

# Russell McClellan

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## Summary

I'm a software developer with a career focus on building innovative products to inspire creativity in customers. I've contributed to over 20 new software product launches as a developer, tech lead, or architect, including software that has won an Emmy and software that applies deep learning to solve problems never solved before.

I have a collaborative, pragmatic approach to software development - I believe in using the best tool for the job. I have a track record of enabling teams to excel technically through mentorship and collaborative system design.

## Key Skills

- Development and productization of **machine learning** solutions, using **pytorch**, **Tensorflow** and **ONNX**, including edge deployment with **Tensorflow Lite** and custom code
- Deep professional experience creating software in **C++20**, **Typescript**, and **Python**, strong personal experience with **Rust** and **Haskell**
- Guiding teams to continuous improvement of practices and tools such as **codebase design**, **CI/CD**, **automated regression testing**
- Signal processing algorithm design and implementation for **audio effects**
- Designing APIs, systems, and libraries to enable teams to quickly create valuable features
- Communicating the needs and goals of engineering teams to non-technical stakeholders
- Developing robust and high quality **cross-platform**, **multi-threaded**, and **soft real-time** software
- Developing software for **Apple** platforms, **Windows**, **embedded Linux**, **bare-metal embedded**, **Linux-based servers** and **containers**, and the **web**
- Improving quality and adding new capabilities to large, pre-existing codebases
- Measuring and improving run-time performance of code
- Technical leadership for agile product teams

## Work Experience

2016-2023 Principal Software Engineer  
2014-2016 Senior Software Engineer  
iZotope, Inc., Cambridge, Massachusetts

## Technical System Design

I've been responsible for technical design of important systems that enabled teams to rapidly deliver novel features in cross-platform audio software, including:

- Deep learning driven audio analysis and processing
- Cloud delivery of signal processing and UI code for audio plug-ins
- Multithreaded audio analysis engine powering "assistant" features
- Protocols and APIs enabling communication between embedded web-based Typescript UIs and real-time audio processing algorithms in C++
- Inter-plugin communication protocols and APIs
- High-framerate audio metering engine with best-in-market temporal accuracy
- Behavioral Analytics reporting, enabling valuable insights about how customers use our products

## Team Enablement

- Provided frequent mentoring and technical guidance across all levels of the engineering team.
- Introduced or created developer productivity tools to the company, including automated C++ refactoring, static analysis and runtime sanitizers in CI, automated statistical analysis and regression testing of runtime performance in CI, and Python bindings to allow faster development of integration-level testing
- Acted as technical product owner of the "DSP Chapter", a working group of cross-team engineers dedicated to improving signal processing codebase

## Signal Processing

- Invented and co-invented numerous innovations in signal processing, enabling first-to-market product features

## Product Strategy

- Acted as the technical voice in cross-functional "Product Strategy Taskforce" responsible for setting strategic pillars for iZotope's music-focused products
- Participated as the technical member of a cross-functional discovery and prototyping team, leading to a new design direction for our assistive features, enabling improvements across our product line.

2009-2014    Software Developer, Mark of the Unicorn, Cambridge, Massachusetts

- Created and expanded tools for musicians on Mac and Windows using C++
- Led development on browser-based mixing board control app for audio interface hardware

2008        Software Intern, Line 6, Calabasas, California

- Contributed subsystems written in C for a portable sound recorder for guitarists

## Education

2009        B.S. in Computer Science, California Institute of Technology, Pasadena, CA. GPA 4.0

## Patents and Selected Publications and Presentations

- US Patent 10,972,065 [Systems and Methods for identifying and remediating sound masking](#)
- US Patent 10,635,389 [Systems and methods for automatically generating enhanced audio output](#)
- [A Practical Perspective on Deep Learning in Audio Software](#) Audio Developer Conference 2019
- [Case Study: Eliminating C++ Undefined Behavior, Plug-in Contract Violation, Intel Assumptions in a Legacy Codebase](#) Audio Developer Conference 2022
- DAFx20in22 [K.J. Werner, R. McClellan, Time-Varying Filter Stability and State Matrix Products](#)
- DAFx23 [S. Nercessian, R. McClellan, C. Goldsmith, A. Fink, N. LaPenn, Real-time Singing Voice Conversion Plug-in](#)

## More information

Please refer to the [extended online version](#) of this resume for further information, including discussion of selected open source and commercial projects.