

Amrutha Rani Kanike

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Education

Indian Institute of Technology Bombay, Bachelor's in Computer Science

Oct 2022 – May 2026

Experience

Revival Propensity Stratification using Machine Learning

SBI Life Insurance | Data Science Internship

May – July 2025

- Built a revival-scoring pipeline using **150+** customer attributes to capture key behavioral trends
- Applied **KMeans**, **XGBoost**, **GradientBoosting**, and **RandomForest** for revival classification
- Performed **decile-wise** lift analysis to target top-ranked policyholders and built mismatch detector using **MiniLM**, **TextBlob**, **VADER**

Academic and Other Projects

Fake News and Bias Analyzer

Spring 2024

Self Project

- Developed a multitask pipeline for fake news, clickbait, stance, and bias detection using neural and statistical features
- Integrated **TF-IDF**, skip-thought vectors, sentiment analysis, entity recognition, and readability metrics
- Fine-tuned **BERT** for bias classification; evaluated using **F1-score**, **ROC-AUC**, and confusion matrix

Language Translator

Spring 2024

Self Project

- Built an English-to-Hindi neural machine translation system using **Hugging Face Transformers** and **TensorFlow**
- Improved translation quality via corpus cleaning, tokenization, and normalization
- Deployed an interactive real-time translation interface using **Gradio**

Brain Tumor Detection via Transfer Learning

Spring 2024

Self Project

- Fine-tuned pretrained **VGG16** and **ResNet50** models on MRI brain scan datasets
- Applied data augmentation, dropout regularization, and early stopping to reduce overfitting
- Used **Grad-CAM** visualizations to highlight tumor regions for clinical interpretability

Vision–Language Captioning with Adaptive Attention

Spring 2024

Self Project

- Implemented a CNN–RNN image captioning pipeline with **Bahdanau Attention** on the Flickr8k dataset
- Benchmarked **VGG19**, **ResNet50**, and **AlexNet** as visual encoders
- Evaluated generated captions using **BLEU** and **METEOR** metrics

Face Recognition using Deep Metric Learning

Spring 2023

Self Project

- Implemented **FaceNet** with **Triplet Loss** for discriminative facial embeddings
- Trained on **LFW** and custom datasets for identity verification
- Achieved high recognition accuracy using cosine similarity and threshold tuning

Audio-Based Network Simulation

Spring 2024

Guide: Prof. Vinay Rebeiro | Course Project

- Built a custom physical layer using **PyAudio** for audio-encoded data transmission with framing and error checks
- Implemented a Python-based MAC protocol supporting multi-node communication with collision detection
- Analyzed network behavior using **Wireshark** and **Scapy**; compared **TCP Reno** and **Cubic**

Stock Price Forecasting using LSTM

May 2025

Self Project

- Trained an **LSTM** model to forecast stock prices from historical closing data

- Applied scaling, windowing, and walk-forward validation for robust prediction
- Evaluated performance using **RMSE** and trend visualizations

Cricket Score Prediction using Regression Models

June 2025

Self Project

- Implemented **Linear Regression**, **Decision Trees**, and **XGBoost** for T20 score prediction
- Engineered match-specific features such as run rate, overs remaining, and wickets

Automated Anomaly Detection in Cardiac MRI

2024

Guide: Prof. Ajit Rajwade | CS 736 Course Project

- Built a 3D shape modeling pipeline using mesh sampling, Procrustes alignment, and **PCA**
- Combined PCA embeddings with quantitative metrics for multi-modal classification
- Trained a **Random Forest** classifier with stratified cross-validation and feature-importance analysis

Entity Extraction and Classification

Autumn 2025

Self Project

- Built an **SVM**-based entity recognition system using lexical, syntactic, and contextual features
- Trained on the **CoNLL** dataset with capitalization and positional cues
- Evaluated using accuracy, recall, and **F1-score** with targeted error analysis

Part-of-Speech Sequence Modeling

Autumn 2025

Self Project

- Implemented an **HMM**-based **POS tagger** using the Brown corpus
- Designed an efficient vocabulary encoding scheme for fast inference
- Improved tagging accuracy through hyperparameter tuning and error analysis

Course Recommendation System

Spring 2024

Guide: Prof. S. Sudarshan | Course Project

- Developed a full-stack web application using **Node.js**, **Express.js**, and **PostgreSQL**
- Applied **K-Means clustering** to group students by interests and performance
- Built a **React** frontend with personalized, friend-based, and popularity-driven recommendations

Honors and Achievements

- Recognized as one of **'The Wonder Woman' – Top 50 Female Coders** in HackOn with **Amazon** (2024)
- Secured **All India Rank 320** in **JEE Advanced** among **1.5 lakh** candidates nationwide (2022)
- Secured **All India Rank 320** in **KVPY** conducted by **IISc Bangalore** among **50k** candidates (2020)
- Achieved a **99.85 percentile** in **JEE Main** among over **1 million** candidates (2022)
- Secured **State Rank 95** in **APCET** among **3 lakh** candidates from Andhra Pradesh (2022)

Technical Skills

Programming Languages: C, C++, Python, Java, JavaScript, Bash, Prolog, VHDL, Assembly, Lex, Yacc, Sed, Awk
Systems & Platforms: Linux, Unix, xv6, Windows Internals (basic), Multithreading, Scheduling, IPC, Memory Management

AI / Machine Learning: PyTorch, TensorFlow, Keras, Scikit-learn, NumPy, Pandas, NLP (NLTK, spaCy), Transformers (BERT), Model Evaluation

Search & Agentic Concepts: Semantic Search, Feature Engineering, Ranking Models, HMMs, Clustering, Retrieval-Augmented Pipelines, Agent Workflows (conceptual)

Web & Backend Development: HTML, CSS, JavaScript, React, Node.js, Express.js, Django, REST APIs, PostgreSQL
Developer Tools & DevOps: Git, Docker, Linux Tooling, CI/CD (basic), Debugging, Profiling, Performance Benchmarking

AI Developer Tooling: GitHub Copilot, ChatGPT for coding & design, Prompt Engineering, Model Prototyping

Networking & Systems Analysis: TCP/IP, Wireshark, Scapy, Network Simulation, Latency Analysis

Mathematical & Data Tools: MATLAB, SciPy, Statistics, Probability, Optimization, Linear Algebra