Jonathan J. Michelson

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Education

Carnegie Mellon University — Pittsburgh, PA
M.S. Music and Technology — Aug. 2017

Binghamton University, State University of New York — Binghamton, NY
B.S. Electrical Engineering | Cum Laude — May 2015

Experience

Electro-Harmonix / New Sensor Corporation — Long Island City, NY
Software / DSP Engineer — Aug. 2017 - Present
• Delivered award-winning products: Best Effect Pedal of 2018, Gear of the Year, Premier Gear, Editor's Pick, etc.
• Coded Python, MATLAB scripts for visualizing frequency responses, parsing hex data, emulating analog equipment
• Optimized embedded C audio effects (pitch, reverb, etc.) and firmware (SPI, DMA) for real-time Blackfin target
• Oversaw product life cycle: design and UX, sourcing, development, production, QC, maintenance, customer service
Skills: CrossCore, C, MATLAB, Python, NumPy, batch, git, Jira, DAWs, soldering, oscilloscopes, function generators

Bose Corporation — Framingham, MA
Applied Research Intern — Sep. - Dec. 2016
• Updated backend components across Bose's stack for administering web-based psychoacoustic listening experiments
• Designed the DSP blocks which sent the audio stimulus to users and prompted their response
• Ingested participants' responses to Linux server and database via Node.js and Chrome App user interface
• Extracted response data from server to synthesize 3D visualizations which augmented tech for clients: Mazda, Cadillac
Skills: MATLAB, Simulink, bash, Node.js, MongoDB, Linux, Chrome App, SVN, data visualization

Research

Automatic Guitar Tablature Transcription from Audio — New York, NY
Peer-reviewed presentation at AES Convention 145 — Oct. 2018
• Published (first author) two new machine learning methods to classify guitar string IDs from audio recordings
• Trained and tested using custom and standardized (RWC database) recordings of classical, acoustic, electric guitars
• Achieved state-of-the-art accuracy of 95% (F-score) for classical and acoustic guitars
Skills: MATLAB, LaTeX, git, maximum likelihood estimation, expectation maximization, Bayesian inference

Electromagnetic Field Test Structure chip for BEOL Metrology — Tempe, AZ
Peer-reviewed presentation at ICMTS 2015 — Mar. 2015
• Published paper after participating in summer program at the National Institute of Standards and Technology
• Developed FEA model to simulate the ability of scanning microwave microscopy to image buried wires
• Visualized animations of simulation results to 60 peers at end-of-summer symposium
Skills: COMSOL, FEA, SMM, electromagnetics, technical communication

Projects

LPC Beatbox Conversion - built system that learned beatbox recordings, converted to corresponding drum samples
Skills: LPC filters, MATLAB, note onset detection, Python, NumPy, DAWs

Adaptive Filter - implemented adaptive filter that learns and cancels noise on corrupted voice recordings
Skills: MATLAB, Python, NumPy

Movie Recommendation System - coded ML routine for predicting viewers' ratings of movies based on rating history
Skills: Python, NumPy, collaborative filtering, matrix factorization

NYC Citibike Classifier - predicting gender of cyclists using neural nets on data from millions of trips
Skills: Python, NumPy, Tensorflow, Keras, Jupyter, git