Shreya Gupta

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Profile

Audio Machine Learning researcher specialising in Music Information Retrieval (MIR), with four years of prior studio experience as a producer and mix engineer in the Hindi music industry.

Education

University of Edinburgh, MSc. in Sound Design — Sep 2024 – 2025

- **Grade:** Distinction
- **Coursework:** Audio Machine Learning, Audio Programming, Max/MSP, Game Audio

Prayag University (Prayag Sangeet Samiti), MA in Hindustani Classical Vocals — Sep 2020 – May 2024

- Grade: First Division

Boston University, BA/MA in Economics and Mathematics — Sep 2015 – May 2019

- GPA: 3.72/4.0, Magna Cum Laude
- Coursework: Linear Algebra, Stochastic Processes, Probability, Differential Equations, Real Analysis

Research & Project Experience

Independent Researcher, Musik Hack — Dec 2025 – Present

- **Vocal Source Separation**:
  - Designed a lightweight separation architecture (DTT-informed), reaching 11+ dB SDR on vocals after four days' training on a single RTX PRO 6000; deployed in production on Musik Hack's web platform
  - Current research: lead/backing vocal separation for TV and karaoke track generation
- **Audio tagging**:
  - Built vocal and drum detection models (around 90% accuracy); diagnosed drum false positives on guitar strums as a mel front-end limitation shared across pretrained models
  - Fine-tuned MTG's OMAR-RQ self-supervised representations with a compact PANN-CNN-style classification head

Audio Consultant, DatamindAudio — Sep 2025 – Present

- Release testing for Refractalizer (synthesis plugin): preset design, identifying synthesis, state-restoration, and usability issues prior to release
- Designed a web platform, mapping user-facing controls to latent-diffusion generation pipelines (Stable Audio 3 and LORA blending)

Music RAI: Responsible AI in Sound (UKRI EPSRC-Funded), University of Arts London — Nov 2024 – Feb 2025

- Awarded £5,000 UKRI EPSRC funding for machine learning on under-represented musical traditions; curated and hand-labelled a dataset of 8,408 tabla one-shot samples
- Prototyped tabla stroke recognition in Wekinator (naive Bayes), mapping recognised strokes to MIDI drum events in Max/MSP for live tabla–drummer jugalbandi, performed at Rich Mix, London
- Subsequently extended into a coursework research project: trained a PyTorch CNN on chroma and MFCC features (97% stroke classification accuracy), added subdivision-level groove estimation from my MSc thesis and a swing-aware generation stage with a two-knob performance interface controlling variation and swing; presented at ADC 2025, Bristol

MSc Thesis - Groove Transfer System, University of Edinburgh — May 2025 - August 2025

- Built a meter detection system combining beat similarity matrices (mel, chroma, MFCC, CQT) with autocorrelation analysis and a ResNet18 fallback; 90% accuracy on a curated 20-track evaluation across common and odd meters, improving on madmom and BeatThis baselines
- Integrated the extracted structure into a Max/MSP interface for automatic synchronisation, sampling, and mixing of recordings

Hybrid Granulator - Audio Programming Project (JUCE, C++) University of Edinburgh — Jan 2025 - April 2025

- Built a granular synthesis plugin with delay-line feedback, probabilistic grain control, and stereo modulation

Dynamic sampling and creative composition, University of Edinburgh — Sep 2024 - Dec 2024

- Analysed the pitch, loudness and spectral centroid of a monophonic sample using FluCoMa tools
- Combined audio descriptors with procedural composition frameworks for generative electronic performance

Work Experience

Freelance Producer/Assistant Mix Engineer, Mumbai, India — July 2020 – July 2024

- Composed and produced original scores for Netflix (The Indrani Mukerjea Story), Disney+ (Star Wars: Visions), and independent films (Schirkoa: In Lies We Trust, A Terrible Beauty) shown at international festivals like Rotterdam and Visions du Réel
- Produced in Cubase and mixed in Nuendo; delivered mixed and mastered stems to directors and post-production teams

Performer as a Singer, Mumbai, India July 2017 – July 2024

- Performed for large audiences (100-2500) at corporate events (BMW), Rotary Club, and National Sporting events

Skills

- Python, PyTorch, Max/MSP, C++ (JUCE) · Cubase, Nuendo, Reaper

Conferences

- **ADC Bristol 2025** – *Tabla to Drumset: Translating Rhythmic Language through Machine Learning* (12 Nov 2025)
- **Alpaca - Algorithmic Pattern 2025**: *Translating Rhythmic Language*. Presented on 12 September 2025 in Sheffield

Publications

- Gupta, S. (2025). Tabla to Drumset: Translating Rhythmic Language. Proceedings of the First Conference on Algorithmic Patterns in the Creative Arts (Alpaca), Vol. 1. doi:10.5281/zenodo.17084424

Awards

- **Filmfare Award 2022: Best Background Score** – Tabbar (Sony Liv)

Languages

- English (fluent), Hindi (native)