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I'm a C, C++, Swift, Rust, Objective-C, C#, Java, Python, OpenGL/GLSL, HTML/CSS/Javascript and anything else programmer focusing on user experience, graphics, performance, mobile apps and AR/VR.

2020-present: Stream, LLC

Graphics Engineer

At Stream I work on optimizing and extending the AR experience of Stream's AR tools, specifically focusing on custom metal rendering pipelines, and interactive guided experiences for users.

At Stream I've been responsible for:

- Prototyping several different strategies to optimize scanning a user's space both in terms of speed, quality, and enjoyment
- Implementing graphics pipelines for the above (mostly via ARKit, but a fair amount of custom metal pipeline and shader code)
- Optimizing the graphics pipeline for both performance and quality of appearance
- Testing these prototyped experiences with users, and developing a final polished experience which is currently shipping in the Lowe's app
- This work won an AWE "Auggie" for [Best Consumer App](#). See also the [accompanying promo video](#).

2019-2020: Bluehawk, LLC

Software Engineer, contracted to Google

In my work for Google I was responsible for building a tool for identifying the nuances and corner cases of Android performance, to aid in making Android a better platform for games. In this role I've been responsible for designing and building the testing framework, data reporting/analysis, and a suite of tests which exercise OpenGL, multi-threading strategies, and other performance-oriented tests relevant to game engine designers.

2016-2019: Vulcan, Inc

Senior Software Engineer, Rapid Prototyping

At Vulcan I was responsible for prototyping Paul Allen's vision with a goal towards productization and IP generation.

My work at Vulcan focused on AR/VR experiences, but dabbled in other directions at times:

- Augmented reality in-stadium fan experience for the Seahawks for AR glasses and phones built in Python/numpy, Unity and native C++
- Hololens-based security glasses experience (ML backend) to aid personnel in recognizing persons of interest on a property, built in C#, C++ and Unity
- Developer simulator for Vulcan's Holodome, built in C# for Unity
- Input calibration for Vulcan's Holodome installations, built in C# for Unity
- Multi-camera synthesis for simulating "body presence" in virtual reality with a network layer built in C++, and user experience in C# for Unity
- Android-based data collection/distribution system for health workers in developing nations to monitor trends to detect possible outbreaks
- Indoor location tracking for venues to improve customer experience while preserving user privacy built in Swift on iOS

1999-2016: APCO Worldwide**Art Director, Front-End Developer**

At APCO Worldwide I was responsible for working with clients to prototype, test, design and build websites, web applications, dynamic data visualizations, online games, and native mobile applications.

- Fully responsive web application front ends written in HTML, SASS/CSS, and Javascript
- Native mobile applications for iOS and Android, written in Objective-C, Swift, and Java
- Designed user experiences in Sketch, Photoshop, and Illustrator
- Prototyped user experiences using web technologies (HTML, SASS/CSS, Javascript)

2013-2015: ConsultPro (a failed startup)**UX Designer, UI Designer, Full-Stack Developer**

For ConsultPro I was responsible for UX design, UX testing, UI design, iOS development and backend network sync API design and implementation.

1997-1999: Darden School of Business, Charlottesville VA**Graphic Designer & Programmer**

At Darden I designed & built educational software in Macromedia Flash and Director.

Personal Work:

In my personal work I've developed robotics simulations (simple behavioral-based locomotion control systems with 2D & 3D visualizations in OpenGL) in C++ with hardware abstraction to enable the models to talk to real hardware. I've written 2D and 3D games and game engines in C++/OpenGL. I've also built microservice back ends for web applications in Node and Spark Java (a Node-like Java framework built on top of Jetty).

Education:

Art, University of Virginia, class of 1999

A lifetime of reading, building, experimenting and trying to make interesting things