Aaron Justin Toews (Phoenix)

116 Santa Cruz St. 831-325-5241
Santa Cruz, CA 95060 phyrworks@gmail.com

I am a digital artist and an expert programmer specializing in interactive visual, electronic, and digital technologies. As a digital artist I am constantly pushing technology to the edge of what is possible. I have a wide range of knowledge of programming languages, methodologies and design practices, from object oriented programming and design, to web-based front end and back end design, to interactive media. I understand the way data flows, and that there is little difference between a stream of video, audio, or a text document except in how one interprets that data.

Summary

- Extensive experience with and knowledge of interactive media, design, methods, and implementation in a variety of contexts from theatrical settings to art installations, to interactive computer applications.
- Expert knowledge of object oriented programming and object oriented design methods.
- Strong experience with and knowledge of system architecture, programming concepts and languages, libraries, APIs, plug-in architectures, and tools, web and Internet protocols and languages.
- Skilled at building cross platform/cross language compatible applications, plug-ins and libraries.
- Accomplished at designing and implementing solutions to complex problems, skilled at focusing on details as well as reusability and broader application of solutions.

Technical Summary

Languages	C, C++, Objective C, Cocoa, Max-MSP-Jitter, HTML, CSS, PHP, JavaScript, Perl, SQL
Systems	Macintosh OSX, iPhone, Linux, Unix, Windows 95/98/NT/XP/Vista
Concepts	Interactive Media Design Methodologies, Motion Tracking Technologies, OSC, OOP, OOA/OOD, C++ Templates, GUI design, Video and Audio DSP, Networking, threads programming, regular expressions, UNIX shell programming, shared libraries
Networking	Web design and applications, web standards and best practices, Apache installation and configuration, Apache modules in C and C++, TCP/IP sockets programming (bind), client/server protocol design
Libraries	C++ STL, CodeWarrior PowerPlantX, OpenGL, Carbon, MacOSX Core technologies, Quartz 2D/3D, Quicktime, gd, ImageMagick, Max/MSP/Jitter plug-in API
Software	Xcode, Interface Builder, GCC, Visual C/C++, Borland C++ Builder, vi, grep, sed, Adobe Photoshop, Adobe After Effects,Word, Excel, Dreamweaver, Flash, Final Cut Pro
Hardware	Arduino, PIC(16F84A and others), OOPIC, motor controllers, digital electronics, digital projection equipment (familiar with Sharp, Sanyo, Epson, and Infocus projectors), various digital cameras, MAC (PowerPC and Intel), PC
Database API'S	**-** SQL database design, SQLite, MySQL, PostgreSQL, plpgSQL, libpq, libpq-C++, ODBC, flat file databases

Education

2005, BA in Art with a focus on Digital Art and Intermedia, University of California at Santa Cruz.

Experience

April 2009: Motion Tracking System for Musician Rick Walker

- **Designed a motion tracking system using a Wii Remote and infrared led's**
  - Commissioned to design a two and four point motion tracking system using infrared led's and an inexpensive Wii Remote for Rick Walker. The system allows the performer to warp and reshape the display of a super-imposed image from a projector using infrared led's attached to his hands and body. The current beta prototype will be used for music festival performances in the US and Europe in April and May of 2009.

April 2009: Christopher Ramirez' ColorBonita Remixed
Performed at UC Merced

- **Media design, including Interactive Media, Sequencing, Programming and Artistic Consulting**
  - Rebuilt Christopher Ramirez' ColorBonita project from the ground up. Collaborated with Christopher, Leaf Tine, Alana Perlin, and others to re-envision and expand the project with new media, and new focus. Revamped the technologies and media used in previous showings of ColorBonita, as well as creating new technologies for this show, including a "virtual spotlight" that uses a Wii Remote, new visualizations and more.

February 2009 – April 2009: Suggestions of Sensuality at Expressions Gallery in Berkeley, CA

- **VASynth Installation**
  - A multiple artist exhibition on the subject "Suggestions of Sensuality". I was invited to install my interactive VASynth, a live system that converts light and motion into sound. Was installed in a hallway that everyone had to walk through to see the exhibition. A simple yet effective visualization was included in addition to the interactive audio component.

