CURRICULUM VITAE

CONTACT

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EDUCATION

Stanford University
Stanford, California
2020 - 2022

M.A. Music, Science, and Technology

University of Southern California
Los Angeles,California
2015 - 2020

B.S. Electrical Engineering, Signal Processing
B.A. Art and Design, 3D Design

RESEARCH INTEREST

Virtual analog, physical modeling, digital filter design

RESEARCH EXPERIENCE

Master's Student
Center for Computer Research in Muisc and Acoustics
Stanford, CA
Sept. 2020 - Present

Pursued research projects focused in filter design and acoustic physical modeling. Developed technique for accurate discretization of analog filters based on conformal mapping techniques. Produced JUCE plugin with efficient acoustic model of a pipe organ using the Faust programming language.

DSP Engineering Consultant
Eventide Inc.
Little Ferry, NJ
Sept. 2019 - Oct. 2020

Researched virtual analog techniques with goal of digitizing A/D and D/A filter chain in vintage digital rack unit. Designed recursive filters using least-squares optimization to match measured transfer function of unknown circuit. Explored techniques to improve digital filter performance near Nyquist frequency, and published techniques in engineering brief.

Audio Engineering DSP Intern
Eventide Inc.
Little Ferry, NJ
June – August 2018

Analyzed a rare vintage guitar pedal to create a complete virtual model of the effect. Completed model and software implementation within two-month period to produce beta of program. Research and analysis of vintage pedal culminated in an accepted peer-reviewed conference paper and oral presentation.

Undergraduate Lab Intern
Signal Analysis and Interpretations Laboratory
Los Angeles, CA
May – August 2017

Worked under a PhD candidate in the Signal Analysis and Interpretation Laboratory at USC doing preliminary digital signal processing for psychotherapy research. Solely responsible for assessing sound quality of recorded psychotherapy session using MatLab. Created test cases to test and fine tune existing neural networks

PUBLICATIONS

Peer Reviewed Conference Publication

C. Darabundit, R. Wedelich, & P. Bischoff. Digital Grey Box Model of the Uni-Vibe Effects Pedal. *Proceedings of the 22nd International Conference on Digital Audio Effects (DAFx-19)*, Birmingham, UK, Sept. 2-6, 2019

C. Darabundit & J. Abel. Conformal Maps for the Discretization of Analog Filters Near the Nyquist Limit. *Proceedings of the 24th International Conference on Digital Audio Effects (DAFx20in21)*, Vienna, Austria, Sept. 8-10, 2021

C. Darabundit, J. Abel, & D. Berners. Truncated Spectral Discretization Based on Conformal Maps. *Manuscript submitted for publication*

Non-Peer Reviewed Publication

C. Darabundit and R. Wedelich, "Generalized Digital Second Order Systems Beyond Nyquist Frequency," in Audio Engineering Society Convention 149. Audio Engineering Society, 2020.

PRESENTATIONS

Oral Presentation. "Efficient digital waveguide synthesis of a pipe organ," 181st Meeting of the Acoustical Society of America, Seattle, Washington, USA. Dec. 1st, 2021.

Virtual Presentation. "Conformal Maps for the Discretization of Analog Filters Near the Nyquist Limit," DAFx20in21, Vienna, Austria. Sept. 8, 2021.

Virtual Presentation. "Generalized Digital Second Order Systems Beyond Nyquist Frequency," 149th AES Convention. New York City, New York, USA. Oct. 21-24, 2020.

Oral Presentation. "Digital Grey Box Model of the Uni-Vibe Effects Pedal," DAFx-19, Birmingham City University, Birmingham, United Kingdom. Sept. 4 2019

WORK EXPERIENCE

SPG Acoustics Intern
Apple Inc.
Cupertino, CA
June - Sept. 2019

Remote position. Worked in Special Projects Group (SPG) developing new technology using acoustic measurement and machine learning

DSP Engineering Consultant
Eventide Inc.
Little Ferry, NJ
Sept. 2019 - Oct. 2020

Remote position. Created library code for calculating gain of equalizer filters using C++ templates. Designed API to streamline digital filter implementation. Developed virtual analog model of A/D and D/A of vintage digital rack unit and integrated model into existing products.

Luxury Audio Engineering Intern
Harman International
Northridge, CA
May - Aug. 2019

Was primarily responsible for calibration and maintanance of three anechoic chambers on site to ensure testing validity. Updated turntables used in testing chambers, and designed system to interface with new turntable and legacy measurement systems over Ethernet. Manufactured custom PCB in-house for control modules using Altium and custom PCB CNC mill. Assisted with testing and evaluation of loudspeaker units recieved from oversea manufactures using Klippel. Following evaluations, was responsible for modification of crossovers and drivers to bring units within system engineer specifications.

Audio Engineering DSP Intern
Eventide Inc.
Little Ferry, NJ
May 2018 - May 2019

Architected and implemented an audio effect program to model a vintage effect pedal. Model was designed and optimized to run on Linux ARM Cortex-A9. Analysis of vintage effect pedal was performed in MatLab before being implemented in C++. Created variable triangle wave generator tool to aid modeling project and support other developement team projects. Improved existing spring reverberation program through parallelization of series biquad chain resulting in 11-16% increase in efficiency. Continued internship remotedly during undergraduate studies, ported legacy Motorola 56K Assembly tone deaf decoder software to C++ for use in updated emergency response decoder systems.

AWARDS AND HONORS

University of Southern California, Viterbi School of Engineering Dean's List
Fall 2015 - Spring 2020
University of Southern California, cum laude
Spring 2020
University Renaissance Scholar Scholarship
Spring 2020
Denning Family Fellowship for the Arts
Fall-Spring 2020

SKILLS

Languages

C, C++, Python, Matlab, Faust, Motorola 56k Assembly

Software

Adobe Illustrator, Adobe InDesign, Adobe Photoshop, Fusion 360