Jatin Chowdhury

Audio Signal Processing Engineer

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Education

Stanford University, Center for Computer Research in Music and Acoustics *Palo Alto, CA*

M.A. in Music, Science, and Technology *Sept. 2018 - June 2020*

- Denning Family Fellowship for the 2018-2019 academic year.
- Relevant Coursework: Physical Audio Signal Processing, Time Frequency Audio Signal Processing, Digital Instrument Design, Spatial Audio.

University of Southern California *Los Angeles, CA*

B.S. in Electrical Engineering *Aug. 2014 - May 2018*

- USC Presidential Scholarship for outstanding academic achievement.
- Completed Minors in Physics and Music Recording.
- USC Renaissance Scholar certificate for excelling academically while pursuing separate fields of study.
- Relevant Coursework: Signal Processing, Circuit Design, Digital Logic, Electromagnetics, Software Design.

Experience

Persp3ctive VR *Los Angeles, CA*

Software/DSP Engineer *June 2019 - PRESENT*

- Developed and implemented audio effects for use in a VR audio production environment including:
  - Lowpass and highpass filters with smoothly varying cutoff frequency and rolloff rate.
- Improved performance of VR audio meters with input from a VST audio plugin.
- Built a CI/CD pipeline for multiple projects using Travis CI.

Audioworks Technologies *Toronto, ON*

Software Engineer *July 2018 - Dec. 2018*

- Member of of the SoundsUnite developement team: building a digital audioworkstation (DAW) using JUCE/C++.
- Developed and implemented DSP features for the application including panning algorithms, level detection, and "smart" track exporting.
- Developed UX features for the application.
- Developed file management features for the application, including integrating the file management system with the SoundsUnite web store.
- Presented work to engineering team, managers, and investors.

McGill Space Institute *Montreal, QC*

Research Trainee *May 2017 - Aug. 2017*

- Recipient of an Undergraduate Student Research Award from the National Sciences and Engineering Research Council of Canada.
- Member of the CHIME/FRB Working Group: building a software pipeline to detect Fast Radio Bursts (FRBs).
- CHIME is a telescope in British Columbia; has detected more FRBs in the Northern Hemisphere than any other telescope to date.
- Developed a "Flux Estimator" module for the CHIME/FRB software pipeline: Use incoming data from the telescope to estimate the intrinsic brightnes of the astrophsyical source.
- Contributed to science and unit testing frameworks for the CHIME/FRB software pipeline.
- Presented work for CHIME/FRB Working Group and CHIME/FRB Pipeline Gamma Release.

USC Viterbi Academic Resources Center *Los Angeles, CA*

Engineering Tutor *Aug. 2018 - May 2018*

- Tutored undergraduate engineering students in math, physics, and electrical engineering classes.
- Served as a tutor for the university chapter of the Society of Hispanic Professional Engineers.
- Trained new tutors in interacting with students and presenting material in a clear, concise, and cohesive manner.

KXSC Radio *Los Angeles, CA*

Disc Jockey, Jazz Director *Jan. 2015 - May 2018*

- On-air host and disc jockey for live jazz radio program "Jam Sessions".
- Co-host of live radio talk-show programs "Squaminous Science Hour", and "TeXulous Talk Show".
- KXSC Jazz Director tasked with researching, reviewing, and organizing jazz music for the station library.

iD Technology Camps *Denver, CO*
Instructor *May 2015 - Aug. 2016*
- Taught students age 12-17 programming in C++ and Arduino.
- Taught students age 6-12 in building simple robots using LEGO Mindstorm kits.

Skills

Programming Languages C/C++, Python, MATLAB, Faust, LaTex, Javascript
Tools/Frameworks Linux, Visual Studio, Git, Travis, JUCE, Audio Plugins (VST, AU, AAX, WAM)

Publications & Presentations

Real-Time Physical Modelling for Analog Tape Machines *Sept. 2019*
Proceedings of the 22nd International Conference on Digital Audio Effects (DAFx-19) *Birmingham, UK*
- Presented at the DAFx-2019 conference.
- Available on the DAFx Archives: `http://ant-s4.unibw-hamburg.de/dafx/paper-archive/`.

