

# Aaron Hightower

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## Objective:

It's probably time for me to make another game. It's been a while.

## Skills:

C/C++

Windows, PC/DirectX, OpenGL,  
Console and Embedded system development,  
Linux, Perl, Awk, tcsh, bash,  
File compression, cryptography, game toolchains,  
build processes, cvs, svn, Perforce, Git, gvim  
ffmpeg C/C++ API, streaming, networked systems

## Experience:

### IGT, Las Vegas, Nevada – June 2018 – September 2018

Short contract working to assist IGT in monetizing patent 8992318.

### Comcast Innovation Center, Sunnyvale, California – August 2016 – June 2018

Working contract in Sunnyvale, California for Comcast Innovation Labs. Research and development for long-term time-horizon for the cable television industry. Experience gained with C++/OpenGL API's for ffmpeg and the playback of movies in an efficient manner. Also research into Machine Learning and/or Natural Intelligence, but no significant development of new software, just broad understandings of the technology from a high level.

### NanoTech Gaming, Las Vegas, Nevada – November 2013 – June 2016

Opened the Las Vegas office of NanoTech Gaming and led development for Vegas 2047 and CasinoKat, the first two true "skill-based gambling" products. Filed patents for technology behind mixing skill based video games with traditional casino gambling. Worked with the Association of Gaming Equipment Manufacturer's to change laws enabling skill-based gambling in Las Vegas.

### IGT, Las Vegas, Nevada – March 2010 – October 2013

The Innovation Labs at IGT was a small group of individuals who help the company explore new ideas and technologies aimed at creating the most entertaining and profitable gaming products in the world. My work here consisted of many tasks including research, development, and presentation of new technologies and methods for creating compelling video gaming products for the gaming industry.

### Self-Employed, Bay Area and Orange County California – May 2009 – February 2010

Jobs include efforts to port the PC version of Diner Dash 2: Flo on the Go for Empty Clip Studios in San Diego and programming pixel shaders to mitigate ghosting effects for 3d shutter glasses for Infinite-Z in Campbell California. Gained experience with RenderMonkey™ and HLSL and GLSL creating advanced pixel shader effects including multi-pass Guassian blur and other complex shader tasks for both HLSL and GLSL.

### Red 5 Studios, Irvine, California – April 2006 – February 2009

Responsibilities included vehicle physics programming, build scripts, Linux server setup and programming, evaluation and recommendations for hiring additional engineering and IT staff, low level input libraries, timing measurements and built-in tools for optimization of the rendering pipeline including pixel shader programming for texel density, and other modes to analyze depth complexity and triangle density per pixel.

### UltraCade, San José, California – October 2004 – March 2006

NTRA Breeders' Cup for coin-op. Networking and user interface programming. Lead Programmer for UltraPin. This project involved an I/O board with an accelerometer and did full emulations with tilt and nudging support of 12 original pinball games (including Attack from Mars, FunHouse, and PinBot). More experience with high quality fonts using Photoshop and texture mapped polygons to create dynamic text with beautiful glows and drop-shadows that are programmatically controlled.

**Naughty Dog / Sony, Santa Monica, California - July 2003 – October 2004**

Vehicle physics programming and gameplay programming on Jak3 (third in the series of Jak and Daxter games for the PS/2). All programming was done in Lisp.

**Pacific Coast Power and Light / THQ, Santa Clara, California - October 2002 - May 2003**

Gained experience with Metroworks Codewarrior for PS/2, Perforce, Cygwin. I was responsible for all physics programming for this street motorcycle fighting, exploration, and stunt game. I used parts of existing code from MXSuperFly for PS/2 as a framework for a new motorcycle physics model. Physics implemented within a tiny budget allowing for smooth 60Hz gameplay without sacrificing realistic feel or dynamic visuals.

**Tsunami Visual Technologies, Fremont California - December 2001 - October 2002**

Experience with Microsoft Developer Studio 6 and large PC-based game projects. Ported MechWarrior IV for coin-op play. I made significant gameplay changes to MW4 for Tsunami's proprietary coin-op motion platform, encouraging the player to get better in order to play longer. I created a level-building system specifically for fast-action coin-op play that allowed game designer to place AI and control AI parameters from an in-game custom editor. I modified DirectPlay network code in MechWarrior4 for coin-op linking, and implemented custom networking code to supplement DirectPlay and allow for typical countdown style arcade network linking. While at Tsunami I also assisted modification of Crimson Skies / PC for coin-op play.

