
Key Skills

Signal Processing: System Modelling/Simulation · Filter Design · Nonlinear Techniques · Sensor Fusion
Electrical Engineering: Analog and Digital Designs · PCB Layout and Fabrication · SPICE Modelling
Electrochemical Impedance Spectroscopy · Lumped Element Modelling
Biomedical Engineering: Cardiac Electrophysiology · Preclinical Study Design and Execution · Necropsy
OR Procedure · ECG/EKG Interpretation · Pharmacodynamics · Standards Compliance
Computer Engineering: Embedded Development · Real-Time Systems · C++ · Python (NumPy/SciPy)
General: Systems/Interdisciplinary Thinking · System Architecture Design · Technical Writing · Research
and Analysis · Data Visualization · Rapid Prototyping · Testing Strategies and Automation

Work Experience

Medtronic Senior Signal Processing Engineer, Cardiac Ablation Newton, MA 2025 – Present
· Led cross-disciplinary project to improve pacing capabilities without compromising patient safety, including electrical, chemical, mechanical, signal quality, and preclinical evaluation.
· Developed comprehensive systems models and simulations to assist product improvements.
· Designed and fabricated fixtures to improve product testing, diagnostics, and development.
· Implemented standardized preclinical testing protocols to improve study data reliability.
· Met with leading cardiologists to present research and best-practices, and receive product feedback.

Slime Child Audio Founder, Digital Signal Processing Engineer Boston, MA 2019 – 2025
· Designed, developed, and released acclaimed suite of cross-platform music production plugins in C++.
· Implemented, tuned, and optimized DSP algorithms incl. virtual analog and phase distortion synthesis.
· Worked with professional musicians to fine-tune user experience and sonic palette.
· Designed and fabricated consumer and professional analog audio processing hardware.

Future Audio Workshop Software Engineer / Graphic Designer (Contract) Boston, MA 2024
· Designed and built reactive visualizers for audio synthesis plugin in C++/GLSL.

Harebrained Schemes Senior Software Engineer Seattle, WA 2020 – 2023
· Led development for studio's first console video game release.
· Planned, implemented console support for Unity game: platform integration, certification, and release.
· Designed, built, and integrated multiple real-time asynchronous systems.
· Created automated error reporting pipeline, leading to significant reduction in bugs and test burden.
· Wrote extensive documentation on console development and requirements.

Bose Corporation Software/Firmware Engineer (Contract) Framingham, MA 2018 – 2019
· Created and maintained extensible software library for interfacing with audio hardware platform.
· Developed and implemented realtime sound spatialization algorithm.
· Assisted with embedded firmware development and testing.
· Designed product demos, use cases, and diagnostic tools.

Zapdot, Inc. Software Engineer (Contract) Cambridge, MA 2018 – 2019
· Developed novel object placement and manipulation algorithm for touch interfaces.
· Built custom physics simulation including stability prediction and movement assistance.
· Developed comprehensive product testing regimen, automated testing platform, and QA tools.

Planetary Resources Embedded Systems Intern Seattle, WA 2016
· Created ground control software for asteroid prospecting satellite, with emphasis on accident-prevention, reliability, and usability.
· Designed and implemented development, testing, and debugging toolset for aerospace platform.
· Developed and executed extensive manual and automatic testing routines.
· Designed, fabricated, and deployed a distributed IoT sensor node platform for agriculture applications.

Publications

C. V. Pines, “Real-Time Virtual Analog Modelling of Diode-Based VCAs,” in *Proceedings of the 28th International Conference on Digital Audio Effects (DAFx25)*, Ancona, Italy, Sept. 2-5, 2025.

Education

Northeastern University Undergraduate Degrees Boston, MA
BS Mathematics · BFA Media Arts · Game Design Minor · GPA: 3.92 (Summa Cum Laude) · CS Capstone
University Scholars Program · Honors Program · Meserve Award for Creative Excellence · Prototype
Grant Recipient · Indie Game Showcase Award · American Institute of Aeronautics and Astronautics

École Polytechnique Fédérale de Lausanne Continuing Education Lausanne, Switzerland
Completed 10-week graduate-level Digital Signal Processing course (with distinction)