January 2006 - Present: Freelance contracting and consulting services

- **Programming, technology, and artistic consulting**
  - Consulting services for individuals and businesses. My background as a programmer and an artist allows me to consult on a variety of projects where technology and art meet. From providing services to artists who want to incorporate technology, to businesses who need graphics programming, I provide professional help that covers a variety of needs.

August 2008: VJ for Reggae Rising Festival at "The Bubble"

- **VJ for late night after hours show at "The Bubble"**
  - VJ'ed for four nights, 12 am to 4 am at an outside stage and dance area. The setup included an interactive video component with video taken from hidden security cameras throughout the venue. Incorporated many custom effects including time manipulation, beat detection, 3D effects, interactive video techiniques, found video, pre-recorded video clips, and much more. The VJ rig and all effects were entirely of my own design. Programmed in a combination of Max/MSP/Jitter, OpenGL, GLSL, C and C++ objects.

2006 - 2007: Softly Spoken

Performed at several venues and times in Santa Cruz, CA

- **A Collaborative Performance with Leaf Tine**
  - This was a performance that featured audience participation and nonverbal communication, and the use of technology as a metaphor for magic. The performance used a video projection against the floor that incorporated "sticky light", a revolutionary new technology that I designed and programmed. "Sticky light" gave us the ability to track the positions and shapes of arbitrary objects within a projection surface, while lighting only the objects that it is tracking. I designed, programmed, and sequenced all the media and interactive effects using Max/MSP/Jitter and external objects in C.

March 2007 – LaLeeLee

- **Website design – Freelance contract**
  - Created video and and interactive media components for Laralee Whittles "LaLeeLee – Here and Gone" dance narrative project. Used various technologies – After Effects, Final Cut, Max/MSP/Jitter.

2007-2008: Consulting, Programming, and Technical assistance Color Bonita, a performance by Christopher Ramirez

- **Jitter and OpenGL programming**
  - Provided ongoing consulting, artistic, technical and programming assistance to UCSC Digital Arts and New Media (DANM) grad student Christopher Ramirez with the interactive media for his "Color Bonita" performance. Max/MSP/Jitter, OpenGL, GLSL, After Effects, Final Cut.

November 2006- December 2006: HereAfterHere website design for Tandy Beal

- **Website design – Freelance contract**
  - Designed, programmed, and implemented the web presence for an interactive performance called "HereAfterHere". Used dynamic HTML with CSS, Javascript, and PHP with a MySQL database. The website collects stories from the general public for possible inclusion in a theatrical production to be performed by Tandy Beal and others at the end of 2007. *http://www.tandybeal.com/hereafterhere*

April 2006- January 2007: E.G. Crichton's Artist Portfolio Website

- **Website design – Freelance contract**
  - Designed, programmed, and implemented a portfolio website for the artist. Used dynamic HTML with CSS, XML, Javascript, and PHP. The website includes a "site creator" that allows the artist to add to and update the website dynamically. *http://danm.ucsc.edu/~phoenix/eg*

June 2006: Doctor and Janitor, a Performance for the Spring Electronic Music Concert, UCSC

- **A Collaborative Performance with Leaf Tine**
  - This was the first performance demonstrating a revolutionary new technology that I designed called "Sticky light". A blank projection screen has a camera and projector pointed at it. When the beam of a flashlight touches the screen, the light is held in place, or "sticks", on the screen. This is achieved through a complex form of controlled video feedback. Coded in Max/MSP/Jitter, and external objects in C.

June 2006: Consulting, Programming, and Technical assistance for a performance by Christopher Ramirez

- **Jitter and OpenGL programming**
  - Assisted UCSC Digital Arts and New Media (DANM) grad student Christopher Ramirez

with the creation of an audio visualizer for his thesis performance titled “Bearing Witness: Resiliency in the lives of (Homo)Sexual Latino Men”. Visualizer coded in Jitter and OpenGL.

October - November 2005: Psychological Prosthetics website

- **Website design and programming – Freelance contract**
  - Designed and programmed a site for an artist project by Dee Hibbert-Jones called Psychological Prosthetics. Coded in HTML and CSS.

