural Network **from scratch using only NumPy** (no deep learning libraries) to predict power plant output from environmental data. Developed complete training and inference pipeline with mini-batch gradient descent, L2 regularization, and momentum. Achieved **18% reduction in forecast error**.
Technologies: NumPy, Python (No DL libraries)

Anomaly Detection with AutoEncoders using TensorFlow *B.Tech Project | Mar 2024*
Developed unsupervised anomaly detection system using AutoEncoders to identify irregularities in ECG time-series data from the ECG5000 dataset. Trained exclusively on normal samples, using reconstruction error (MAE) to detect anomalies with high accuracy.
Technologies: TensorFlow, Keras, Python

Denoising Autoencoder for MNIST Image Reconstruction *B.Tech Project | Apr 2023*
Designed and implemented a convolutional denoising autoencoder using Keras to remove Gaussian noise from MNIST handwritten digit images. Constructed symmetric encoder-decoder CNN architecture with convolution, max-pooling, and upsampling layers.
Technologies: Keras, TensorFlow, Python

Face Mask Detection using CNN *Deep Learning Project | 2024*
Built real-time face mask detection system using Convolutional Neural Networks for safety monitoring and image classification applications.
Technologies: TensorFlow, OpenCV, Python

Traffic Volume Prediction with PyTorch *ML Project | 2024*
Developed web-enabled ML model for traffic forecasting with interactive data visualization dashboard.
Technologies: PyTorch, Streamlit, Plotly

Full-Stack & Data Engineering

University Cultural Festival Registration Web Application *Full-Stack Project | 2024*
Developed ASP.NET Core MVC web application with SQL database integration and form validation to manage event registrations efficiently.
Technologies: ASP.NET Core MVC, SQL Server, C#

Serverless Full-Stack E-Commerce Application with AlloyDB *Cloud Project | 2024*

Developed React frontend with serverless API endpoints (Vercel) connected to AlloyDB for products, orders, and user management.
Technologies: React, Vercel, AlloyDB, REST APIs

Real-Time Sales Data Pipeline *Data Engineering Project | 2025*
Built real-time data ingestion and aggregation pipeline connecting Kafka, Spark, and PostgreSQL for streaming analytics.
Technologies: Apache Kafka, Apache Spark, PostgreSQL

EDA on IPL Dataset *Data Analysis Project | 2025*
Performed exploratory data analysis on IPL cricket dataset to uncover trends in team performance, batting, and bowling statistics. Created data-driven visualizations for player and match analysis.
Technologies: Pandas, Matplotlib, Seaborn, Python

Plant Prediction using ML (Crop Recommendation System) *ML Project | 2023*
Built machine learning model to predict the best crop for a given state, season, and month with high accuracy, improving agricultural decision-making.
Technologies: Scikit-learn, Pandas, Python

Certifications

Quantum Computing

- IBM Qiskit Advocate Program (2025)
- AICTE Certified FDP on Quantum Computation (2025)
- IBM: Quantum Machine Learning
- IBM: Basics of Quantum Information
- IBM: Fundamentals of Quantum Algorithms
- Quantum Business Foundations

AI & Machine Learning

- Introduction to Artificial Intelligence – IBM (2021)
- Intro to Machine Learning – Kaggle (2023)
- Programming with Python – Internshala (2022)
- Speech Recognition using Python – Presidency University

Web Development & UX

- Introduction to Front-End Development – Meta (Coursera)
- Principles of UX/UI Design – Meta (Coursera)
- Programming with JavaScript – Meta (Coursera)

Achievements & Awards

- **IBM Qiskit Advocate 2025** – Selected for the prestigious IBM Qiskit Advocate Program for contributions to quantum computing community
- **International Sports Representative** – Represented the **Indian Men's Throwball Team** at the Indo-Sri Lanka Youth Cup 2024 (**Runner-up**)
- **University Sports Leadership** – Incharge and Captain of the University Throwball Club, leading team strategy and player development
- **Published Researcher** – Published research paper on "Inventory Management using Artificial Intelligence" at ICIET Conference
- **Google Code Vipasana 2025** – Participated in the prestigious Google coding competition

- **Merit Scholarship** – Awarded merit-based scholarship for outstanding academic performance in M.Tech program at Mahindra University
- **Perplexity Campus Ambassador** – Selected to promote AI literacy and organize workshops for student community
- **Creative Arts** – Served as Director of Photography (DOP) in a regional short film competition

Leadership & Extracurricular Activities

- **Captain & Incharge** – University Throwball Club, Mahindra University
- **Perplexity Campus Ambassador** – Leading AI literacy initiatives and workshops
- **Workshop Conductor** – Organized sessions on AI/ML for peers
- **Sports:** Throwball (National Level), Volleyball, Badminton, Chess
- **Hobbies:** Traveling, watching movies and writing reviews, reading tech newsletters, exploring new cultures

Research Interests

- Quantum Machine Learning
- Hybrid Quantum-Classical Systems
- Large Language Models (LLMs)
- Computer Vision
- Natural Language Processing
- Deep Learning Architectures
- Generative AI
- Reinforcement Learning
- AI for Healthcare

Research Mentorship

Dr. Jayasri Dontabhakthuni
Faculty Mentor – Mahindra University
Research Focus: Quantum Machine Learning
Collaborative work on advanced QML algorithms and quantum computing applications in biometric systems.

References

Available upon request.

Last updated: December 19, 2025