SHREYAS NADKARNI

LinkedIn | Github | Personal Website | Gmail

About Me: I am an engineer by degree from IIT Bombay, trained in EE and AI-ML (23M, resident of Mumbai, India). I have changed my field to pursue research in Economics, which I am passionate about. I plan to pursue PhD in Economics in future and am currently looking for Predoc/RA opportunities to gain research experience.

Current Designation: Research Assistant at Department of Economics, IIT Bombay; working with Prof. Souvik Banerjee

EDUCATION

B.Tech in Electrical Engineering, **M.Tech** in AI and Data Science   **IIT Bombay** (2019-2024)
Interdisciplinary Dual Degree Programme (IDDDP): EE and CMInDS, IIT Bombay   **CPI: 9.20** (on a scale of 10)
Master's Thesis Title: Exploring the Correspondence Between Melodic Features and Gesture in Raga Alap Singing
Thesis Advisor: Prof. Preeti Rao

Intermediate (Class XII), Maharashtra State Board   Sathaye College, Mumbai (2019); Percentage: **90.15 %**
Matriculation (Class X), ICSE Board   Parle Tilak Vidyalaya, Mumbai (2017); Percentage: **98.33 %**

PUBLICATIONS

1. *Currently in progress*: **S. Nadkarni**, A. Putta, S. Banerjee, A. Hanchate, "Cognitive Health Among Middle-aged and Older Adults in India - the Role of Depression", Social Science and Medicine, 2025. (**submitted manuscript**)
2. **S. Nadkarni**, P. Rao, M. Clayton, "Identifying Melodic Motifs and Stable Notes from Gestural Information in Indian Vocal Performances", Transactions of the International Society for Music Information Retrieval, 2024.
3. **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 | ***Nominated for Best Paper***

RESEARCH EXPERIENCE

Research Assistant at Department of Economics, IIT Bombay | *Contract-based Work (Full time)*
Topic: Cognitive Health in Older Adults | *Guide: Prof. Souvik Banerjee, Economics, IITB*   *(December 2024 - Present)*

- Investigated the impact of **clinical depression** on **cognitive decline** in older Indian adults using the **LASI** dataset
- Implemented **linear regression** models in **Stata** to find the relative significance of several demographic covariates
- Studied the **mediating role** of sleep quality, ADL and IADL limitations in the link between depression and cognition
- Combined the analysis results with a thorough literature review of past work on cognitive decline thorugh **PubMed Central**
- Currently studying the impact of **education** on late-life cognitive impairment and **dementia** on the **HRS** panel data (USA)
- Studied econometric methods and concepts including implementation in Stata and research methodology in social sciences

Master's Thesis Project at Digital Audio Processing Lab, IIT Bombay | *During final (5th) year of Dual Degree*
Topic: Audio-Gesture Correspondence in Hindustani Classical Music | *Guide: Prof. Preeti Rao, EE, IITB*   *(May 2023 - June 2024)*

- Researched the correspondence between singing and wrist gestures of Hindustani Classical Music artists from audiovisual data
- Constructed data processing pipelines in **Python** with **multidimensional time series** of pitch contours and gesture keypoints
- Trained **SVMs** to classify notes (stable vs non-stable) from gesture keypoint time series achieving **F1-scores** upto **89.9%**
- Published the work at **ISMIR 2023** which got **nominated for best paper** and a **TISMIR journal paper** submission invite

Summer Undergraduate Research Project | *Offered by UG Academic Council, IITB, during 2nd year summers*
Topic: Genre Classification of Marathi Songs | *Guide: Prof. Preeti Rao, EE, IITB*   *(Apr - June 2021)*

- 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 | LINK

SCHOLASTIC ACHIEVEMENTS

- Obtained a **change of branch** to Electrical Engineering on grounds of **academic performance** in 1st year   *(2020)*
- Achieved an **All India Rank** of **1587** in the **JEE Advanced** examination (out of **224,000+** candidates)   *(2019)*
- Scored **99.87** percentile in the **JEE Main** examination | Recipient of the **KVPY** Scholarship in Science and Math   *(2019)*

INDUSTRY EXPERIENCE

Associate Data Scientist (Full-time) | ConvoZen.ai | *Conversational AI platform developed by NoBroker*   *(July - Nov 2024)*

- Training **speech recognition** and text formatting models for **conversational analytics** from agent-customer interaction data
- Carried out **speaker diarization** in multi-channel calls and automating scripts for model training and evaluation
- Worked with **Large-Language Models (LLMs)** to derive insights from call transcripts such as **conversational flow discovery**

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

- Implemented **speech transcription** using an **ASR** model trained on call data with **Voice Activity Detection (VAD)**
- Developed a real-time **chatbot** using intent identification and reply generation in **Python** and **Rasa NLU**
- Integrated them in an **end-to-end Python pipeline** for customer calling with a seamless conversational experience
- Received a **pre-placement offer (PPO)** for a full-time position for exceptional performance in the internship

COURSE PROJECTS DURING UNDERGRAD

Organizational Role Stress in Employees   *(November 2023)*

Managerial Psychology (HS 635) Course Project | Instructor: Prof. Pooja Purang, HSS, IITB

- Collected responses to a questionaire* from over **40 respondents** between ages 20 and 30 regarding **role stress** in their work due to five factors: **Personal Inadequacy**, **Self-Role Distance**, **Inter-Role distance**, **Role Ambiguity**, **Role Overload**
- Analyzed the responses to assess and compare levels of these factors contributing to stress in corporate and academic settings
- * Questionnaire was chosen from the book **"Psychology Applied to Modern Life"** by Pulver and Weiten

Time Series Forecasting using Transformer Attentional Copula (TACTiS)   *(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 such as **S&P 500**, **Dow Jones Industrial Average**, **Russel 2000**, **Nikkei 225**, **Wilshire 5000** from 2001 to 2020, in a team of 2
- Compared the forecasting performance on each time series using the **CRPS** metric as done in the original **ICML paper**

Global Economic Freedom and Happiness Data Analysis   *(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, Analytics, AI-ML	Programming for DS, Introduction to ML, Deep Learning Theory and Practice, Decision Analysis and Game Theory, Distributed Optimization in ML, Speech Processing, Image Processing, Wavelets
Electrical Engg.	Digital Signal Processing, Probability and Random Processes, Advanced Topics in Signal Processing, Music Analysis through Computing, Foundations of VLSI CAD, Testing and Verification
Computer Science	Computer Programming and Utilization, Algorithms and Complexity, Automatic Speech Recognition
Mathematics	Calculus, Linear Algebra, Complex Analysis, Differential Equations
Social Sciences	Intro. to Psychology, Environmental Studies, Managerial Psychology, Moral and Political Philosophy
Economics	Economics, Industrial Economics, Behavioral Foundations of Decision Making (Audit Course)

EXTRACURRICULARS

Sports	**FIDE-Rated** District Level **Chess Player** since the age of 12 | Taken professional coaching during school and 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	23rd **ISMIR** (International Society for Music Information Retrieval), IISc Bangalore *(2022)* 7th **ICAER** (International Conference on Advances in Energy Research), IIT Bombay *(2019)*
Hobbies	**Reading:** An **avid reader**; have read over **80 books** in the last 3 years spanning various genres like fantasy fiction, science, history, psychology and philosophy. Also an active member in online book clubs. **Writing:** I write blogs on Medium related to philosophy, life, values and well-being