Morgan K Davis

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SUMMARY

I've built and sold independent software products, developed software for biometric imaging systems, developed new technologies and interactive systems in a multidisciplinary R&D group, led engineering teams, implemented firmware features, and independently created a C++20 real-time 3D visualization and simulation SDK.

I have broad technical knowledge, good product sense, and a track record of connecting ideas across disciplines to solve problems. I'm comfortable with loosely defined requirements and working with a high degree of autonomy.

EXPERIENCE

Creator and Developer, Avara3D (avara3d.net) | 2022 - Present

- Independently designed and implemented a C++20 real-time 3D visualization and simulation SDK with OpenGL rendering, Bullet rigid-body physics, and fixed-step simulation.
- Implemented a staged rendering pipeline incorporating scene gathering, draw-packet generation, and backend execution.
- Built runtime performance instrumentation and diagnostic tooling, including CPU/GPU timing, memory-usage statistics, and debug visualization.
- Created a CMake-based build system and automated CI pipeline for Linux, macOS, Windows, and WebAssembly/Emscripten.

Senior Software Engineer (Part-Time), Turtle Beach Inc. | Feb 2024 - Jun 2026

- Owned cross-platform firmware updates/OTA: worked with the firmware team and SDK vendor, developed client integration modules, and validated the end-to-end update process.
- Prototyped browser-to-headset communication using CoAP over USB; implemented USB HID interrupt-IN support in C firmware and built a WebHID client with TypeScript and Vue.js.
- Developed and maintained BLE firmware functionality. Implemented headset/transmitter matching across firmware and the mobile app, using a shared identifier in BLE advertisements to select the correct transmitter for firmware updates.
- Prototyped a Flutter/Dart companion app for flight and racing simulation products with a task graph, logging, BLE discovery and connection, and configuration exchange.
- Developed features for existing desktop (C++/C#) and mobile (.NET MAUI/C#) applications.

Career Break | Sept 2022 - Feb 2024

Planned career break for personal interests and independent technical work, including Avara3D.

Principal Software Engineer, Turtle Beach Inc. | Feb 2020 - Sept 2022

- Led a cross-functional team of four software engineers, two QA specialists, and one designer to deliver a new generation of mobile and desktop companion applications, substantially improving quality and raising mobile-app ratings from approximately 1.5 to 4.8 stars.
- Designed the shared Xamarin/C# architecture for desktop and mobile applications, supporting multiple device protocols over USB HID, Bluetooth Classic, and BLE; remained hands-on with implementation, deployment, code review, and mentoring.
- Partnered with product management and key stakeholders to define requirements, deliverables, and release schedules.

Consulting Software Engineer, Turtle Beach Inc. | Jun 2018 - Feb 2020

- Oversaw and contributed directly to companion app development across iOS, Android, Windows, and macOS, delivering multiple on-time product releases.

Senior Software Engineer (from 2016), R&D/PLT Labs, Plantronics Inc. | Oct 2012 - Jun 2018

- Led hands-on software development for Innovation & New Ventures, a multidisciplinary R&D group; contributed to feasibility studies, company strategy, and early product iterations.
- Developed Objective-C and Java sensor SDKs for prototype wearables; built 3D head-tracking visualizations and a head-controlled telepresence demo using WebRTC.
- Developed prototype software for Soundscape, including a Python server, iPad visualization and controls, and video-wall applications; the sound-masking system was subsequently brought to production by a dedicated team.
- Developed C++ software on Linux/Raspberry Pi for a location-aware workspace prototype, integrating video conversion and storage for LED-matrix playback, audio, and WebSocket control; built supporting Python proximity and positioning services and an iPhone companion app.
- Prototyped FIDO authentication over BLE in Swift and open-sourced a reference SDK, example applications, and documentation.
- Adapted an in-house device communications protocol from Bluetooth Classic to BLE for production use.
- Supported strategic partner integrations, presented prototypes to executives and at industry events, and helped hackathon participants build with our hardware and SDKs.

Software Engineer, Identity Solutions, AOptix Technologies Inc. | Jul 2011 - Oct 2012

- Ported biometric segmentation, templating, and matching algorithms from C++/Linux to iOS for an iPhone-based hardware accessory integrating an IR iris camera and fingerprint sensor.
- Reduced iris-image segmentation time from 35 seconds to 3.5 seconds through optimization work including handwritten ARM NEON assembly.
- Defined and implemented the communications protocol between the iPhone and FPGA-based accessory. Built a UDP device simulator to enable software development before hardware and firmware were available, and collaborated with hardware and firmware engineers on integration.
- Implemented field-of-view and capture-volume mapping between the iPhone and IR cameras from optical engineering specifications, integrating live face and eye localization with OpenCV and Core Image to drive IR camera ROI capture.
- Developed the product's native iOS application and refactored it around a modular SDK provided to customers for integration.

Founder, MKD Software LLC | Jun 2001 - Jul 2011

- Built and sold independent Mac software products using Objective-C/Cocoa and C/Carbon.
- Owned the full product lifecycle, from software engineering and interface design to graphics, website development, marketing, licensing, and sales/distribution infrastructure.
- Notable releases include Socks (shareware; 250,000 downloads, 10,000+ registered users), iMote (freeware; 30,000+ downloads), and Pinki (freeware; 25,000+ downloads).

EDUCATION

B.S. Computer Science, 2011 – University of California, Santa Cruz