Shreyan Chowdhury

Contact Information

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Research Interests

I am interested in creating technologies to extract information from and discover patterns in music, in order to better understand the pervasive nature of music across cultures. I am also interested in deriving insights from audio-visual data, intelligent music processing, and music informatics.

Education

B.Tech-M.Tech	Electrical Engineering, Indian Institute of Technology (IIT), Kanpur, India		8.0/10.0 (M.Tech) 6.6/10.0 (B.Tech)	2015
CBSE XII	Delhi Public School Ghaziabad, Vasundhara		92.6%	2010
CBSE X	Delhi Public School Ghaziabad, Vasundhara		93.8%	2008

Employment

Honeywell Technology Solutions Lab, *Product Design Engineer* — Jul 2015 – Present
Developing connected systems for smart buildings and smart homes. Currently working on detection and prediction of faults in heavy machinery using audio ("Aural Intelligence").

ST Microelectronics, *Engineering Intern* — May – Jul 2013
Developed low-cost power line communication for smart street lighting in cities.

Publication

Interspeech 2017, Stockholm, Sweden – Conference Proceedings — Aug 2017
Chowdhury, S., Guha, T., Hegde, R.M. (2017) Music Tempo Estimation Using Sub-Band Synchrony. Proc. Interspeech 2017, 3093-3096
http://dx.doi.org/10.21437/Interspeech.2017-1000

Research

Musical Tempo Estimation using Sub-band Synchrony — 2014 – 2015
M.Tech Thesis | Supervisor: Prof. R. Hegde (Dept. of EE, IIT-Kanpur).
- Studied the applications of rhythmic information retrieval from music.
- Proposed a novel signal processing method for tempo estimation.

Industrial Projects

Aural Intelligence, *Honeywell Technology Solutions Lab* — Feb 2017 – Present
Built and deployed a system for detection and prediction of faults in heavy machinery using audio, with crowdsourced model training. Implemented edge-level feature extraction, and cloud-based unsupervised anomaly detection and supervised fault classification algorithms.

Image Signalling, *Honeywell Technology Solutions Lab* — Jun – Jul 2017
Developed a data transmission method between device with segmented display and smartphone with camera. Data was decoded from captured video stream using video and image processing.

Fuzzy Control, *Honeywell Technology Solutions Lab* — Nov 2015 – Mar 2016
Developed tool for simulation and testing of adaptive fuzzy control systems, thereby reducing test cycle time by up to 50%. Delivered talk on adaptive fuzzy control as a part of domain training.

Power Line Communication for Smart Street Lighting, *ST Microelectronics* — May – Jul 2013
Designed low-cost power line communication for smart street lighting by optimizing computation complexity for FSK demodulation. Demonstrated communication over 50Hz power line.

Academic Projects

Facial Keypoints Detection — Feb – Apr 2015
Course project for *Introduction to Machine Learning.*
Explored different detection approaches and obtained minimum RMSE using ConvNet.

Global Motion Estimation in Video Sequences — Mar – Apr 2014
Course project for *Digital Video Signal Processing.*
Enhanced 8-parameter motion model using hierarchical gradient descent.

Real Time Continuous Speech Recognition System Sep – Nov 2013
Course project for *Speech Signal Processing*.
Designed and demonstrated a speech recognition system in English on CMU Sphinx.

Restoration of Defocus and Motion Blurred Images Oct – Nov 2013
Course project for *Statistical Signal Processing*.
Improved restoration of images by using MAP to increase point spread function estimation accuracy.

Active Noise Control May – Jun 2012
Summer project. Supervisor: Prof. N. Tiwari (Dept. of ME, IIT-Kanpur).
Simulated adaptive control systems for noise reduction in duct-like spaces.

Awards and Achievements

Recognized for technical excellence by Honeywell Technology Solutions Lab:

- Received **Outstanding Achiever Award 2017** for my work in Aural Intelligence Dec 2017
- Received **Bravo Award** for implementing remote diagnostics using Image Signalling. Jul 2017
- Received **Star Award** for support in test automation. Apr 2017
- Received **Bronze Award** for driving key new product introduction to market. Dec 2016
- Received **Kaizen of the Month Award** for driving continuous improvement. Nov 2015

Received **Green Belt in Design for Six Sigma (DFSS)** for applying DFSS principles to execute and drive technology projects. Feb 2016

Achieved **99.87 percentile** in **Indian Institute of Technology – Joint Entrance Exam** (All India Rank of 637 out of about 485,000 candidates). Apr 2010

Relevant Courses

Speech Signal Processing | Statistical Signal Processing | Image Processing | Digital Video Processing | Fundamentals of Machine Learning | Digital Sound Design (Coursera certificate).

Technical Skills

Programming Languages (and relevant modules)

- Python (LibROSA, Scikit-Learn, Pandas) | MATLAB (MIRToolbox) | C/C++ | R | ChucK

Software

- FL Studio (Digital Audio Workstation) | Sonic Visualizer | R Studio | Microsoft Azure ML Studio IAR Embedded Workbench | Atlassian JIRA, Bamboo, Klocwork | Git | Tortoise SVN

Teaching

Teaching Assistant 2014 – 2015
Electrical Engineering Lab-I and Electrical Engineering Lab-II for 3rd year undergraduate students.

Extra-curricular Activities

Music Club, *IIT-Kanpur* 2010 – 2015

- Organized and performed in the bi-annual *Musical Extravaganza*, a celebration of cross-cultural and cross-genre music, for 5 consecutive years.
- Represented college in various inter-collegiate music competitions, and won accolades in Western Acoustic and Western Band competitions.
- Taught guitar at *Guitar Workshop* organized by the Music Club.

Electronics Club, *IIT-Kanpur* 2010 – 2012

- Designed and built a guitar audio effects processor using Atmel microcontroller.
- Represented college in various inter-collegiate electronics competitions.

Languages

English | Hindi | Bengali | French

Referees

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