

Matt Ingalls

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Summary

I am an iOS and macOS developer with a wide range of experience extending from network streaming and kernel extensions to audio visualization and user interface design. Although the majority of my experience has been developing audio and music applications, I am open to any position where I can be creative and tackle tough technical challenges.

Employment

Radio Ryerson Incorporated <thescopeatryerson.ca> [8/15 - 11/16]

Senior Software Engineer leading a small team developing a cloud-based, collaborative audio editing and mixing application. Architect of the entire system: from the back-end server implementation and API design to the client's networking, audio engine, and user interface. Server-side implementation is in Node.js with a MongoDB database. The iOS (Obj-C) client uses Grand Central Dispatch, NSURLSession, AVFoundation, and UIView animations with a unique "trackless" design. A Node.js chat server was also implemented with a macOS client for internal communication between team members.

Mejay <mejay.com> [12/14 - 3/16]

Lead macOS software engineer for this early-stage startup (incubated and hatched by the incite* design firm) centered around audio streaming. Implemented the Mejay Broadcaster: a macOS app (Obj-C) and kernel extension to capture system audio and stream to a server. Audio is encoded to AAC and transmitted over TCP via NSStreams. Other server communication is handled via NSURLSession. Audio monitoring uses programmatically allocated aggregate devices. Analytics of the stream are displayed in an interactive GUI. The application also interfaces Gracenote and RTMP streaming libraries. A streaming server prototype was also implemented in Node.js.

Voxer <voxer.com> [10/11 - 1/14]

Development and maintenance of the Voxer Walkie-Talkie iOS app, featuring live HTTP audio streaming. Major work included a complete rewrite of the app's audio-networking layer, which involved enhancing ASIHTTPRequest to stream live audio via CFStreams/NSStreams; a new CoreAudio/Audio Unit/Audio Graph/Audio Session implementation; a design and implementation of real-time file I/O classes using SILK encoding; design of a scheme utilizing the iPodTime audio unit to time-stretch live incoming audio for de-jittering the network stream (awarded US Patent #9118743); live audio waveform visualization; and voice-activated recording.

Other tasks included the design and implementation of a patent-pending system to automatically route the audio output signal (speakerphone/handset) based on proximity, gyroscope, and accelerometer sensor; various UI improvements and implementation; localization; conversion of SoftBank emoji characters; sound-design of audio notification tones; creation of a dynamic compressor for audio input; and various networking improvements.

The Blindsight Corporation <blindsight.com> [5/11 - 8/11]

Developed a client iPhone app for "Sight on Call", an on-demand assistance service for the blind, low-vision and elderly. The app communicated with a remote server, uploading GPS position, photos, and device status information. Data from the server was periodically downloaded and parsed through an XML parser.

Rogue Amoeba <rogueamoeba.com> [4/11 - 7/11]

Created a Cocoa-based sound file playback utility for macOS. Functionality included drag-and-drop files from finder, localized keyboard hotkey editor, file scrubbing, looping, and threaded file position display.

GVOX <gvox.com> [8/05 - 11/09]

Senior Software Engineer. Sole programmer responsible for cross-platform [C++ on Win32 and macOS] development, maintenance, and migration to modern technologies for the *Encore* and *MusicTime Deluxe* music notation programs and the *Master Tracks Pro* MIDI sequencer. Improvements included: macOS Universal Binary migration; Quartz/GDI+ migration; macOS CoreMIDI migration; unicode migration; MusicXML implementation; registration and copy protection; localization; countless other bug fixes, performance optimization, and feature implementations. Other duties included coordinating beta testing team, customer support, and supervising contract programmers.

Livid Instruments <lividinstruments.com> [7/05]

Created Max/MSP externals for querying ethernet card addresses for copy protection and Huffman coding compression.

Arboretum Systems [5/05 & 10/99 - 1/00]

Ported *RayGunPro* and *Ionizer* noise remover plug-ins to AudioUnit plug-ins. Designed and implemented a software synthesizer for the multimedia editing application, *HyperEngine-AV*. Written in C++, the synth featured unlimited polyphony, MIDI control, band-limited VCO, LFO, ADSR, filters with resonance control, user-selected samples, a user interface with real-time display, patch routing, and the ability to save patch files.