The CHIME Fast Radio Burst Project: System Overview *Aug. 2018*
The Astrophysical Journal *Vol. 836, No. 1*
- Co-authored with the CHIME/FRB Collaboration
- Available on the arXiv: `https://arxiv.org/abs/1803.11235`.

Web Audio Module (WAM) Distortion *Mar. 2019*
CCRMA Open House *Stanford, CA*
- Presented a distortion effect originally made in C++, then ported to Web Audio using the Emscripten toolchain.

Projects

NewMixer
Creator *Dec. 2018 - PRESENT*
- A unique digital audio workstation designed to break away from the traditional "virtual console" usier interface.
- Individual audio sources are visualized as sound sources in a room; the user can arrange the sources to create a mix with stereo width, and reverberative depth.
- NewMixer is currently a fully functional mixing tool, supporting saving, exporting, automation, plugin hosting and more.
- Documentation of NewMixer can be found on GitHub: `https://github.com/jatinchowdhury18/NewMixer`.

Chowdhury DSP
Founder, Engineer *June 2018 - PRESENT*
- Developed audio plugins including:
  - CHOW: A maximally truculent distortion effect.
  - How Much Spaghetti: A dynamic matrix of stereo delay effects.
  - Chowdhury Distortion: A "crunchy" distortion effect with adjustable stereo imperfection.
- Chowdhury DSP is currently collaborating with Tracktion to release plugins through the "Tracktion Presents" program.

Non-Uniform Perfect Reconstruction Filterbanks
Researcher *Mar. 2019 - PRESENT*
- Researched and developed a method for real-time filterbank analysis and synthesis, with perfect magnitude reconstruction and linear phase reconstruction.
- Implemented the filterbank in digital audio effect plugins including a Graphic Equalizer and real-time Noise-Supressor.
- Ongoing documentation can found on GitHub: `https://github.com/jatinchowdhury18/NUPR-Filterbanks`.

The SGUM (Squaminous Geometrically Uncanny Matrix) *Stanford, CA*
Creator *Mar. 2019*
- The SGUM is an expressive standalone drum machine, comprised of nine velocity-sensitive drum pads, with programmable samples and configurations.
- Designed and built from the SGUM from scratch, including drum pads, circuitry, frame, etc.
- Programmed firmware for the SGUM, which runs on a Teensy 3.6 microcontroller with an audio shield and uses embedded Faust processing.
- The entire process was completed in two weeks, and for less that $100 USD.
- Documentation for the SGUM can be found on YouTube: `https://www.youtube.com/watch?v=NOcPRS4LxpQ`.

Cassettes: A Web Audio Digital Audio Workstation
Stanford, CA

Contributor
June 2019 - PRESENT

- Developed digital audio effects using the Web Audio API and Audio Worklet.
- Effects include:
  - Delay: Stereo, Ping-Pong
  - Soft-Clipping Distortion
  - Modulation: Chorus, Flanger
  - Dynamics: Limiter, Gate

notGuitar
Los Angeles, CA

Researcher
Jan. 2018 - May 2018

- notGuitar is real-time timbral conversion system designed to process a guitar input signal to sound like a saxophone.
- notGuitar was implemented using a Texas Instruments DSK6713 DSP board in May 2018.
- Documentation for the project can be found on GitHub: `https://github.com/jatinchowdhury18/notGuitar`.

NoLava Recording Studios
Los Angeles, CA

Co-Founder, Audio Engineer, Technical Advisor
Aug. 2017 - July 2018

- Recorded, mixed, and mastered for artists of various styles including acoustic, electronic, rock, country, and punk.
- Installed, repaired, and maintained speakers, microphones, keyboards, amplifiers, and other musical equipment.