Loring Scotty Hoag

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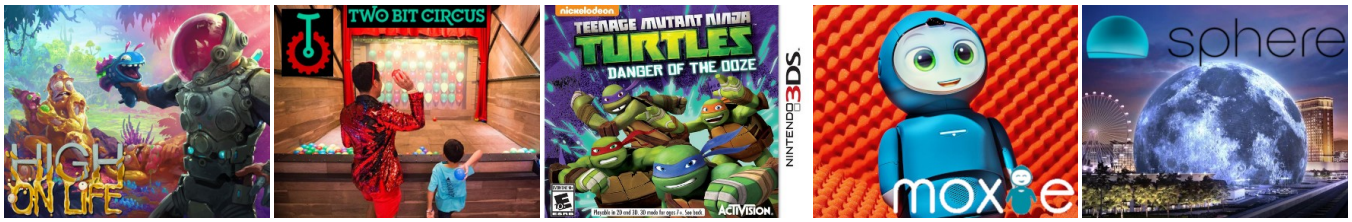

I am an Interactive Software Engineer with over 13 years of experience and more than 20 shipped projects over a broad range of platforms including game consoles, mobile devices, PCs, VR headsets, arcade, motion simulators, escape rooms, interactive live theater shows, and location-based entertainment installations. I'm a generalist programmer with skills at all abstraction levels including building real-time 3D simulations, writing embedded systems firmware, and even getting down to the metal (literally) with a soldering iron. Pictures and videos of my works are available on my portfolio website.

Skills & Specialties

- *Game Engines and IDEs*: Unity, Unreal Engine 5, Visual Studio, Eclipse
- *Languages*: C#, C++, Python, x86/MIPS/Arm Assembly, Java, JavaScript, Lisp/Scheme, Arduino, Verilog
- *Additional Experience*: Game Logic, AR, VR, Oculus, Vive, Meta Quest, Multithreading, Networking, Embedded Systems, Microcontrollers, PLCs, FPGAs, Raspbery Pi, Android Native NDK, GIT, SVN, Perforce, Maya, 3DS Max, Unreal Blueprints, Unity Editor Tools, PHP, MySQL, REDIS, REST, Linux, PC, Game Consoles, Mobile, QLab, Open Frameworks, Chatscript

Professional Experience and Works

Sphere Entertainment, Madison Square Gardens — September 2023 – Present

Senior Software Engineer, Interactive Media

The Sphere, Las Vegas (Interactive Theater Experience - 2024)

- Developing technologies, games, and interactive experiences for The Sphere theaters.

Squanch Games — September 2021 – November 2022

Senior Gameplay Programmer

High on Life (Xbox Gamepass, PC – 2022)

- "*High On Life* is the biggest Game Pass release of 2022, the biggest 3rd party launch in Game Pass history, and the biggest single-player game launch on Game Pass ever." - Statement from Microsoft, via Xbox Wire
- Wrote Unreal Engine 4 C++ engine code, C++ game code, and blueprints for game systems including: Connecting AI pathfinding nodes across dynamically loaded level segments, boss and enemy attack patterns, player weapon logic, dynamically changing collision volume sizes, mission objective systems, and awarding multi-platform achievements.
- Wrote location predictive ballistics calculations for projectile weapon target tracking for "Bullet Hell" fight sequences.
- Worked with designers and other team members to prototype, test, and refine new AI behaviors and features.

Embodied Inc. — November 2020 – August 2021

Software Developer, Interactive Design

Moxie the Robot (Child Development Animatronic Social Robot - 2021)

- Built C++ tools for compiling visual flowcharts into valid Chatscript code for natural language processing.
- Collaborated with designers to use those tools for creating interactive chat experiences for users with the robot AI.

Two Bit Circus Amusement Parks — March 2016 – March 2020

Senior R&D Software Engineer

- Directly lead the simultaneous development of several arcade and high-tech carnival midway games. Kept all projects on schedule so they were complete and operational for the amusement park's grand opening date.
- Acted as lead or senior software engineer on +10 shipped attractions. Built interactive experiences with a mix of Unity C# and F#, Open Frameworks C++, and Python. Wrote Arduino and PLC firmware for custom hardware, and C# scripts for communication between hardware and game elements using Serial, OSC, and Modbus protocols. Optimized networked attractions via multithreading. Set up BASH and Batch scripts for speeding workflow.

- Wrote APIs for partner developers to port their games to TBC's arcade platform, automated testing tools for games to "play themselves" to aid QA in finding and replicating bugs, and manuals for usage and maintenance by park staff.

