Contact

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www.twitchythumbs.com

Top Skills

Software Development
C++
3D

Languages

Polish (Limited Working)
Russian (Limited Working)
English (Native)

Jim Buck

Video games. Simulation. Visualization.
San Diego, California, United States

Summary

30 years a software engineer in game development and adjacent industries like autonomous drones/vehicles, I have worked for developer-publishers like Sony PlayStation and Amazon Games, well-funded startups like Zoox and Argo AI, and two self-startup game studios, Twitchy Thumbs Entertainment and DepthQ.

Over the years, I've worked in most areas of game development, primarily in C++: graphics, physics, engine, exporters, tools, audio, and UI. My specialties are visualization and simulation, fostered by a strong math background, plus cross-platform development. I've shipped on most platforms, developed on all modern operating systems, but mostly Windows, console (esp. PlayStation), and OpenGL.

Well-known franchises worked on,
as individual contributor:
• The Grand Tour ("Top Gear" by Amazon, hosted by same guys)
• Twisted Metal
• NFL GameDay
• NBA
• Extreme Games
• Fieldrunners
• Bully (Grand Theft Auto "cousin")
• BIT.TRIP
• Rally Cross
as cross-platform developer:
• Descent
• Quake 3 Arena
as manager of PS3 work:
• Iron Man
• The Nightmare Before Christmas
• Phineas and Ferb
• Need For Speed

Experience

Twitchy Thumbs Entertainment, Inc.

Founder / Lead Developer

September 2005 - Present (19+ years)

San Diego, CA

• Pixelmage Games: PC Hero's Song; world collision, path-finding, debug viz, terrain type, some effects systems

• Choice Provisions: sole dev last 50% PS4/PS3(unreleased)/PSVita THE BIT.TRIP from Win/Mac

• Empty Clip Studios (Gaijin Games): sole dev BIT.TRIP CORE/VOID/FATE/ FLUX port Wii->Steam/Mac App Store/standalone

• Fire Hose Games: sole dev last 50% of PS3->Steam port of Slam Bolt Scrappers

• Subatomic Studios:

- sole dev PSVita Fieldrunners 2
- w/Autodesk: led eng. team on TinkerBox iOS; dev of Win(dev-only)/iOS platform systems, OGRE integration, graphics tools
- sole dev of Fieldrunners on Steam/Mac App Store/Humble Indie Bundle
- Android Fieldrunners / Korean/Chinese versions; localization programming, OpenGL bugs
- DLC features in iPad Fieldrunners
- iPad initial port of Fieldrunners PSP
- localized PSP Minis Fieldrunners
- sole dev of PSP Minis Fieldrunners from iOS

• Four Door Lemon: Clever Kids:

- Pet Store/Creepy Crawlies DS/Wii/PC - tool work
- Pirates/Farmyard Fun DS/Wii/PC - finished last 30%

• Mad Doc Software: Bully: Scholarship Edition PS2->Xbox360 port; RenderWare emulation, animation system, clothing manager

• SCEA: NeoSport Racing League PSP vertical slice, initially Win32-OpenGL/ PSP port of Rally Cross PS1

• Proprietary:

- PSP/iPad Descent engine port
- DepthQ Leathernecks engine port to multi-platform - PSP Quake 3 Arena engine port
- TTElib, shortcuts multi-platform development, w/PSP/PSVita OpenGL implementation

• Non-games:

- National Oilwell Varco: led dev/optimizing a sim
- Mixed In Key: One Idea; OpenGL VFX
- Heavy Water:
    - Axis Game Factory
    - w/Disney&EA: PS3 themes Phineas&Ferb/Nightmare Before Xmas/Iron Man/ Need for Speed: Most Wanted/Diablo III
- Insomniac Games: tool to convert geometry->UVs, OpenGL testing app - SCEA: PS3 tool

• Telltale Games: Win10 Batman: The Telltale Series; fixed multi-touch support • Empty Clip Studios: Chocolatier DS; initial DS version
• Milkman Games: Aqualux Win32 GDI work

Freelance

Professional Musician / Guitar Player

November 2018 - Present (6+ years)

San Diego, CA

In my free time, I am doing music as a professional hobby. I started on guitar in the late 80s, put it down as college, software development career, etc., were taking off. I would re-discover guitar for a year or two over the years, and finally picked it up back in 2018 after a 15+ year hiatus, and haven't put it down since.

Since I took three years of violin in elementary school, and I minored in music in college, which included sight-singing, ear-training, and music theory, I have had a solid base to draw upon in my guitar work. I work out music by ear rather than relying on online materials, which often range from "kinda wrong" to "completely wrong".