June – July 2005: Updates to the artist Dee Hibbert-Jones Portfolio website

- **Website updates – Freelance contract**
  - Updated the artist portfolio site to add new sections, rewrote the layout to be more rational and easy to navigate, cleaned up badly formatted HTML and CSS code. Added CSS to some sections of the site. *http://deehibbert-jones.ucsc.edu*

May – June 2005: Passage – Irwin Scholars Exhibition, Sesnon Gallery, UCSC

- **Art Installation by myself**
  - This piece was a meditation on time and space. A long dark hallway was hung with long silk scarves, 4 per row, 7 rows deep about a foot apart for each row. Two projectors, one projecting from the front one from the back, were placed to project on the silk scarves. The projections were of found video, modified to give different sensations of the passage of time. The images projected through the silk, to meet and overlap in the middle of the room.

May 2005: Rituel III: Transfiguration – UCSC Recital Hall, Santa Cruz, Disney Hall, Los Angeles and Palace of Fine Arts, San Francisco

- **Multimedia Technical Assistant.**
  - Assisted Prof. Elliot Anderson with programming and artistic development of an interactive multimedia performance that was a collaboration between composer Hi Kyung Kim, the Korean dancer Aeju Lee, conductor Nicole Paement, percussionist William Winant and Elliot Anderson.
  - Completely redesigned the custom live interactive video and effects for a much more effective and powerful performance. Featured time shifting and shadowing of the dancers movements, as well as transforming her image to appear as if it was a charcoal drawing. Designed, programmed, and implemented all custom effects and sequencing of effects and video using Max/MSP/Jitter.

April 2005: The Train

- **Live Performance and collaboration**
  - A collaboration between myself Leaf Tine. This was a live dance performance, choreographed by Leaf and myself, featuring half a dozen dancers performing in front of an abstract video backdrop I designed in Adobe After Effects and Final Cut Pro.

April 2005: Dance Telematica – Lubricious Transfer

- **Interactive Media Design**
  - Lubricious Transfer was an interactive performance that took place live in New York and Santa Cruz, simultaneously. Images of the dancers in Santa Cruz were picked up live from cameras and transferred across the Internet2 to be projected on three screens behind the dancers in New York, and vice-versa. Dancers interacted with each other live from these widely disparate places.
  - Provided technical advice, support, and suggestions for the telematics. Designed and programmed live interactive media effects that were used to add backdrops as well as

transform the movement of the dancers. One of the many effects was used to make the dancers look as if they were watery creatures dancing on waves. Effects and sequences were programmed in Max/MSP/Jitter.

January 2005 – April 2005: Maintained the Art Departments E102 Mac lab

- **Mac workstation maintenance**
  - Kept the Mac lab in working order for art students taking digital arts classes. Updated and installed software, maintained hardware, installed drivers to interact with iCube and MakingThings controller hardware, updated Max/MSP/Jitter licenses, provided individual assistance to students.

September 2004 – December 2004: TA for Intro To Digital Media, Fall Quarter 2004, UCSC

- **Teachers Assistant**
  - TA'ed for two sections (40 students). Introduced students to concepts surrounding digital media and digital and electronic art. Taught basic programming skills. Students were required to create and maintain a website for their work, many of whom had never programmed before. I required that all HTML and Javascript be hand-coded.

June 2004 – July 2004: Design of a "fake" dating site for a stage performance called "Leznet"

- **Website design for a performance**
  - Designed and programmed in HTML and CSS. A fake, but working, dating site that was used in a performance by E.G. Crichton. Some screenshots of the site can be seen at *http://danm.ucsc.edu/~phoenix/eg/index.php?family=projects&genus=sitesituation&species=leznet*

June 2004 – July 2004: Rituel III: Transfiguration – Melbourne and Sydney Australia

- **Multimedia Technical Assistant.**
  - Assisted Prof. Elliot Anderson with programming and artistic development of an interactive multimedia performance that was a collaboration between composer Hi Kyung Kim, the Korean dancer Aeju Lee, conductor Nicole Paement, percussionist William Winant and Elliot Anderson.
  - Designed and programmed complex custom live interactive video effects, that used a complex arrangement of video cameras, feedback and projection, and video sequences that were projected behind the dancer, whose movements would alter or otherwise affect the display of the video. Programmed and sequenced in Max/MSP/Jitter.

