Jacob Sundstrom

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EDUCATION

UNIVERSITY OF CALIFORNIA, SAN DIEGO
PhD in Music
Concentration in Computer Music and Digital Signal Processing
Extension: Certificate in DSP
Expected June 2021 | San Diego, California
Cum. GPA: 3.95

UNIVERSITY OF WASHINGTON, SEATTLE
MM in Music Composition
December 2015 | Seattle, Washington
Cum. GPA: 3.7

UNIVERSITY OF CALIFORNIA, SAN DIEGO
BA in Music Composition, minor in Philosophy
June 2012 | San Diego, California
Cum. GPA: 3.83
Honors with High Distinction

LINKS

Github:// **woolgathering**
LinkedIn:// **jacobsundstrom**

SKILLS

DEVELOPMENT
SuperCollider • Python • MATLAB/Octave • C/C++ • LaTeX
SCM
Git
TARGETS
Linux • OSX • Windows

SELECTED AWARDS

Qualcomm Institute's Initiative for Digital Exploration of Arts and Sciences Artistic Residency, 2018 • Alcor Endowed Scholarship, 2015 • Stewart Prize, 2012 • Eagle Scout, 2006

RESEARCH INTERESTS

Real-time DSP • Data Sonification • Algorithm Development • Machine Learning • Sound Spatialization • EEG Signal Processing • Psychoacoustics

RELEVANT EXPERIENCE

DEPARTMENT OF MUSIC, UCSD | Graduate Student Researcher
September 2016 - present | San Diego, California

- Oversee the optimization, design, and implementation of robust real-time audio DSP algorithms for use in performative settings.
- Design and implementation of cutting-edge audio spatialization strategies in multi-speaker arrays.
- Algorithms in use include spectral modeling, statistical analysis, and frequency-domain processing.

SOFTWARE DEVELOPER | Freelance
August 2016 - present | San Diego, California

- **Roger Reynolds**: Redesign of *Four Real-Time Algorithms* (proprietary); optimization, redevelopment of spectral transformations of sound, code refactoring, redesign of UX, redesign real-time spatialization processing. Deployed in performances worldwide. *Watershed*; Redesign of signal processing and spatialization. (C++, SuperCollider, Python)
- **Alvin Lucier**: Redesign of DSP, spatialization, and UX for ***Slices***. Has been used worldwide. (SuperCollider)

DXARATS, UW | Graduate Researcher
March 2015 - June 2015 | Seattle, Washington

- Researcher in the Art + Brain Lab in The Center for Digital Arts and Experimental Media.
- Oversaw and designed paradigms for EEG analysis in real and non-real time for novice users.

SEESCAN, INC. | Sound Design Engineer
July 2012 - September 2013 | San Diego, California

- Led research and development of audio displays for ARM chipped devices. Implementation in C++ embedded systems.
- Research and development in conjunction with design engineers to develop acoustic chambers for use with piezoelectric film speakers in a new generation of Ridgid SeeScan SR series locators. Additionally aided in the development of amplifiers for piezoelectric film speakers.
- Audio interface on Ridgid SeeSnake devices. Shipped late-2013.

SELECTED OPEN SOURCE CONTRIBUTIONS

DBAP | Author (C++)

- Implementation and improvement of distance-based amplitude panning algorithm for sound spatialization.

BOIDS | Author (SuperCollider)

- Implementation of Craig Reynolds' Boids flocking algorithm for SuperCollider. 2- and 3-dimensional speed-optimized versions in addition to a generalized N-dimensional version.

STYLE FUSION USING NEURAL NETWORKS | Author (Python)

- Successful development of a style-fusion LSTM recurrent neural network algorithm. Includes parameterizations for custom "degrees of fusion" between the various sylistic constraints.