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Fredrik Wallberg

Audio Developer, Composer, Lecturer

I have more than 10 years of professional experience as a software engineer and have worked with a wide range of technologies and methodologies. I am especially interested in audio programming, machine learning, functional programming languages (e.g. Haskell, Clojure) and strategies for improving software correctness and reliability in larger projects.

As a composer, I explore the impact of technology on music in general and music composition in particular. My main focus and expertise is computer-assisted composition — modelling sounds and musical structures with code. My artistic interests have led me to explore the representation and automation of musical notation as well as algorithms for generative music. I studied composition and electronic music in Stockholm, Freiburg and Köln with Mathias Spahlinger, Orm Finnendahl and Brice Pauset. My music has been performed by, among others, Ensemble recherche (Freiburg), Ensemble Mosaik (Berlin), Ensemble Nikel (Basel/Tel Aviv), Jonny Axelsson (Stockholm), Lauren Redhead (London).

Relevant Experience

Lecturer, Berlin Institute of Musical Arts, (2026-)

- Teaching the course "Music and AI", an introduction to the history of machine learning and AI as applied to music. Student group consisted of a mix of bachelor and master students.
- Currently preparing the course "History of Electronic Music", covering the evolution of electronic music from both a technical and an aesthetic perspective.

Freelance Audio Developer, ElasticOSC (2025-)

ElasticOSC is an iOS port of the Mutable Instruments *Plaits* oscillator.

- Implemented DX7 patch import via sysex files
- Designed and implemented the C++ backend for a new modulation system featuring multiple waveforms and an arbitrary number of sources and destinations
- Extended the app with support for for MIDI Polyphonic Expression (MPE)

Senior Software Engineer, Pitch (2020-2024)

Pitch is a modern take on presentation software and a direct competitor to Powerpoint. I joined the company as a software engineer at an early stage and designed and developed multiple features spanning the entire stack.

- Designed and implemented several parts of the core editor functionality (Image cropping, Mouse interactions, Video uploads, Text editing)
- Continuous collaboration with product managers and designers, ensuring larger projects are both technically feasible and firmly anchored in user research
- Regularly interviewed and hired new team members
- Mentored and coached less senior team members

Senior Software Engineer, eHealth Africa (June 2015 – Jan 2019)

eHealth Africa is an NGO driving several projects intended to improve public health in West Africa. The projects are funded by the *Bill and Melinda Gates Foundation*, *UNICEF* and *Paul Allen Foundation*. The systems are intended to support and facilitate disease surveillance, vaccine follow-ups, contact tracing and mapping.

- Implemented complex frontend applications with offline capabilities
- Contributed important improvements to software testing and reliability
- Backend development with Python/Django, CouchDB, Postgres, Kafka
- Mentored and coached software development teams in Sierra Leone and Nigeria

Lead Developer of the "Algorithmic Composition Team" , Humtap Inc (August 2014 – April 2015)

Humtap Inc. was a San Francisco-based startup focusing on automated music composition based on stylistic preferences. Our stack included numpy, scipy and essentia.

- Designed and implemented substantial parts of the core technology, including overall system architecture as well as several algorithms for algorithmic music generation according to stylistic preferences
- Developed a configuration language aimed at non-technical domain experts (musicians, composers) which enabled its users to create data pipelines without writing code, combining outputs from machine learning processes with a growing library of hand-written constraints and generators
- Developed algorithms for deriving stylistically relevant chord progressions from monophonic input
- Advocated for and eventually implemented property based testing for critical parts of the system

Consultant, Philomelos GmbH (2013-14)

Philomelos was an online sheet music library aimed at creating high-quality scores for music teachers.

I was responsible for the implementation of an improved version of *musicxml2ly* – a program which parses and converts MusicXML to Lilypond musical notation. Technologies used: Python, XML, Scheme.

Education

- BA, Hochschule fur Musik, Freiburg im Breisgau (2012). Studied composition with Mathias Spahlinger, Orm Finnendahl and Brice Pauset. Studied electronic music with Orm Finnendahl
- Royal College of Music, Stockholm - Composition (2007-2008)
- Gotland School of Music Composition - Composition (2005-2007)
- Stockholm University - Sinology (2003-2004)
- Various courses at EMS (Elektronmusikstudion), Stockholm (2002-2003)

Computer Languages

Extensive professional experience software with Python, Javascript, C++, TypeScript and Clojure. Proficient in Haskell, Purescript, Elm, Common Lisp, SuperCollider.

Music and Audio Software

In my work, I regularly use the following programs and libraries:

- SuperCollider
- JUCE
- Max/MSP
- Lilypond
- OpenMusic
- Abjad
- z3 Theorem Prover
- essentia
- Finale, Sibelius and various other notation programs
- Various DAWs (ProTools, Ableton, Reaper etc.)

Speaking Engagements (selection)

- *Harmony, Rhythm and Form in Gerard Grisey's Vortex Temporum*. Lecture at the Central Conservatory of Music, Beijing, China (2012)
- *Microtonality in contemporary music*. Lecture at the Central Conservatory of Music, Beijing, China (2015)
- *A library for algorithmic music in Clojure*. Presented at the Berlin Clojure Meetup (2015)
- *Making Music Inside of Emacs*. Presented at the Emacs Berlin meetup (2016)
- *An Introduction to Metaprogramming in Haskell*. Presented at "Friendly Functional Programming" in Berlin (2019)

Music Journalism (selection)

- *John Cage @MACBA*. Published in Nutida Musik (Swedish Journal for New Music) (2010)
- *Donaueschinger Musiktage 2010*, Nutida Musik (2010)
- *Chaya Czernowin, "PNIMA"*, Nutida Musik (2010)
- *Harry Partch, "The Wayward"*, Nutida Musik (2010)
- *Darmstadt 2010 - Reflections*, Nutida Musik (2010)
- *Peter Ablinger: "Voices and Piano"*, Nutida Musik (2011)
- *1+1=1 (Pierluigi Billone)*, Nutida Musik (2011)
- *Interview with Marianthi Papalexandri-Alexandri*, Nutida Musik (2011)

Language Skills

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1. Swedish: Native
2. English: Highly Fluent
3. German: Fluent
4. Chinese: Intermediate