



Shreyas Manish Nadkarni
Electrical Engineering
Machine Intelligence and Data Science
Indian Institute of Technology Bombay

19D170029
Dual Degree (B.Tech. + M.Tech.)
Gender: Male
DOB: 18/09/2001

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2024	9.15
Intermediate	Maharashtra State Board	Sathaye College	2019	90.15%
Matriculation	ICSE	Parle Tilak Vidyalaya	2017	98.33%

Key Area of Expertise: Python programming for system development, pipelines, data processing and ML using standard libraries

SCHOLASTIC ACHIEVEMENTS

- Scored a **perfect 10 SPI** in Semester 8 including **AA** in B.Tech Project - II that got published in ISMIR 2023, Italy (2023)
- Obtained a **change of branch** to Electrical Engineering on grounds of **academic performance** (2020)
- 99.87** percentile in **JEE Main** | All India Rank **1587** in **JEE Advanced** (total 224,000+ students) | **KVPY** Recipient (2019)
- All India topper** in **3 subjects** and the **school topper** in ICSE Board Exams | Best **All-Round Performance** Award (2017)

PUBLICATIONS

- S. Nadkarni***, S. Roychowdhury*, P. Rao, M. Clayton, "Exploring the Correspondence of Melodic Contour With Gesture in Raga Alap Singing", International Society for Music Information Retrieval, Milan, Italy, 2023 (*research work done as a part of B.Tech Project - II and being continued as Dual Degree Thesis Project*)

* Equally contributing lead authors

PROFESSIONAL EXPERIENCE

Associate Data Scientist Summer Intern | **NoBroker Technologies Solutions Pvt. Ltd.** (May-July 2022)

A prop-tech company providing a real-estate platform to buy, sell, and rent properties without charging any brokerage

- Implemented **speech transcription** using an ASR model trained on call data with **Voice Activity Detection (VAD)**
- Developed a **chatbot** for intent classification and reply generation, using **Rasa NLU** with **custom actions** in Python
- Integrated them in an **end-to-end Python pipeline** for customer data collection with a seamless conversational experience

KEY PROJECTS

Audio-Gesture Correspondence in Indian Classical Music

(January 2023 - Present)

B.Tech Project Stage-II and Dual Degree Project Stage-I | Guide: Prof. Preeti Rao, EE, IITB

- Constructed extensive data processing pipelines with **multidimensional time series** from over **10 hours** of audiovisual data
- Performed pitch contour extraction, silence removal, note segmentation and subsequence search using **Dynamic Time Warping**
- Trained **SVMs** to classify notes (stable vs non-stable) from gesture keypoint time series achieving **F1-scores** upto **89.9%**
- Currently working with similar techniques with the long-term research vision of developing an **avatar for singing**

Genre Classification and Analysis of Marathi Songs

(April - June 2021)

Summer Undergraduate Research Project | Guide: Prof. Preeti Rao, EE, IITB

- Extracted audio spectral features using **Librosa** from a self-curated dataset of over **150 Marathi songs** spanning **3 genres**
- Constructed genre-classification **SVM** models in **Scikit-learn** and achieved a **5-fold-cross-validation** accuracy of **80%**
- Published as a "**Late-Breaking Demo**" (**LBD**) (forum for early research results) in **ISMIR 2022**, Bengaluru, India

Multiresolution K-Means Clustering for Image Segmentation

(July - November 2022)

Wavelets (EE 678) Course Project | Instructor: Prof. Vikram Gadre, EE, IITB

- Researched topics such as **wavelets**, **contourlets** and **shearlets**, and neural networks containing multiresolution components
- Implemented **iterative K-means clustering** on multiscale brain MR images to segment white and gray matter, in a team of 2
- Achieved an **IoU score** of **96.6%** with the **Haar DWT** implemented using **PyWavelets**, with 6 levels of resolution

Time Series Forecasting using Transformer Attentional Copula (TACTiS)

(August - November 2022)

Deep Learning Theory & Practice (IE 643) Course Project | Instructor: Prof. P. Balamurugan, IEOR, IITB

- Trained a **multivariate probabilistic model** with a **transformer architecture** on financial time series, in a team of 2
- Compared the forecasting performance on each time series using the **CRPS** metric as done in the original **ICML paper**

Sub-Nyquist Sampling and Reconstruction of FRI Signals

(March - April 2023)

Advanced Topics in Signal Processing (EE 779) Course Project | Instructor: Prof. Satish Mulleti, EE, IITB

- Demonstrated perfect reconstruction of a **Finite-Rate-of-Innovation (FRI)** signal sampled at a rate lower than that specified by the Nyquist-Shannon sampling theorem for reducing storage space and computation, using **annihilating filters** in Python