I have been in a bunch of bands, which have ranged from 50s-80s rock/R&B to 80s classics or metal to punk rock, the latter in both originals and cover songs.

• Business development in identifying venues/events and putting together proposals for said locales to secure live performance gigs, both paid and unpaid, for bands I am in; in some cases, these were multi-band proposals for a larger event
• Video-editing using Kdenlive
• Sound recording and engineering using Reaper
• As a bonus, in my earlier PlayStation 1 development days, I was tasked with lower-level audio programming; some tech developed at that time helped in my understanding with how some aspects of audio engineering work

Zoox

Staff Software Engineer

February 2022 - March 2024 (2 years 2 months)

San Diego, CA (in-office but remote for a team in Foster City, CA)

• Developer on the Simulation team, using C++ in Visual Studio Code for Linux • Worked with the Planner team on visualizations in a C++/SFML/ImGui-based application used to develop and debug a brand new planner decision-making process, sometimes digging into GLSL code to fix bugs or optimize

• Added visualization features to simulation applications as I would come across and identity obvious missing introspection tools

• Collaborated with the art team on world generation issues and features, some work done within Houdini and Blender

Argo AI

Staff Software Engineer

October 2020 - January 2022 (1 year 4 months)

San Diego, CA (remote for Palo Alto, CA)

Offboard Platform & Visualization team

• C++ development using Visual Studio Code on Linux for an application used to visualize in 3d-rendered graphics the replays and simulations of our autonomous vehicle fleet, impacting multiple internal teams that use the application in their own development, testing, and troubleshooting

• Review pull requests for both my and others' teams making changes to our codebase

• Mentor for high-performance C++ and OpenGL usage when the team was porting to OpenSceneGraph

Amazon (3 years 11 months)

Software Development Engineer, Amazon Prime Air
June 2019 - October 2020 (1 year 5 months)
San Diego, CA (remote for Seattle, WA)

Drones! Robotics! Autonomous driving!

• C++/Python-based development for an application used to visualize simulation of autonomous drones, used for backyard package delivery, impacting multiple internal teams that use the simulation for testing their systems. This was using Visual Studio Professional and Unreal Engine 4, developed on Windows with target Linux used for building/testing and final delivery for the users.
• Integrated ImGui into the Unreal Engine 4-based application we were developing, and converted the Slate-based GUIs over to using ImGui as well as building new GUIs and visualizations via ImGui.

Software Development Engineer, Amazon Game Studios
December 2016 - May 2019 (2 years 6 months)
San Diego, CA (sometimes remote for Seattle, WA)

Development mostly in C++ in Lumberyard, using Visual Studio Professional, with occasional Python scripting needs for the build system.

• Integrated PhysX into Lumberyard, impacting an unannounced San Diego game and Seattle's "Crucible"
• Evaluated a 3rd party physics engine, rFactor, for Seattle's "The Grand Tour Game" team, which was then used based on my recommendation
• Later joined "The Grand Tour Game" team's physics team (https://en.wikipedia.org/wiki/The_Grand_Tour_Game)
• Impacted the Lumberyard documentation team by finding many errors in their public-facing documentation and contributed to their eBus documentation from internal wiki pages authored by me
• Mentored programmers who were new to C++ and writing optimal code for lower-level languages
• Gave an internal "GDC" talk to AGS Seattle on the top 10 things found in code reviews which was later played on a loop in AGS Irvine and posted on an internal company-wide YouTube-like website: https://www.youtube.com/watch?v=3E76ZRP6Qt0
• Developer on internal Lumberyard demo meant to illustrate best practices to internal AGS teams

International Game Developers Association (IGDA)
Member, Board of Directors
December 2006 - July 2007 (8 months)
San Diego, CA

I helped organize our local chapter events and social mixers. I even gave a talk at one event called "Rally Cross Physics": https://youtu.be/pwbwFdWBkU0

Sony Computer Entertainment America
Senior Software Engineer
February 2003 - July 2005 (2 years 6 months)
San Diego, CA

Worked in Sony's first party development studio, developing in C++ in Visual Studio for the PlayStation 2 console and PlayStation Portable (PSP) handheld systems, getting very low-level and optimizing when needed.

