

Abhijat Bharadwaj

Indian Institute of Technology Bombay

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Profile: Software Developer, Signal Processing and AI/ML Engineer

Education

Indian Institute of Technology Bombay

Graduating: 2026

Major Degree: B.Tech and M.Tech (Dual Degree) in Electrical Engineering,

Specialization: Communication and Signal Processing

Minor Degree: Computer Science and Engineering

Research and Professional Experience

Wavelet Scattering based Feature Engineering in MRI and Deep Learning

Sep 2024 – Nov 2024

Guide: Prof. Vikram M. Gadre, IIT Bombay

- Achieved **20% improvement** in 3D Brain MRI registration than geometric alignment by introducing spatial invariance using Wavelet Scattering Transform
- Engineered **novel features** useful for unsupervised detection of ischemic stroke lesions in brain MRI scans
- Improved brain tumor classification accuracy from MRI scanned images **from 65% to 90%** with 80% less epochs using Wavelet Scattering features

Automatic Music Transcription of Western and Carnatic Guitar

Aug 2024 – Nov 2024

Guide: Prof. Preeti Rao, IIT Bombay

- Fabricated a dataset of around **300 samples** for study of signal behaviour of **5+** guitar articulations
- Examined **accuracy** of music transcription of Carnatic Guitar by techniques developed on Western music
- **Successfully identified** crucial **differences** between **spectrograms** of both the genres and **reported improvements** to the methodologies, improving the detection accuracy

Full Stack Developer | Trubuddyy Solutions Pvt. Ltd.

Jul 2023 – Aug 2023

- Developed a mentor **search system** with best match sorting for using weighted **fuzzy string matching**
- Automated **Zoom** meet scheduling, **Whatsapp** and **SMS** reminders using **Twilio**, and **Stripe** Payments

Frontend Developer Intern | Application Software Centre, IIT Bombay

May 2023 – Jul 2023

- Streamlined independent maintenance of **MyIITB** apps by engineering a **micro-frontend architecture**
- Developed **support for 5+** JavaScript frameworks, including Angular, React, and Vue using **Single-SPA**

Technical Projects

Next-Gen Dream Team Builder | Dream11 | InterIIT Tech Meet 13.0

Nov 2024 – Dec 2024

- **Supervised** and **represented** IIT Bombay's team in InterIIT Tech Meet, securing **2nd position** overall
- Developed a fantasy cricket team-building assistant for Dream 11 designing pipelines for **4GB+ data**
- Devised a **novel** CNN-based **dual model** architecture, **reducing** fantasy point prediction errors to **13%**
- Integrated **LIME** and built an interactive chatbot using **RAG** with **Llama**, enhancing user experience

Mess-I: Mess Digitalization System | [Project Link](#)

May 2022 – Present

- Led the development of the **official** mess management system of IIT Bombay with **10,000+ DAU**
- Deployed the system in **14+ hostels**, in **20+** devices, recording **4,000,000+** meals and **16K+** net users
- Optimized server load during peak traffic hours, utilized **nginx** as **load-balancer**, improving reliability

InstiApp | [Project Link](#)

May 2023 – Present

- Developing InstiApp - IIT Bombay's one-stop solution with **10,000+** downloads and **4,000+ DAU**
- Supervised the development of Buy and Sell Portal, attracting **200+ posts** in the first month of launch
- Working in an agile environment with product designers to deliver aesthetic functionality for ease of user

- MongoGBackup** | [Project Link](#) Jul 2024
- Created a **PyPI library** for hashed, compressed and **encrypted** MongoDB backups on Google Drive
 - Deployed a **cron job** to schedule backups on production database with **15,000+** No-SQL records per day
- Estimation of Covariance Matrix for Compressive Measurements** | [Project Link](#) Apr 2024
- Achieved a **2x reduction of error** in unbiased estimator while retaining the same order of computations
 - Utilized Python, **Keras**, **Cuda** to benchmark performance on MNIST, SuiteSparse, and Traffic datasets.
- Virtual Proctoring System using YOLO Object Detection** | [Project Link](#) Mar 2023 – Apr 2023
- Customized the **YOLO** model and **dlib** face detection for detecting automated proctoring of online exams
 - Developed **object** and **behavior detection** like multiple faces, phones, line-of-sight, and lip movement

Positions of Responsibility

- Overall Coordinator** **DevCom, IIT Bombay** Apr 2024 – Present
- Led a **team of 30+** designers and developers to maintain and enhance IIT Bombay's **digital** infrastructure
 - Improved **reliability** and achieved **40% increase** in server up-time by efficient resource management
 - Deployed an nginx based **documentation** system for **5+ projects** for effective knowledge transfer
- Project Lead** **DevCom, IIT Bombay** Apr 2023 – Mar 2024
- Spearheaded the **development** of Mess-I, InstiApp, and MyIITB portal, crucial for **12,000+ people**
 - **Improved** code and production **maintainability** by **35%** by enforcing better development practices
 - **Streamlined** the app **release** process, standardized **versioning**, and integrated **Sentry** for monitoring

Relevant Coursework

AI and Machine Learning	Introduction to Machine Learning, Geospatial Predictive Modelling, Image Processing, Advanced Image Processing, Applied Linear Algebra, Computer Vision, Probability and Random Processes, Markov Chains and Queuing Systems
Computer Science	Operating systems, Code Optimization for Object-Oriented Languages, Data Structures and Algorithms, Design and Analysis of Algorithms, Logic in Computer Science
Electrical Engineering	Signal Processing-I, Digital Signal Processing, Wavelets, Communication Systems-I, Microprocessors, Testing and Verification of VLSI Circuits, Control Systems

Technical Skills

Languages:	Dart, Python, C++, JavaScript, TypeScript, MATLAB, Bash, JAVA
AI/ML and Data Science:	LLaMa, YOLO, FAISS, Chain-Lit, Gradio, Langchain, Scikit-Learn, OpenCV, NumPy, Pandas, Torch, Keras, LIME, SHAP
Software Development:	Flutter, React, Django, Flask, Micropython, NextJS, Angular, Vue, Soot
Databases:	MongoDB, PostgreSQL, SQLite, MySQL
DevOps:	Docker, Linux, Amazon Web Services (AWS) Google Cloud Platform (GCP), NGINX, uWSGI, Gunicorn, Umami, Sentry, New Relic, Proxmox

Extra Curriculars

- **Directed** and lead the team to win **gold** in MDGC championship, achieving top 3 for three years 2024
- **Awarded** with **Excellence in Teaching Assistantship** for successfully troubleshooting WSL and XServer setup for **200+ students**, ensuring a smooth progression of the course 2023
- Represented IIT Bombay in the **Inter-IIT** Cultural Meet, scoring **2nd position** overall 2023
- Successfully directed and acted in a **self-written** stage play in **Sanskrit** in **grade 10th** and received **special mention** for **creativity** and **performance**. 2019