**Atari Games Coin-op / Midway Games West, Milpitas, CA - September 1997 - December 2001**

Experience with local-area-network and wide area network linking. Rewrote networking routines to prevent link problems with original San Francisco Rush for San Francisco Rush The Rock / Alcatraz Edition. Wrote network functionality for gameplay and linking for wide-area-linking on Rush Wavenet. Rush/Wavenet was awesome and featured wide-area networked play between the Bay Area and the LA area with 50 arcades. Groundbreaking wide-area linked racing. Became the lead programmer for Rush 2049 and the Rush team. Rush/2049 was Replay Magazine's #1 rated deluxe coin-op title based on earnings for 5 months straight following its release. Made improvements to physics engine to allow more casual arcade gameplay for Rush 2049. Reprogrammed user interface using high quality fonts, glows, drop shadows, and other special effects. Learned font system using Photoshop to make beautiful and high speed font-textures for games by use of textured triangles. Implemented play account system storing mileage and other player bonus features for repeat play. Received multiple patents for software in Rush 2049. Patents awarded for keypad in conjunction with arcade game and free-game ghost car (beat the car, get a free game). Designed and implemented the Rush 2049 www high score system using SHA protected passwords for verification. I implemented visibility testing algorithm to allow automatic creation of spatially organized visibility lists to double the graphics performance in general allowing for 60Hz gameplay. Lead programmer for Rush 2049 Tournament Edition, and on Custom Car Club (later renamed Nitro City) for PS/2.

**Paradigm Simulation / Entertainment, Inc., Dallas, TX - August 1994 -- August 1997**

Designed and implemented many development tools and game content, including Animation Editor (Quaternion based, C++, X/Motif, Edits and Imports 3D Studio and Alias animations), file system (EA IFF'85), compression (lzw), and data conversion tools (C++/perl) for UltraVision game library, Mecha-Hawk character AI for PilotWings64, 3D particle effect, and many sound effects for PilotWings64. Implemented integrated game development system utilizing C++, C, Perl5, and gnu gdbm to allow instantaneous game data compiling and linking. Championed development of rapid turnaround time game development methodology in use on all games at Paradigm. PilotWings64 was developed under direction of Shigeru Miyamoto, with multiple Nintendo EAD employees on staff locally in Dallas to oversee the product's development. Design was performed by Nintendo EAD in Japan, and design documents were

faxed from Japan. Binary ROM images were uploaded via ISDN modem to close the loop on the game development.

**Visualization & Simulation Software design, Texas Instruments, Dallas, TX - January 1992 - August 1994.**

Designed and implemented the visual component of the Arpa Reconfigurable Simulator Initiative (ARSI). Gained experience with IRIX, Performer, GL, Flight Format, Designer's Workbench, 3D Studio, model design, terrain generation, SGI Audio Library, inter-process communication, Compiler Design, AWK, Perl, sed, sh, tcsh.

**Computer Lab Operator, Texas A&M University, College Station, TX.**

Experience with X, UNIX, GNU C Compiler, GNU C Debugger, TeX, TCP/IP, NFS, NIS (YP), and network management.

**Rawks, published 1994 by Silicon Graphics, Mountain View, CA.**

Rawks is a four player game written in GL. It uses custom rendering optimizations to allow 60Hz 1280x1024 real-time multi-player support on any class SGI machine. Rawks uses the AWK programming language and a simple custom language to allow extremely rapid development of new levels. I also created original custom sound effects for this game.

**Advanced Wizard Construction Set, first publishing 1984 Progressive Peripherals & Software, Denver, CO.**

AWCS is a level builder for a game for the Commodore-64 computer. AWCS was picked up for a second publishing, *Ultimate Wizard Construction Set*, in 1986 by Electronic Arts.

**Titles:**

Ultimate Wizard, 1986, Electronic Arts  
PilotWings 64, 1996, Nintendo EAD  
San Francisco Rush/Wavenet coin-op 1998, Atari Games  
San Francisco Rush 2049 coin-op, 1999, Atari Games  
San Francisco Rush TE coin-op, 2001, Atari Games (published as Special Edition in 2004 by Betson)  
Crimson Skies / TsuMo coin-op, 2002, Tsunami Visual Technologies  
MechWarrior 4 / TsuMo coin-op, 2002, Tsunami Visual Technologies  
WildStreets (sportbike stunt game unpublished), 2003, THQ  
Jak and Daxter 3 (Jak3), 2004  
NTRA Breeders' Cup Tournament Edition coin-op, 2005, UltraCade  
UltraPin video pinball, 2006, GlobalVR  
Unpublished Title MMO from Red 5 Studios, unreleased as of 2009, Red 5 Studios  
Vegas 2047 (unpublished video pinball game with gambling elements) 2014, NanoTech Gaming  
CasinoKat (unpublished arcade maze game with gambling elements) 2015, NanoTech Gaming

**Education:** [Texas A&M University](#), College Station, Texas

**Degree:** Bachelors of [Computer Science](#) with [Electrical Engineering](#) minor (December 1992)

**Courses:**

Networks, Graphics, Operating Systems, Compiler Design, Architecture,  
Advanced Architecture, Algorithms, C, AI, Circuits, Microprocessor  
System Design, Computer Interfacing.

GPA: Overall: 3.7 Major: 3.9 Minor: 4.0 (A == 4.00)

**References:** available upon request