AYUSH SAUN

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Professional Summary

Engineer & Applied Researcher with **2+ years** turning data into production value through cloud-native **ETL** pipelines, big-data speech processing and robust **data-modeling**. Shipped **40+** zero-downtime releases at Samsung—launching a green-field portal in < 6 months and sustaining **99.8%** uptime—before halving audio-deepfake error to **EER 6.3%** on **575 h** of speech at IIIT-Delhi with reproducible **PyTorch** MLOps that ran experiments **3×** faster. Owns the full lifecycle—data ingestion, feature engineering, model training, CI/CD, and observability—using Python, SQL, AWS, Docker, and Git to deliver measurable, production-ready impact.

Education

M.Tech Computer Science (CGPA: 8.0) — **IIIT-Delhi**
Aug 2024 - Present — Delhi, India

B.Tech Electrical Engineering (CGPA: 7.84) — **Delhi Technological University**
Aug 2018 - June 2022 — Delhi, India

Experience

Post-Graduate Researcher — **Jan 2025 - July 2025**
Infosys Centre for Artificial Intelligence, IIIT-Delhi — Delhi, India

- Designed a **modular ETL/train/validate/infer pipeline** for speaker verification and anti-spoofing, processed over **500 hrs** of speech data, and cut pipeline build time **3×**.
- Fine-tuned SOTA **self-supervised encoders** (HuBERT, Wav2Vec2, WavLM) with CNN heads (AASIST, ECAPA-TDNN), slashing spoof **EER to 5.6%** (-50%).
- Applied **RawBoost**, **MUSAN**, and **RIR** augmentation, reducing tandem-EER to **30%** and boosting accuracy **+12%**.
- Led end-to-end research ops data curation, hyper-parameter sweeps, ablations, GPU scheduling—and benchmark models.
- **Tech Stack: Python**, **PyTorch**, **TorchAudio**, **HuggingFace Transformers**, **HuBERT**, **Wav2Vec2**, **WavLM**, **TitaNet**, **ECAPA-TDNN**, **RawBoost**, **MUSAN**, **RIR**, **Git/GitHub**, **Linux**, **CUDA**

Software Engineer — **Jun 2022 - Jul 2024**
Samsung R&D Institute India - Delhi — Delhi, India

- Full-stack developer for **4** internal portals (∼100 users); built REST APIs, optimized databases, and automated **CI/CD** for **40+** annual releases with **99.8%** uptime.
- Created responsive UIs using **React.js** & **Material-UI**; implemented **Jest** tests, improving engagement **25%** and reducing load times **35%**.
- Designed secure **Spring Boot** microservices with token-based auth, **JUnit**, and **Swagger**, boosting developer efficiency.
- Tuned **Oracle SQL** queries and caching, cutting API latency **40%** and lowering infrastructure costs.
- Managed **AWS** resources (**S3**, **EC2**, **IAM**, **CloudFront**, **CloudWatch**) for compliant, monitored infrastructure.
- Led Agile sprints using **Jira** & **Confluence**, increasing team velocity **20%**.
- Built hackathon prototype with **Angular.js**, **Python**, and **Hugging Face** ML for advanced analytics.
- Delivered 4^{th} portal end-to-end—requirements, UX, QA, deployment, and post-release support—in **under 6 months**.
- **Tech Stack: React.js**, **Material-UI**, **Angular.js**, **Jest**, **Java Spring Boot**, **Python**, **Swagger**, **JUnit**, **Oracle SQL**, **AWS** (S3, EC2, IAM, CloudFront, CloudWatch), **Git/GitHub**, **CI/CD**, **Jira**, **Confluence**, **Jenkins**

Projects

Audio Deepfake Detection — **Jan 2025 - Jul 2025**

- Benchmarked SOTA anti-spoofing models (**WavLM Base**, **ECAPA-TDNN**, **RawNet2**) over **575 hrs** of audio data using a modular **PyTorch** k-fold pipeline for statistically robust metrics.
- Adapted SSL encoders (**HuBERT**, **Wav2Vec2**, **WavLM**) with CNN heads (**AASIST**, **ECAPA-TDNN**), halving spoof **EER** to **5.6%**.
- Accelerated training with Bayesian hyperparameter search and waveform augmentations (**RawBoost**, **MUSAN**, **RIR**), reducing iteration time **30%**.
- Streamlined dataset/model loading, checkpointing, and experiment tracking via **SpeechBrain** and **HuggingFace Transformers** and managed full research workflow: dataset curation, GPU scheduling, ablations, and benchmarking.
- **Tech Stack: Python**, **PyTorch**, **SpeechBrain**, **HuggingFace Transformers**, **HuBERT**, **Wav2Vec2**, **WavLM**, **TitaNet**, **ECAPA-TDNN**, **RawNet2**, **RawBoost**, **MUSAN**, **RIR**, **CUDA**, **Git/GitHub**, **Linux**

Automatic Speaker Verification System — **Jan 2025 - Jul 2025**

- Built an end-to-end biometric speaker-verification pipeline with **deep speaker embeddings**, **residual-phase features**, and **ensemble score fusion**; trained over **350 hrs** multilingual speech data for secure enterprise sign-in.

