Shreyas Nadkarni

Email | Website | LinkedIn | GitHub

Profile Summary

Research Assistant in Economics at IIT Bombay with experience in health economics; interdisciplinary empirical research combining data science with social sciences. Strong quantitative background with a dual degree in Electrical Engineering and Artificial Intelligence & Data Science from IIT Bombay. Aspiring to pursue a PhD in Economics with a focus on development, education, mental health and related topics.

Research Interests

Development Economics
Health Economics; Mental Health
Economics of Education
Economics of the Elderly; Ageing and Cognition
Applied Econometrics

Education

Indian Institute of Technology Bombay 2019–2024
B.Tech in Electrical Engineering; M.Tech in Artificial Intelligence & Data Science
CPI: **9.20/10**
Master's Thesis: *Exploring the Correspondence Between Melodic Features and Gesture in Raga Alap Singing*
Advisor: Prof. Preeti Rao

Class XII, Maharashtra State Board (Sathaye College, Mumbai) 2019
Percentage: **90.15%**

Class X, ICSE Board (Parle Tilak Vidyalaya, Mumbai) 2017
Percentage: **98.33%**

Research Experience

Research Assistant, Department of Economics, IIT Bombay Dec 2024 – Present
Supervisor: Prof. Souvik Banerjee

- Investigated the impact of **depression** on age-related **cognitive decline** using the **LASI** dataset (India) in **Stata**
- Studied the impact of **education** and **race** on cognition on the **HRS** panel data (USA) using **Bayesian methods**
- Currently studying district-wise literacy rates and cognition using LASI and census data from **SHRUG** data
- Examining literature on **frailty index** for the elderly and ML-based **predictive modelling** for dementia
- Conducting **societal cost-benefit analysis** of suburban trains for a sponsored project from Mumbai Railways

Master's Thesis Research, Digital Audio Processing Lab, IIT Bombay May 2023 – June 2024
Advisor: Prof. Preeti Rao

- Processed high-dimensional pitch and gesture time-series data from music videos in **Python**
- Trained **ML models** for classifying notes from gesture time series, achieving F1-scores up to **89.9%**
- Implemented **time series methods** of short-time autocorrelation, dynamic time warping and subsequence search

Undergraduate Research Intern, IIT Bombay Summer 2021
Advisor: Prof. Preeti Rao

- Extracted audio spectral features using **Python** from over 150 Marathi songs spanning 3 genres
- Constructed genre-classification ML models; achieving accuracies of upto **80%**
- Published as a **"Late-Breaking Demo" (LBD)** (forum for early research results) in **ISMIR 2022**

Publications & Working Papers

1. **S. Nadkarni**, A. Putta, S. Banerjee, A. Hanchate. *Cognitive Health Among Middle-aged and Older Adults in India: The Role of Depression*, medRxiv, 2025; DOI: 10.1101/2025.11.12.25340069 (Working Paper)
2. **S. Nadkarni**, P. Rao, M. Clayton. *Identifying Melodic Motifs and Stable Notes from Gestural Information in Indian Vocal Performances*, TISMIR, 2024; DOI: 10.5334/tismir.211
3. **S. Nadkarni**, S. Roychowdhury, P. Rao, M. Clayton. *Exploring the Correspondence of Melodic Contour with Gesture in Raga Alap Singing*, ISMIR 2023; **Best Paper Nomination**

Industry Experience

Associate Data Scientist, ConvoZen.ai (NoBroker) Jul–Nov 2024

- Worked on speech recognition, diarization, and NLP tools for conversational analytics
- Built model training and evaluation pipelines; analysed call transcripts using LLM-based methods

Data Science Intern, NoBroker.com May–Jul 2022

- Developed a speech transcription system based on automatic speech recognition and voice activity detection
- Built a Python-based chatbot; received a **pre-placement offer** for exceptional performance

