Victor Shepardson

Researcher

victor-shepardson.github.io

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Education

University of Iceland / PhD candidate, Cultural Studies
September 2021 - present, Reykjavík, Iceland

In a joint arrangement with the school of humanities and the Intelligent Instruments Lab at the Iceland University of Arts.

Dartmouth College / MA, Digital Musics
September 2014 - June 2016, Hanover, NH, USA

Coursework including computer music composition, animation, psychoacoustics, music information retrieval, data visualization, machine learning and deep neural networks.

University of Virginia / BA, Computer Science
August 2010 - May 2014, Charlottesville, VA, USA

Highest distinction, Phi Beta Kappa. Undergraduate thesis on procedural texture synthesis in computer graphics. Coursework including computer graphics, computer music, and programming languages.

Master's Thesis

ABSTRACT/CONCRETE: An Audiovisual Synthesizer.
Professor Michael Casey, Associate Professor Jodie Mack, and Assistant Professor Ashley Fure

This thesis presents original work in generative audio-video. In it I describe the theory and implementation of a software synthesizer called ABSTRACT/CONCRETE, in which high resolution digital video feedback is coupled to an audio-rate multi-agent system and exposed to interactive control. I present *AVFB#3* and *CHERUB* as fixed works derived from interaction with the system.

Work Experience

Ntrepid / Machine Learning Engineer

2019 - 2021

Research & development of deep neural text-to-speech and vocoding systems. Reproduced and extended numerous state-of-the art methods in pytorch. Topics including variational autoencoder, normalizing flows, and time-frequency reassignment.

MyBliss / Contractor

2017 - 2018

Multiple hat-wearer: statistics, backend, product, data engineering for a smart journaling app. Analysis with Python, backend with nodejs, MySQL, and mongodb.

Locurity / Contractor

2017

Python development, research and data visualization for a statistical anomaly detection system. Tools including AWS, bokeh, matplotlib, scikit-learn, and pytorch.

Freelance / Developer

2014 - Present

- Hacked ML speech-synthesis algorithms and installed video equipment for *Deviant Chain*, a multimedia project with Stefan Maier and Alan Segal presented at Ultima 2019 in Oslo.
- Developed a Max/MSP speech-to-control voltage converter for a performance of Robert Ashley's *The Double* planned by Max Eilbacher.
- Licensed generative video software for the Synesthesia music visualizer platform to Gravity Current and individuals.
- Developed a concert telephony system using AWS and Twilio for composer Nathan Davis's piece *a Sound uttered, a Silence Crossed* (2014)

Dartmouth College / Teaching Assistant

2015 - 2016, Hanover, NH

Graded for Machine Learning with Lorenzo Torresani. Office hours and Ableton Live support for Intro to Sonic Arts with Ashley Fure. Live sound for numerous musical performances.

University of Virginia / Teaching Assistant

2012 - 2014, Charlottesville, VA

Grading and labs for Computer Architecture with Stankovic. Grading for Discrete Math with Soroush. Grading and office hours for Algorithms with Shelat and Computer Graphics with Tychonievich.

Arqball LLC / Research Intern

Summer 2013, Charlottesville, VA

Researched algorithms for editing 360° product photography and developed a web application using Google's native client platform.

Other Experience

Researcher / Berryville Institute of Machine Learning
2019 - 2021

Founding member of a weekly reading group investigating the intersection of machine learning, software security, artificial intelligence and fairness. We have published in IEEE Computer; received a grant from Open Philanthropy; hosted guest speakers; and made our work publicly available at berryvilleiml.com

Presentations & Performances

Living Art Museum / Performance
March 2023, Reykjavík
Improvisation with sonic batons with Majella Clarke and Nicola Privato

Mengi / Performance
September 2022, Reykjavík
Computer-processed no-input mixer and modular synth duo with Bob Hermit

Embodied AI Workshop / Talk
November 2022, University of Oslo and online
Short talk about studying the Notochord generative MIDI model with methods inspired by micro-phenomenology

Moving Strings Symposium / Talk
December 2021, Iceland University of Arts and online
Live demonstration of no-input mixing board and SuperCollider

Hybrid Live Coding Interfaces / Talk
November 2021, online
Presentation of sound seed automata, an interface for programming sound with sound implemented in SuperCollider

Sonic Fluidities / Video Projection
March 2018, UCSD (remotely)
Algorithmic video accompaniment for keynote performance by Clara Latham/New Pope

Musical Metacreation at ICCC / Demonstration
June 2016, Paris, France
Audiovisual Synthesis with ABSTRACT/CONCRETE

DAX 2016 / Installation
May 2016, Hood Museum, Dartmouth College
Halting Problem for Turing machines, TVs and speakers

International Computer Music Conference / Composition
October 2015, Denton, TX
Studies In Being Alive I-III for fixed media.

DAX 2015 / Installation
May 2015, Dartmouth College
Living Lattice for digital video feedback.

Contemporary Music Ensemble / Performance

2014-2016, Dartmouth College

Performances in and around Dartmouth's contemporary music ensemble at venues including Spectrum NYC and Dartmouth's EYEWASH series and New Music Festival.

Solo / Performance

2013 - Present

Musical performance and video projection at venues including Out of the Blue Too Gallery in Cambridge, MA, Twisted Branch Tea Bazaar in Charlottesville, VA.

Publications

Shepardson, V., Armitage, J., & Magnusson, T. 2022. Notochord: a Flexible Probabilistic Model for Embodied MIDI Performance. In *Artificial Intelligence and Music Creativity.* Zenodo.

Franzson, D. B., **Shepardson, V.**, & Magnusson, T. 2022. Autocoder: a Variational Autoencoder for Spectral Synthesis. In *Proceedings of the International Computer Music Conference.*

Pelinski, T., **Shepardson, V.**, Symons, S., Caspe, F.S., Temprano, A.L.B., Armitage, J., Kiefer, C., Fiebrink, R., Magnusson, T. and McPherson, A., 2022, June. Embedded AI for NIME: Challenges and Opportunities. In *International Conference on New Interfaces for Musical Expression*. PubPub.

Armitage, J., Magnusson, T., **Shepardson, V**. and Ulfarsson, H., 2022. The Proto-Langspil: Launching an Icelandic NIME Research Lab with the Help of a Marginalised Instrument. In *International Conference on New Interfaces for Musical Expression*. PubPub.

McGraw, G., Bonett, R., **Shepardson, V**. and Figueroa, H., 2020. The Top 10 Risks of Machine Learning Security. *Computer*, *53*(6), pp.57-61.

McGraw, G., Bonett, R., Figueroa, H. and **Shepardson, V.**, 2019. Security engineering for machine learning. *Computer*, *52*(8), pp.54-57.

Shepardson, V., 2016. Audiovisual Synthesis with ABSTRACT/CONCRETE. *Proceedings of the 4th International Workshop on Musical Metacreation (MUME 2016)*

Sarroff, A. M., **Shepardson, V.**, & Casey, M. A., 2015. Learning Representations Using Complex-Valued Nets. (arXiv)