

# Andrew Russell

Musician and Software Engineer

[airussell.ca](http://airussell.ca)

[deadhead.russell@gmail.com](mailto:deadhead.russell@gmail.com)

[github.com/deadheadrussell](https://github.com/deadheadrussell)

---

## TECHNICAL SKILLS

### Software Development

- Strong understanding of developing device drivers for different types of hardware
- Extensive experience of audio and image signal processing in C/C++ and Matlab
- Good knowledge of computer graphics programming techniques

### Web Development

- Very strong client-side web application development skills (HTML, JavaScript and CSS)
  - Familiar with a number of server-side languages including Google Go, JavaScript (node.js) and Java
- 

## EDUCATION

**Carnegie Mellon University;** Aug 2013 - May 2016

*Candidate for Masters in Music and Technology*

### Automatic Detection of Skill Level in Musicians (Master's Thesis)

- Researched and developed a method to automatically detect the skill level of musicians in a recording
- Introduced two new audio features based on the entropy of rhythm and pitch
- Conducted a survey to correlate the results of the features with user labelled data

### Machine Learning for Signal Processing (18-797)

- Completed a group project on modelling musical articulation
- Recorded a training set of songs played in both a folk and a baroque style on the viola
- Synthesized songs had a distinct feel between the two models, but audio quality was poor

**University of Waterloo;** Sep 2008 - Apr 2013

*Bachelors of Software Engineering, Honours Software Engineering*

### Second Screen (Design Project)

- Developed an application for Android that identifies what TV you are watching
- Modified the open source audio fingerprinter Echoprint to return the timestamp of the match
- Designed the back end database that handles metadata for TV shows

### **Research Project** (SE 499)

- Investigated the use of the Stockwell transformation in audio fingerprinting
- Modified Codegen for Echoprint to use a Stockwell transformation
- Performed multiple tests against both algorithms and analysed the results

### **Computational Vision** (CS 484)

- Learned digital signal processing techniques for image processing
- Developed a program for recognizing and stitching images into a panorama
- Implemented a panoramic stitching program in Matlab

### **Introduction to Computer Graphics** (CS 488)

- Lectures gave a broad overview of many graphics concepts
  - Developed final project implementing flocking, L-System, terrain erosion and water rippling
- 

## **WORK EXPERIENCE**

### **Co-founder and CTO**, Nebulus, Pittsburgh, Pennsylvania; Jan 2014 - May 2016

- Developed an in-browser, collaborative audio editor for working on music recordings
- Designed a real-time audio syncing process to efficiently transfer audio projects in real-time
- Worked with users to design and develop product features for online music collaboration

### **Software Engineering Intern**, Pandora Media Inc., Oakland, California; Jun - Aug 2014

- Designed an algorithm to simulate ad impressions on Pandora's radio service
- Preprocessed past ad impression data using MapReduce
- Simulated changing how ads were served would affect ad impressions

### **Research Intern**, Primal Inc., Waterloo, Ontario; Sep - Dec 2012

- Investigated a new algorithm for scoring web content against concepts
- Designed a new algorithm for converting user queries into concepts and then synthesising new concepts
- Researched combining synthesis results together to store user intent over multiple queries
- Will be listed as a collaborator on multiple patent applications

### **Software Engineer Intern**, Microsoft Corp., Redmond, Washington; Jan - Apr 2012

- Ported a virtual surround sound processing library from Windows to an Xbox 360 device driver
- Improved CPU performance by over 750x and memory usage by over 5200x using a profiler
- Worked with testing engineers and program managers to ensure code quality and that it met the spec

### **Software Engineer Intern**, Google Inc., Mountain View, California; May - Aug 2011

- Added accessibility for low-vision and blind users to the Pepper Plugin API (PPAPI)
- Modified existing Native Client applications to work with the new PPAPI version
- Added accessibility to existing Native Client applications

**Software Engineer Intern**, Sybase iAnywhere, Waterloo, Ontario; Sep - Dec 2010

- Researched the possibility of replacing native mobile applications with web applications
- Developed a JavaScript library to create native quality mobile web applications
- Cloned a CRM native application as a web application, matching performance

**Software Engineer Intern**, Qualcomm Innovations Center, San Diego, California; Jan - Apr 2010

- Worked with the Symbian OS Multimedia Audio Team
- Designed and developed a physical device driver for the Windows emulator
- Wrote a debugging tool to log running processes on the target device

**Ground Segment Intern**, Canadian Space Agency, Saint-Hubert, Quebec; Apr - Aug 2009

- Launched an internal development application using Java, JSP and JavaScript
  - Wrote SQL queries for Oracle 10g Database
- 

## OTHER INTERESTS

### Music

- Perform, compose and record music on various instruments
- Composed a rock opera with demo recordings [ajrussell.ca/rock\\_opera](http://ajrussell.ca/rock_opera)
- Have played piano in multiple musical theatre performances
- Instruments include the guitar, piano, upright bass, drums, vocals and mandolin

### Sports

- Class athletic representative, organizing teams, liaising with the league and developing plays
- Captain of soccer, volleyball, ultimate frisbee and slo-pitch intramural teams
- Played many competitive sports including allstar teams in soccer and baseball