Arunabh Barooah

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Education

PES UNIVERSITY – *Bengaluru, Karnataka* *Sept 2022 - May 2026*
B.Tech in Computer Science and Engineering | CGPA: 8.76/10.0

- 3x recipient of Prof. CNR Rao Merit scholarship, awarded to the top 20% of students in the CSE branch.
- 2x recipient of Distinction Award.
- Core member of Parallax (AR/VR Club) and member of CodeChef ECC.

PSBB Learning Leadership Academy – *Bengaluru, Karnataka* *April 2022*
Secondary and Higher Secondary | 10th CBSE: 93.2%, 12th CBSE: 88.8%

- Member of KSCA U16 Inter-School Cricket Team.

Skills

- **Programming Languages:** C, C++, Python, Go, JavaScript, HTML, CSS
- **Web Development:** MongoDB, Express, ReactJS, NodeJS, NextJS, MySQL
- **Other Tools:** Apache Hadoop, Apache Kafka, PySpark, Git, GitHub
- **Design Tools:** Figma, Krita, Blender, Canva

Experience

Centre for Cognitive Computing & Computational Intelligence (C3I), PES University *June 2024– July 2024*
Research Intern
Project Title: Audio Genre Classification and Visualization

- Carried out research on how accurate audio genre classification is with limited amount of data and how it affects the overall output quality.
- Implemented a deep learning model with 93% accuracy for genre classification and song recommendation.

Research Papers and Publications

Presented "**Deep Tune Network: An Approach Towards Music Classification and Recommendations**" at **10th International Conference on ICT for Sustainable Development** in Goa, July 17 2025.

- Developed **Deep Tune Network (DTN)** using Convolutional Neural Networks and MFCCs for automatic music genre classification, achieving **93.01% test accuracy** on the GTZAN dataset.
- Designed and implemented a **cosine similarity-based recommendation system** with a **similarity score of 0.85** for acoustically similar songs, enabling personalized playlist generation.
- Outperformed traditional MLP and RNN-LSTM models by a significant margin of 25%+ in accuracy, generalization, and stability for real-time audio classification.

Projects

1) Distributed Logging System for Microservices

- **Scalable Logging:** Designed and implemented a distributed logging system for microservices using Apache Kafka, Elasticsearch, and Fluentd.
- **Real-Time Monitoring:** Developed a heartbeat mechanism for node health tracking and real-time log ingestion, achieving 99% log delivery reliability.
- **Alerting & Storage:** Integrated an alerting system for critical logs with less than 100ms end-to-end delay and optimized log storage for fast querying.
- **Centralized Visibility:** Enabled centralized log management, ensuring operational insights and proactive issue resolution.

2) Serverless Function Execution Platform

- Designed and developed a serverless function platform enabling on-demand HTTP execution of Python and JavaScript functions with sub-200ms cold start latency.
- Developed backend using FastAPI with Docker and gVisor for secure and scalable multi-language execution.
- Integrated a function packaging and execution engine with time/resource constraints, pre-warmed containers, and request routing.
- Built a real-time monitoring dashboard using Streamlit for visualizing function metrics like response time, error rate, and resource usage.

3) Retail Expansion and Inventory Intelligence Platform

- **Geospatial Intelligence**: Built a location recommendation engine to rank top 100 store locations, factoring in land prices, demographics, median income, and up to 10 km competition radius.
- **Explainable AI**: Leveraged Census, Overpass, and Gemini API to generate justifications for site selection, highlighting 6+ socioeconomic indicators.
- **Demand Forecasting**: Created stock prediction models with 90%+ accuracy using 20+ features including festivals, discounts, census data, and demographic profiles.
- **Sales-Driven Stock Prediction**: Processed and analyzed historical sales data (up to 2 years across 5 stores) to generate weekly restocking plans with visual dashboards using Streamlit, Folium, Pandas, NumPy, Plotly, Seaborn, and Scikit-learn.