Manaswi Mishra

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Objective

Research and Development position in the field of Artificial Intelligence and Digital Signal Processing in Music Science and Technology

- **Research interests:** Signal Processing, Speech Technology, Computer Music, Music Perception, Computational Creativity, Acoustics, Image Processing, Human Computer Interaction

Education

- **Universitat Pompeu Fabra** — Barcelona, Spain
  MS in Sound and Music Computing; 8.44/10 (pursuing) — Sept. 2016 – Sept 2018
  - Key Courses: Audio Signal Processing for Music Applications, Music Information Retrieval, Music Perception and Cognition, Advanced topics in Sound and Music Computing, Real-Time Interaction, Advanced Interface Design, Audio and Music Processing Lab.
- **Indian Institute of Technology, Madras** — Chennai, India
  B. Tech in Engineering Physics; **CGPA:** 7.4/10 — Aug. 2009 – July 2013
  - Key Courses: Speech Technology, Network and Systems, Analog and Discrete Time Signal Processing, Advanced Digital Signal Processing, Biomedical Electronic Systems, Machine Learning, Computational Neuroscience, Calculus, Linear Algebra, Graph Theory, minor in Economics, German.
- **DAV Boys School Gopalapuram (CBSE)** — Chennai, India
  CBSE Science with Computer Science Major; **Grade:** 95/100 — Aug. 2007 – Mar. 2009

Research Experience

- **Neural Synthesis and Timbre Style Transfer** — Barcelona, Spain
  UPF, Master Thesis (ongoing) — 2017-present
  - Researching deep learning techniques for timbre modeling using Google'e neural synthesis (nsynth). I shall be pursuing a framework for timbre style transfer and vector arithmetic within the context of nsynth auto-encoding of time domain sounds. Datasets working with - nsynth instrument dataset, urbanSound dataset.
- **Sonic Doodle - Composing tool using wii remote gestures** — Barcelona, Spain
  UPF — Summer 2017
  - Objective was to create a gesture based tool using Wii remote for composing constraint based music onto staff notation. Presented work at UPF CSIM and accepted at CMMR 2017 Matosinhos, Portugal.
- **Audio Steganography/Fingerprinting** — Bangalore, India
  Adorilabs Research Intern — 2015
  - Benchmarked techniques for Audio steganography and watermarking. Objective was to modify existing techniques, both temporal and transform based, for audio watermarking maintaining fidelity and maximizing payload.
- **Universal Synchrony Music Vol II** — CA, USA
  by Sarah Weaver (NY) — April 2014
  - Universal Synchrony Music vol II by composer Sarah Weaver was a cosmic multi-year telematic music project in collaboration with the **NASA Kepler Mission** and NASA art space resulting in a telematic concert. I was a part of the data formatting and interpretation for the same.
- **Polyphonic Music Transcription** — Chennai, India
  Guide : Prof. Hema Murthy, Dept. of CS, IITM — Jan 2013 - July 2013
  - Objective was to transcribe polyphonic genre independent music (including Indian classical music) using phase based retrieval techniques. Implemented using MIR exchange database in `Matlab`.
- **Acoustics of Indian Musical Instruments** — Chennai, India
  Guide: Prof. Ronojoy Adhikari, Institute of Mathematical Sciences (IMSc) — Summer - 2012
  - Objective was to analyze the `eigenspectrum of membrane instrument (Sarode)` using finite element analysis and holographic interferometry and extend the same for plate vibrations (Veena).
    ID 18095 : Proceedings of the Stockholm Music Acoustics Conference - 2013

Development/Creative Experience

- **Samsara - Interactive physics soundscape** Bulgaria
  Music Vision Award at Hackathon Nov - Jan 2017
  - Created a virtual interactive soundscape for multiple performers using OpenFrameworks (C++) and PureData. This won the Music Vision award at Bulgaria Music Hackathon. This project challenged the paradigm of collaborative composition and gesture based interaction. Also presented at CMMR 2017 Matosinhos, Portugal.
- **AdoriLabs** Bangalore, India
  Research Intern 2015
  - Developing signal processing techniques for analog audio, radio and over the air sound signals for reimagining audio.
- **Shazam Research Intern** Palo Alto, CA
  Guide: Avery Wang Summer 2014
  - Intern at the research team at Shazam for music information retrieval working with Avery Wang, founder and Chief scientist at Shazam.
- **Virtual Drums** Chennai, India
  IIT Madras Fall 2012
  - Part of the Envisage team at Shaastra 2012 developing a virtual band, especially drums. Implemented using strain based sensors for a gesture detecting gloves and shoes.
- **Robo World Cup, FIRA** Bristol, UK
  IIT Madras Dec 2011 - Aug 2012
  - Represented IIT Madras and the only team from India at FIRA 2012, iimage processing based Robot Soccer tournament/conference, in a team of 10 members as part of the image processing. Developed the visual interface using `OpenGL` and `OpenCV` libraries.
- **Asia Pacific Robot contest - ABU Robocon** Pune, India
  IIT Madras Sept 2010 - Mar 2011
  - Represented IIT Madras in Robocon 2011 Nationals, in a team of 20, finishing as quarterfinalists in an event of more than 50 teams all over the country. Developed autonomous robots as part of the electronics team.

Teaching and Management Experience

- **Music Director** CA, USA
  Stanford Raagapella 2014
  - Part of the Indian acapella ensemble at Stanford singing Baritone, and music director. Some highlights include performance with A.R. Rahman (LA), spring east coast tour.
- **Teaching Assistant** Chennai, India
  IIT Madras 2010 – Present
  - **PH1010: Introductory Physics** Responsible for conducting tutorial sessions for introductory physics and maths for freshmen at IIT Madras.
  - **Teaching for a social cause** : Worked with Sevalaya (NGO) to set up computers for under-privileged village schools. Joined Saarang 2013 for teaching vocals and guitars to under-privileged children as part of the social drive.
- **Robotics Coordinator** Chennai, India
  Shaastra 2011
  - Co-led a team of 6 in the Robotics competitions at Shaastra 2011, manual, autonomous and *image processing* competitions, responsible for setting, publicizing and organizing the events.
- **Invited Talks** Chennai, India
  IIT Madras 2015
  - **IIT Madras Music Club** : Invited to give an introductory overview to Music Technology and current research interests.
  - **Utkarsh FIITJEE 2015**: Invited as a special guest to the Utkarsh felicitations of bright high school students and freshmen at various IIT's.

Skills

- **Operating Systems and Softwares:** Proficient in windows, Linux, OSX, 8 bit AVR-controller environmentsC/C++, Python, LaTeX, Matlab, HTK Toolkit (Speech processing), OpenCV (Image processing), GetFEM (finite element analysis), gmsh (modeling), Pro Tools, AbletonLive (audio editing), Pure Data