Selected Coursework

Social Sciences: Economics, Industrial Economics, Behavioral Foundations of Decision Making (Audit), Introduction to Psychology, Managerial Psychology, Moral and Political Philosophy, Environmental Studies

Math: Calculus; Linear Algebra; Differential Equations; Complex Analysis

Data Science: Programming for Data Science; Introduction to Machine Learning; Deep Learning Theory and Practice; Decision Analysis and Game Theory; Distributed Optimisation and Machine Learning

Electrical Engg: Probability and Random Processes; Advanced Topics in Signal Processing; Wavelets

Selected Academic Projects

Multi-morbidity and Depressive Symptoms in Indian Adults July 2025
Empirical Methods in Policy Evaluation (GIAN Workshop at IIT Indore)

- Replicated the empirical results of Singh et al. (2022, Scientific Reports) on the association between multi-morbidity and depressive symptoms using **propensity score matching** on the LASI data using **Stata**

Organizational Role Stress Study Nov 2023
Managerial Psychology (HS 635), IIT Bombay

- Collected and analysed survey responses from 40+ participants (ages 20–30) to quantify role stress
- Personal inadequacy, self–role distance, inter–role distance, role ambiguity and role overload studied
- Compared stress patterns between corporate and academic environments quantitatively

Time Series Forecasting using Transformer Attentional Copula (TACTiS) Nov 2022
Deep Learning Theory & Practice (IE 643), IIT Bombay

- Trained a transformer-based probabilistic **forecasting model** on global stock indices spanning 2001–2020
- Indices included S&P 500, Dow Jones, Russell 2000, Nikkei 225, Wilshire 5000
- Evaluated performance using Continuous Ranked Probability Score (CRPS), as in the original ICML paper

Economic Freedom and Happiness Data Analysis Nov 2020
Programming for Data Science (DS 203), IIT Bombay

- Conducted exploratory analysis of the **Economic Freedom Index** and **World Happiness Report** datasets
- Built predictive models (Lasso, Ridge, MLP regressors) in **Python** with grid-search to draw insights

Technical Skills

Programming: Python (NumPy, Pandas, Scikit-Learn, PyTorch), Stata, R (basic), MATLAB, C++

Tools: Jupyter, Linux, Git, LaTeX, MS Office

Methods: Econometrics, Regression Models, Causal Inference (basic), Machine Learning, Time-series modelling

Honours & Academic Achievements

- All India Rank **43**, Indian Statistical Institute MSQE Entrance Test 2025
- All India Rank **1587**, **JEE Advanced** (top 0.7% of 224,000 candidates) 2019
- **KVPY Scholarship** based on merit in Math and Science 2019
- 99.87 percentile (JEE Main), 99.96 percentile (MHT-CET) 2019
- All-India topper in 3 subjects (ICSE, Class X) 2017

Other Academic Experience

Empirical Methods in Policy Evaluation, a GIAN Course, IIT Indore 2025
Instructor: Prof. Kaushik Chaudhury, University of Leeds (UK)

CompMusic Workshop, IIT Madras 2022
Instructors: Prof. Xavier Serra (UPF, Spain), Prof. Preeti Rao (IIT Bombay, India), Prof. Hema Murthy (IIT Madras, India)

Teaching Experience

Teaching Assistant | Department of Mathematics, IIT Bombay *(Nov 2020 - Jan 2021)*
Course: MA109 (Calculus-I), Instructors: Prof. Ravi Raghunathan, Prof. Manoj Kumar Keshari

- Conducted online tutorial sessions in a batch of 40+ first year students for the course **MA109: Calculus-I**
- Moderated online lectures with 500+ students, proctored examinations and assisted the instructors

Academic Volunteering

ISMIR 2022, IISc Bangalore – Technical Volunteer

ICAER 2019, IIT Bombay – Volunteer, Energy Research Conference

Extracurricular Activities

Chess: FIDE-rated district-level chess player; NSO Chess at IIT Bombay.

Hobbies: Reading (books related to psychology, philosophy, history, economics); Writing essays on Medium.