- Optimized features and scorers, reducing tandem **EER to 28%**, while managing full delivery cycle: data prep, GPU scheduling, hyperparameter sweeps, evaluation, deployment, and support.
- **Tech Stack: Python**, **PyTorch**, **SpeechBrain**, **HuggingFace Transformers**, **CUDA**, **Git/GitHub**, **Docker**, **Linux**

ScholarAI – AI-Powered PDF Learning Assistant **Mar 2025 - Jun 2025**

- Built an AI-first web app converting academic PDFs into interactive learning formats—**summaries**, **study notes**, **flashcards**, and **quizzes**—enhancing comprehension and retention.
- Developed end-to-end document workflows using **Genkit** and **LangChain**, leveraging **GPT-4 Turbo** and **Gemini Pro** for structured content aligned with UX schemas.
- Architected dynamic UI with **React (Next.js 15)** and **Tailwind CSS**, including accordion summaries, editable notes, click-to-flip flashcards, and real-time quizzes.
- Engineered PDF parsing with **pdfjs-dist** and **pdfplumber**, integrated **Firebase** for state and assets, and deployed full-stack app to **Vercel** with Turbopack optimizations and custom LLM workflows.
- **Tech Stack: TypeScript**, **Next.js 15**, **React 18**, **Tailwind CSS**, **Genkit**, **LangChain**, **GPT-4 Turbo**, **Gemini Pro**, **Vercel**

Single-Object Tracking System **Aug 2024 - Dec 2024**

- Built a real-time tracker with **camera-motion compensation** using ORB-based affine alignment, achieving **30 FPS** on 1080p streams.
- Enhanced robustness to shape, texture, and scale variation via multi-scale search windows and hybrid descriptors (**HOG**, **LBP**, **SIFT**, **ORB**).
- Used ensemble regressors (**Linear Regression**, **Random Forest**) for centroid and bounding-box prediction, reaching **85% IoU**, $R^2 = 0.92$, and reducing **MAE 20%**.
- Managed full delivery: dataset curation, hyperparameter sweeps, profiling, Git code reviews, deployment, and integration into downstream CV pipelines.
- **Tech Stack: Python**, **OpenCV**, **HOG**, **LBP**, **SIFT**, **ORB**, **Linear Regression**, **Random Forest**, **NumPy**, **SciPy**, **Matplotlib**, **Git**, **Linux**

Skills

Programming Languages & Scripting: Python, SQL, C++, Java, JavaScript, TypeScript

AI, Machine Learning & Data Science: PyTorch, TensorFlow, scikit-learn, Hugging Face **Transformers**, ETL Pipelines, Data Modeling, Hadoop, SpeechBrain, torchaudio, OpenCV, librosa, Pandas, NumPy, Matplotlib, CUDA

Cloud & DevOps: AWS (S3, EC2, IAM, CloudFront, CloudWatch), Docker, Jenkins, Git/GitHub, Linux, RESTful APIs, CI/CD, Jira, Confluence

Web & Software Development: React, Angular, Material-UI, Java Spring Boot, Swagger/OpenAPI, Jest, JUnit, Full-Stack Development

Productivity Tools & IDEs: VS Code, Jupyter Notebook, Google Colab, Postman, LaTeX/Overleaf, Anaconda, IntelliJ IDEA

Professional Skills: Research Development, Agile/Scrum, Technical Documentation, Problem-Solving, Project Management, Cross-Functional Collaboration, Release Coordination, Presentation Skills

Interests & Achievements

- Completed **200 + competitive-programming questions**, strengthening data-structures, algorithms, and analytical reasoning.
- Passed **Samsung R&D Code Competency Test**, ranking in the top performance band for coding efficiency and software design.
- Achieved **runner-up** position among **50+ teams** in a company hackathon by **rapidly developing a AI/ML based solution** under **tight deadlines**.
- Awarded **Best Teaching Assistant** for CSE101: Introduction to Programming (2024–2025) by the Dean of Academic Affairs at IIIT Delhi.

Positions of Responsibility

Teaching Assistant **IIIT-Delhi**

- **Introduction to Programming** **Aug 2025 - Present**
- **Database Management Systems (DBMS)** **Jan 2025 - Apr 2025**
- **Introduction to Programming** **Aug 2024 - Dec 2024**

Certifications

- **Programming with Python: Hands-On Introduction for Beginners** — Udemy **2020**
- **Front-End Web Development with React** — Coursera **2020**
- **Front-End Web UI Frameworks and Tools: Bootstrap 4** — Coursera **2020**