Bias <bias-inc.com> [9/04 - 2/05]

Performed various improvements and feature implementations to the multitrack audio recording application, *DECK*. Duties included: 24-bit and 32-bit support; audio file and playback upgrades; various GUI bug fixes due to a previous Carbon port; drag and drop support; and evaluation of AudioUnit implementation.

Cycling74 <cycling74.com> [9/01 - 7/04]

Implemented CoreAudio drivers for the OSX version of Max/MSP. Created *csound~*, a Max/MSP object interface to Csound. Created *Soundflower*, a macOS kernel extension that allows low-latency audio routing from any application to another. *Soundflower* was named a top new technology "certified hit" of the 2004 Winter NAMM show by *MIX Magazine*.

Blue Spike <bluespike.com> [4/99 - 2/01]

Cross-platform digital audio watermarking development in C++. Implemented audio fingerprinting scheme to reconstruct sound files that had been edited after watermarking; designed a compression scheme for watermarked data; implemented Quicktime video parsing for watermark preparation; MP3/AIFF file handling.

ShadeTree, Inc. [5/97 - 7/98]

Junior Software Engineer. Major projects included: *ScriptThing*, a macOS [C++/Powerplant] port of the Windows screenplay text editor; a macOS application for processing handwritten signatures on a WACOM graphics tablet; *tExtraction*, an Adobe Acrobat plug-in for Macintosh and Windows to intelligently extract text from a PDF file.

Self-Published Software

<sonomatics.com>

StudioLive AI Translator [2015]

A macOS app that converts TCP messages sent from a Presonus StudioLive digital mixer into MIDI and OSC Messages. The mixer's communications protocol was reverse-engineered from traffic captured with Wireshark.

In C Performer [Released 2014 in the AppStore]

An iPad performance instrument commemorating the 50th anniversary of Terry Riley's "In C". The app features an internal MIDI sequencer and a built-in synthesizer using AUSampler Audio Units. Uses a high precision real-time thread in conjunction with Grand Central Dispatch Queues for accurate MIDI output timing. UIView animation and custom UIControl sliders create a colorful and dynamic interface.

Transbay Creative Music Calendar [Released 2011 (updated 2014) in the AppStore]

An iPhone app to display the most current listings of this bay area new music concert calendar. Data is retrieved in XML from a server, and presented in a table view. Each listing includes a detailed HTML view, a map view, and an option to add the event to the user's calendar.

MIDI Sliders [Released 2011 in the AppStore]

An iPad app that sends MIDI Controller signals. Created in collaboration with a graphics designer Tom Dill, the interface includes various skins, from traditional to silly. Control signals are sent as pairs to achieve 14-bit resolution.

Aardvark Synth [Released 2010 in the AppStore]

An iPhone virtual analog synthesizer app that uses a multi-touch interface to simultaneously control modulators, envelopes, and other settings with dynamic visual feedback. Underlying architecture is a complete C++ synthesis toolkit designed to be used in a wide range of cross-platform applications.

MacCsound <csounds.com/matt> [1996 - 2010]

Supporter and developer for the Macintosh port of the ubiquitous open-source digital synthesis and signal processing application. Originally developed by Barry Vercoe [MIT Media Lab], *MacCsound* includes an interface written in PowerPlant running on Classic and OSX. It includes CoreAudio and CoreMIDI support, user editable GUI control/display objects, a text editor with syntax highlighting, multi-processing support, and allows simultaneous rendering by loading the Csound Kernel as a shared library. This version became the standard for musicians worldwide and has been featured in *Keyboard Magazine*, *Electronic Musician(x4)*, and two penned articles in *The Csound Book* [MIT Press]. Winner of *Electronic Musician Magazine's 2004 "Editor's Choice" Award*.

Education

Master of Arts Mills College, Oakland, CA [1996]

Paul Merritt Henry Prize | Alumnae, Hellman, Crothers, and Greer Scholarships | TA: Computer Music
Relevant Course Work: C, Macintosh Programming, Computer Graphics, Computer Music

Bachelor of Music University of Texas at Austin [1994]

Dean's List | Golden Key National Honor Society | Tuition Waiver Scholarship
Relevant Course Work: C, Fortran, Calculus, Linear Algebra, Computer Music