• Optimization of PSP graphics work aided "NBA 2006" PSP to run at 60 frames per second.
• Self-authored PSP graphics engine that shipped in the launch title "NBA 2005" PSP as well all releases through 2010. "NBA 2005" PSP sold 175k units as of late summer 2005. The engine was also used in the Sony NFL game before the game was cancelled due to Electronic Arts taking over the NFL license exclusively (https://www.gamespot.com/articles/big-deal-ea-and-nfl-ink-exclusive-licensing-agreement/1100-6114977/).
• Identified and narrowed down the reproduction of a hardware skinning bug that the library team had to make a library change in order to work around.
• One of the first developers, if not THE first developer, in North America to have the PSP development hardware.
• Led the Advanced Technology Group (ATG) for PSP graphics serving the PSP sports titles. Designed and implemented the command-line tools and real-time Win32 (using OpenGL) and PSP rendering engine, including renderers for static, skinned, and octree-culled models. Also, adapted an existing Maya exporter to round out the toolset. Collaborated with the ATG animation lead to make the skinned rendering work correctly with his animation engine.
• PlayStation 2 "NFL GameDay"/"NCAA GameBreaker" 2004: 3d collision detection/resolution, object rigid-body physics, color quantizer utilizing PlayStation 2 multi-media instructions for optimization, 2d/3d debug primitive display, dual-shock controller pressure-sensitivity support, and many others features. Both games sold almost 350k units.

DepthQ, Inc.
Founder/President, Lead Developer
May 2000 - February 2003 (2 years 10 months)
San Diego, CA

• Developed in C++ an unreleased browser-based multiplayer 3d vehicular combat game called "Leathernecks" for Sony Online Entertainment. Primary responsibilities included game design and engine design/implementation, including object behaviors/collision, using Visual Studio 6.0 and the WildTangent COM-based ActiveX control web driver that acted as the renderer. This included figuring out how to play nicely with Internet Explorer, creating a versionable plug-in that the browser would detect needed installation. I also implemented the frontend using basic HTML and JavaScript. Screenshots: http://www.twitchythumbs.com/leathernecks/leathernecks.html
• This was a startup, so I partnered in securing an office, setting up insurance, getting a payroll service, hiring a couple artists.

Sony Interactive Studios America / 989 Studios / Sony Computer Entertainment America
Lead / Senior Software Engineer
March 1996 - May 2000 (4 years 3 months)
San Diego, CA

Worked in Sony's first party development studio, developing in C and assembly language for the PlayStation 1 console system, getting very low-level and optimizing when needed. A lot of this work included a fair bit of Windows 95-based console tool development using C++ on Visual Studio 6.0.

• "Twisted Metal 4" - Led the engineering team, and continued development on the game engine and vehicle physics, including destructible environments, and implemented a lot of new rendering features such as reflection mapping and dynamic colored directional lighting, giving the vehicles a much more dynamic and smooth look than the previous vehicle games. Completed in ten months; 1.2 million units sold.
• "Twisted Metal III" - Developed the game engine and continued work on the 3d vehicle physics, including a dynamic object system (adding the base technology for projectile weapons) and 3d collision system with environments (prior racing games used a 2d heightmap for environment collision). My initial game engine implementation was also used for "3Xtreme". Completed in ten months; 1.4 million units sold.
• "CART World Series" - Continued development on the 3d simulation physics system, including cars that can break apart into pieces with physics simulating those pieces. 200k units sold. Success of the two racing games' vehicle physics led to being handed the "Twisted Metal" franchise.
• "Rally Cross" - Developed a 3d vehicle simulation physics system from scratch, prior to the existence of game/physics engines, and got it performant at 30fps on an under-powered console. 200k units sold. Gave a talk on how I implemented the physics system 10 years later: https://youtu.be/pwbwFdWBkU0

Education

University at Albany, SUNY Master of Science, CompSci

Albany, NY

Masters thesis using OpenGL 1.0, only available on SGI workstations; identified an OpenGL bug, helped the SGI developers troubleshoot the issue.

Thesis was developing an application that modeled the computer science department and optimizing the rendering using top-down 2d culling methods; the application's goal was to gather data for natural language processing for Professor Andrew Haas. The idea was for a human, on one networked end of the application, to tell a policeman in the simulation, controlled by a human, where to go using natural language in order to find a bomb set somewhere in the virtual CS department. This data was later used to have the computer move the robot through NLP. An initial whitepaper of this from Professor Haas can be found in the 1992 proceedings of Principle of Knowledge Representation and Reasoning here: https://books.google.com/books?id=Eg4ZAQAAIAAJ&pg=PA93#v=onepage&q&f=false

University at Albany, SUNY Bachelor of Arts, Math

Albany, NY

Minored in computer science, with specialization in computer graphics, and music, which included music theory, sight-singing, ear-training, and music history. My previous minor was Russian, leading to 7.5 years total in learning the language.

Math degree has been super helpful in my game development career since much of 3d math is based on linear algebra, coursework I took for some time without realizing the future power.