Nicholas Esterer
Curriculum Vitae

Information

Email: nicholas.esterer@gmail.com
Location: Montréal, Canada
Citizenship: Canadian
GitHub: https://github.com/mondaugen

Education

McGill University
January 2013 – August 2016
Master's of Music Technology (M. A.)
Cumulative GPA: 3.92
Thesis: "Audio Source Separation via the Grouping of Partials in the Sum-of-Sinusoids Model"

McGill University
2006 – 2011
Bachelor of Music (B. Mus.) Major in Composition, Minor in Mathematics,
Minor in German Language
Cumulative GPA: 3.74, Graduated with Distinction

Eberhardt-Karls-Universität Tübingen, Germany
2008 – 2009
Mathematics, Music Theory and German Language
(Exchange program through McGill University)

Coursera
September 2016 – October 2016
Probabilistic Graphical Models 1: Representation
January 2018 – April 2018
Machine Learning

Awards

Heritage Canada: Young Canada Works Grant 2012. Value: $6500
Emploi Quebec: Jeunes volontaires 2012. Value: $6750
CIRMMT research grant 2011. Value: $500
Baden-Württemburg Stipend 2008. Value: 2500 Euro
James McGill Scholarship 2007. Value: $1000

Skills

Software Development
Internal applications for industry: product testing, data collection.
Firmware: software connecting to physical hardware.
Optimized libraries: software tuned for a particular machine or architecture.

Signal Processing
Implementation of algorithms suitable for processing audio and music, from prototype to optimized code.
Experience with:

- Signal treatment: compression, limiting, noise removal.
- Speech and music processing: time stretching / pitch shifting, source filter estimation.
- Machine learning: polyphonic pitch detection using neural networks, audio source separation.
- Spatial audio: implementation of binaural transfer function spatialization.

Embedded Development
Developed embedded applications on ARM Cortex-M3 and Cortex-M4 architectures.
Experience with digital audio (I2S, MIDI/UART).

Distributed Computing
Construction of cloud services for audio DSP on Google Compute Engine. Offloading of computations to GPUs.

Publishing
Experience writing documents in Latex. Plot and graphics generation with MATLAB and matplotlib.

Programming Languages
8 years experience: C, Python, MATLAB/Octave, MaxMSP/PureData.
3 years experience: C++, SuperCollider.

Operating Systems and Development Tools
Advanced OSX and Linux user. Advanced bash and vim user. Debugging with gdb, lldb and valgrind. Version control with git. Some knowledge of awk, perl, sox and ffmpeg.

Natural Languages

English	Fluent (Native speaker)
German	Expert (10 yr. experience)
French	Good (7 yr. experience)

Music
Expert in traditional and modern music theory, professional score engraving, piano and guitar performance.

Experience

Software Development & Music Technology

Yamaha Corporation
August 2018 – December 2018
Music information retrieval and artificial intelligence research intern. Researched and implemented algorithms for piano transcription from audio recordings to MIDI data. Experience offloading algorithm runs to cloud services and GPUs.
***Technologies**: Python, chainer, numpy, cupy, CUDA, MIDI*

Adam Basanta
April 2018
Developed software for autonomously controlling EPSON scanner software on Windows machine. Software initiated scans and performed some editing (cropping, color correction) of resulting images.
***Technologies**: Python, pyautogui, autohotkey*

Audible Reality
August 2016 – July 2018
Developed DSP library for SoundAlive project. Designed, implemented and optimized algorithms for audio spatialization (3D sound) in C, working with audio engineer. Constructed DSP engine to run on Google Cloud Services via API using Ruby working with front-end developer. Prototypes written in Python using numpy. Realized MaxMSP object, iOS app and standalone application with in-house library and JUCE. Some use of Xcode for iOS development. Some use of Android Studio for Android development.
***Technologies**: C, C++, MaxMSP, JUCE, Xcode, Android Studio, Intel IPP, Apple Accelerate Framework, Google Cloud Services, Python, numpy*

The Montreal Assembly
June 2014 – July 2019
Software and driver developer on 856 for Zellersasn project. Conceived, designed and built prototype of audio effects processor (granular synthesizer, sequencer), working with circuit designer. Authored DSP and hardware driver code in C. Built prototypes and testing software in Python and Tcl using gdb and openocd. Built electronic circuit prototypes (on breadboard) of MIDI (UART) and audio codec. Integrated circuit connections to an ARM architecture microcontroller.
***Technologies**: C, Python, numpy, Tcl, openocd, gdb, MIDI, I2S, ARM Cortex-M4*

McGill University Department of Music Research
May 2015 – August 2015
Software tester of the Timbretoolbox, a library written in MATLAB for studying psychoacoustic descriptors. Supervised by Stephen McAdams and Philippe Depalle.
***Technologies**: MATLAB*

McGill University
January 2015 – April 2015
Course lecturer and teaching assistant. Lectured on creating new media applications using MaxMSP. Teaching assistant for courses on the MIDI, OSC, real-time control of digital signal synthesis and analysis, and DSP algorithms in C++ for musical signal processing.
***Technologies**: C++, OSC, MaxMSP*

Undefine Productions
November 2011 – December 2012
Developed C code for microcontrollers for sound installation artworks. Simulated sound installation using sound spatializing algorithms. Programming in C/C++ using openFrameworks. Developed installation controllers in MaxMSP and PureData.
Audio editing with Pro Tools.
***Technologies**: C, C++, openFrameworks, TCP/IP, MaxMSP, PureData*

Conferences

Nicholas Esterer and Philippe Depalle. On the design and use of once-differentiable high dynamic resolution atoms for the distribution derivative method. In Proceedings of the 20th International Conference on Digital Audio Effects (DAFx-20), 2017.

Savvas Kazazis, Nicholas Esterer, Philippe Depalle, and Stephen McAdams. Testing the Robustness of the Timbre Toolbox and the MIRtoolbox. In Proceedings of the Fourteenth International Conference on Music Perception and Cognition, page 1. ICMPC, 2016.