Sex, Death & Rock! (Interactive Theater Experience - 2020)

- Wrote networked multiplayer game logic for Unity client and Python server, supporting +50 simultaneous players.
- Wrote image processing algorithms in Python for grading player scores in drawing-based minigames.

Last Ball Standing (Midway Game - 2018)

- Wrote Unity C# scripts for player controllers, physics, collisions, gameflow, particles, combat, UI, and more.
- Wrote microcontroller firmware for custom 3-foot diameter trackball controllers using real circus performance balls.

Demolition Zone (Midway Game - 2018)

- Wrote Unity C# scripts for player controllers, physics, powerups, gameflow, enemies, scoring, and procedural level creation system. Built Unity Editor tools for designers to configure the procedural level system.
- Wrote tools to track player input via LIDAR sensor using Open Frameworks C++, and C# OSC for game communication.
- Wrote force feedback system to shake the physical play area with varying intensity in response to game actions.

WayForward Technologies **June 2012 – March 2016**

Lead Gameplay Programmer

- Wrote C++ and C# game logic and engine code for commercial and in-house engines for console, PC, and mobile games.

Adventure Time Puzzle Quest (iOS, Android - 2015)

- Wrote Unity C# scripts for match-3 puzzle mechanics, scaling UI systems to properly display on all iOS and Android screen sizes, context-sensitive help overlays, scripted tutorials, and layered buff/debuff powerup systems.
- Designed strict state logic for other engineers to follow for ordering actions and effects of the turn-based battle system.

Teenage Mutant Ninja Turtles: Danger of the Ooze (Xbox360, PS3, N3DS - 2014)

- Wrote a cross-platform coroutine scripting language in C++ for Xbox and Playstation, with Arm 9 assembly for the 3DS.
- Used my C++ coroutines to write hyper-efficient enemy and boss AI, event systems, menu UI, and map systems.

Altera / Intel **May 2011 – August 2011**

Software Engineering Intern

- Built GUI software testing and demonstration tools with C++ Qt libraries for Altera FPGAs.

Social App Lab @ CITRIS **May 2010 – May 2011**

Technical Director | Full Stack Developer

- Oversaw the development of mobile apps for health research, with design input from UC Berkeley professors.

PokerWalk (Mobile App - 2010)

- Designed and built multiplayer GPS AR mobile game for health research, including estimating calories burned playing.
- Wrote all Android client code, and all PHP + MySQL backend code for server-side game logic and multiplayer lobbies.

University of California, Berkeley: Hybrid Systems Lab **May 2010 – May 2011**

Research Assistant | Full Stack Developer

STARMAC: Capture the Flag (Mobile App - 2010)

- Wrote GPS Android app for with UDP packet system for communicating with autonomous drones.
- Developed multi-threaded contour height map code for plotting data collected in real-time with Android native NDK.

EDUCATION

University of Southern California, Los Angeles
(In Progress) **2025**

- Master of Sciences (MS) in Computer Science, Artificial Intelligence

University of California, Berkeley
2010

- Bachelor of Arts (BA) in Computer Science
- Undergraduate Certificate in New Media.

Educational Courses Taken

- Data Structures (Java)
- Algorithms, Discrete Math, Probability (Runtime Analysis)
- Artificial Intelligence (Python)
- Computer Graphics (C++, OpenGL, GLSL)
- CGI Animation Studies (Maya)
- Computer Architecture (C, MIPS Assembly)
- Parallel Computing (C++, Nvidia CUDA)
- Mechatronics (C, Arm 7 Microcontroller)
- Embedded Systems (C, Atmel Microcontroller)
- Digital Design (FPGA, Verilog)

ACADEMIC & PERSONAL PROJECTS

NATCar Autonomous Race Car Competition (Intercollegiate Team Competition - 2010)

- Worked on control systems, microcontroller firmware, and hardware circuit design for autonomous model race cars.
- Placed 3rd for class competition fastest lap time. Placed 6th for state intercollegiate competition fastest lap time.

Barkeley Ball (Motion Controlled AR Game - 2009)

- Wrote multi-staged graphics pipeline processor and gameplay systems in Verilog for the Xilinx Virtex-V FPGA.
- Interpreted real-time camera stream for tracking physical player movement for game input, and for inserting blue screen augmented reality effects into game visuals.
- Wrote Python tools for compressing in-game art assets and sprite animations.
- Voted 1st place in annual Digital Design project competition.