Automatic Spoken Word Recognition | Key Python libraries: **Librosa, Hmmlern**

(November 2022)

Speech Processing (EE 679) Course Project | Instructor: Prof. Preeti Rao, EE, IITB

- Trained a word recognizer using **HMMs** on cepstral features (**MFCCs**) extracted from Google Speech Commands Dataset
- Achieved a testing accuracy of **91%** while recognising words belonging to a **set of 10** from the audio of the spoken word

Handwritten Text Recognition | Key Python library: **PyTorch**

(April 2021)

Introduction to Machine Learning (CS 419) Course Project | Instructor: Prof. Abir De, CSE, IITB

- Trained a **CNN** classifier on the **Extended MNIST** dataset, in a team of 3, including preprocessing and **batch normalization**
- Obtained a testing accuracy of **85%** and used the model on unseen images using the **contour detection** method

Image Enhancer GUI Application | Key Python libraries: **NumPy, Tkinter**

(November 2021)

Image Processing (EE 610) Course Project | Instructor: Prof. Amit Sethi, EE, IITB

- Carried out **Canny edge detection** and image operations such as blurring, thresholding, gamma correction (using **only NumPy**)
- Integrated them into a ready-to-use **GUI** for loading, editing, and saving a custom image with **undo** and **reset** functionalities

Compiled Code Logic Simulator | Key Python library: **Networkx**

(September 2021)

Foundations of VLSI CAD (EE 677) Course Project | Instructor: Prof. Virendra Singh, EE, IITB

- Designed a digital logic simulator with **directed acyclic graphs** to assert logical correctness in maximum speed
- Developed an **end-to-end system** for parsing the inputs from a text file, **generalizable to any number** of inputs and outputs

Global Economic Freedom and Happiness | Key Python libraries: **Matplotlib, Scikit-learn**

(November 2020)

Programming for Data Science (DS 203) Course Project | Instructor: Prof. Amit Sethi, EE, IITB

- Conducted a detailed **EDA** of the Economic Freedom Index and World Happiness Report to study **feature correlation**
- Trained **Lasso, Ridge** and **MLP regressor** models to predict happiness levels, including **grid-search** and **cross-validation**

KEY COURSES UNDERTAKEN

Data Science	Programming for Data Science, Introduction to Machine Learning, Deep Learning Theory and Practice, Decision Analysis and Game Theory, Distributed Optimization in Machine Learning
Electrical Engg.	Signal Processing - I, Digital Signal Processing, Probability and Random Processes, Advanced Topics in Signal Processing, Speech Processing, Music Analysis through Computing, Image Processing, Wavelets
Computer Science	Computer Programming and Utilization, Algorithms and Complexity, Foundations of Intelligent and Learning Agents, Automatic Speech Recognition
Non-Technical	Economics, Industrial Economics, Psychology, Technical Communication, Managerial Psychology*, Behavioral Foundations of Decision Making (Audit Course)*

CERTIFIED ONLINE COURSES

(* to be completed by November 2023)

1. SQL - MySQL for Data Analytics and Business Intelligence

(Summer 2023)

Platform: Udemy, Instructor: 365 Careers | Course Duration: 12 hours

2. Python for Data Science and Machine Learning Bootcamp

(Summer 2021)

Platform: Udemy, Instructor: Jose Portilla, Pierian Data Inc. | Course Duration: 25 hours

3. Python for Computer Vision with OpenCV and Deep Learning

(Summer 2021)

Platform: Udemy, Instructor: Jose Portilla, Pierian Data Inc. | Course Duration: 14 hours

POSITION OF RESPONSIBILITY

Department Academic Mentor | **DAMP, EE, IITB**

(May 2022 - April 2023)

- Guided **6 second-year students** through their sophomore year with their academics and professional development
- Developed a **new website** using **Github-pages** for the DAMP programme, in a team of 8

EXTRACURRICULARS

Sports	FIDE-Rated District Level Chess Player since the age of 12 Taken professional coaching before and completed a year of training under National Sports Organization (NSO) at IIT-B (2019-20)
Management	Bagged the Best Manager Trophy in Institute Chess League leading a team of 16 (2020)
Volunteering	23 rd ISMIR (International Society for Music Information Retrieval), IISc Bangalore (2022) 7 th ICAER (International Conference on Advances in Energy Research), IIT Bombay (2019)
Hobbies	Reading: An avid reader ; have read over 40 non-fiction books in the last 2 years spanning various genres like science, history and philosophy to expand my knowledge and perspective Writing: I write blogs on Medium related to philosophy, life, values and well-being