May 2004 – "1984", Stage production at the Experimental Theater, UCSC

- **Interactive Media Design**
  - Designed and programmed a live video surveillance system for the production. The system displayed live video of the performers and the audience onto screens throughout the theater. Each screen featured an overlay that displayed a logo of Oceania, and various surveillance related imagery, and an image from one of several cameras that were hidden throughout the stage and mezzanine. Also provided integration of all the various visual media elements of the show. Programmed and sequenced using Max/MSP/Jitter.

March 2004 – Can You See What I am Hearing?

- **Installation at Open Studios, UCSC**
  - Designed and programmed an interactive video installation that used video feedback to generate sounds based on the movement of people within the space. Light and movement were converted into data for a fft filter that modulated an audio signal. The

net effect was that peoples movements controlled the sound. Programmed in Max/MSP/Jitter and C.

July 2001 – August 2009: Astrograph Software (periodic)

- Created an iPhone port of their Desktop application
- Porting of their TimePassages application from PPC to Carbon, and updated legacy code to reflect current C++ standards.
- Cross platform development between Windows (Borland C++ 6.0), Mac (PowerPlant/Carbon) and Unix.
- GUI development for new features in C++, including updates of graphics to reflect new technology (OpenGL, Quartz 2D/3D).
- Addition of new features.
- QA, and general consulting.

July 2001 – December 2003: ProsperPoint – Freelance contract

- Graphics library routines in C and C++ for Unix based distributed application.
- Code review of Perl CGI scripts for Astrobuilder server application.
- Implemented client side GUI application in HTML and JavaScript for Astrobuilder server.

October 1998 – June 2000: Senior Software Engineer, SRK Systems.

- Project lead for a custom, multithreaded, email server that used distributed networking and custom database and networking protocols. Designed a C++, STL compatible thread library, based on pthreads at its core, for use with the email server.
- Distributed network architecture for Internet portal and ecommerce backend server solutions.
- Designed and implemented new client/server protocols using TCP/IP sockets for custom ecommerce solutions and internal applications.
- Apache modules in C and C++ for custom portal sites, ecommerce solutions, and user authentication.
- Designed and implemented extensive libraries in C++ that maintained compatibility with the STL, including overloading STL memory management routines to allow compatibility with the Apache memory manager, custom client libraries for PostgreSQL, and class wrappers for IP sockets (bind), and for threads (pthreads).
- Designed, coded, and maintained SQL databases and custom plug-in for PostgreSQL server in C and C++ as well as server side shell scripts for building customized databases.
- Designed databases and analysis tools for multilevel marketing firms.
- Customized versions of Netscape Communicator and Microsoft Internet Explorer for clients.

May 1997 – August 1998: Freelance contracting and consulting

- **Attitude Software (For Attitude Software I was compensated in non-voting ownership shares.)**
  - InstallShield installer and 3D Sound Engine Design for “3D Anarchy” in C, a product later sold to Adobe and currently downloadable from their website as “Adobe Atmospheres”.
- **Network Computers**
  - QA Engineering and QA Architecture for client and server application.

- **Liquid Audio**
  - QA Engineering and Architecture and code review for their Liquid Music Server.
- **American Presidents Lines**
  - Wrote a Bill of Lading Networked Print Server in C. This included many technical challenges to address legal issues about Bills of Lading, namely that there can only ever be one copy of any Bill of Lading, electronic or otherwise.

July 1996 - April 1997: Game Developer, Rocket Science Games.

- Physics and collision detection engine in C++, low level optimizations for speed using Pentium Assembly and the MMX instruction set for the internal rendering loop of "V3O", and mathematical modeling of 3D objects for their "V3O" product using C++ and C. The "V3O" technology was transferred to Attitude Software and retitled "3D Anarchy", and then eventually sold to Adobe and packaged as "Adobe Atmospheres".

September 1991 - June 1992: Computer Lab Tech Support, Communications and Technology Services (CATS) at the University of California, Santa Cruz.

- Provided phone and in lab technical support for students, alumni, and faculty.