

Morgan K Davis

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SUMMARY

Hands-on software engineer with experience in performance optimization, exploratory prototyping, and commercial software delivery. Built and sold independent products, worked on new technologies and interactive systems in a multidisciplinary innovation group, and led engineering teams while remaining directly involved in implementation. Current work centers on Avara3D, an independent C++20 real-time 3D rendering and simulation SDK.

INDEPENDENT ENGINEERING PROJECT

Avara3D – Creator and Developer | avara3d.net | Ongoing

- 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 separating scene gathering, draw-packet generation, and backend execution.
- Integrated Bullet rigid-body simulation supporting static, dynamic, and kinematic bodies with primitive, concave, convex, and compound collision geometry.
- Implemented fixed-step simulation decoupling host updates, simulation, and rendering.
- Built runtime performance instrumentation and diagnostic tooling, including CPU/GPU timing, memory-usage statistics, and debug visualization.
- Created a CMake-based cross-platform build system and automated CI pipeline for Linux, macOS, Windows, and WebAssembly/Emscripten.

PROFESSIONAL EXPERIENCE

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

- Contributed feature and maintenance work to existing mobile .NET MAUI/C# and desktop C++/C# applications.
- Drove cross-platform firmware-update integration, developing integration modules, validating the end-to-end process, and working with the firmware SDK vendor to resolve issues.
- Maintained and improved the existing BLE firmware implementation.
- Built the initial product implementation of a Flutter/Dart companion application, including task-graph execution, BLE discovery and connection, and settings exchange with flight-simulation products.

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

- Demonstrated a unified cross-platform Xamarin architecture to replace disparate legacy codebases, then established it as the production C#/Xamarin platform for iOS, Android, and Windows, delivering multiple milestone releases that substantially improved the quality and consistency of the company's companion software.
- Led a seven-person cross-functional team comprising four software engineers, two QA, and one designer; owned software architecture and remained hands-on in implementation, 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, Innovation/PLT Labs, Plantronics Inc. | Oct 2016 - Jun 2018

Software Engineer, Innovation/PLT Labs, Plantronics Inc. | Oct 2012 - Oct 2016

- Led hands-on software development for Innovation & New Ventures, a multidisciplinary group exploring new ideas and technologies; contributed to feasibility studies, company strategy, and product-roadmap development.
- Developed exploratory prototypes, pilot-program software, and interactive demonstrations spanning sensor-driven interaction, real-time 3D visualization, audio/video, and location-aware systems.
- Created SDKs, reference implementations, example applications, and documentation supporting exploratory technologies and strategic partner integrations.
- Presented technical demonstrations to executives and at trade shows; introduced prototype technologies at sponsored hackathons and helped participants incorporate them into their projects.
- Work spanned a range of languages, platforms, and technologies, including Objective-C, Swift, Java, and C++; iOS, macOS, Android, tvOS, Linux, and Raspberry Pi; and Bluetooth Classic, BLE, WebRTC, WebSockets, and FIDO 2FA.

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

- Ported core biometric software—including segmentation, templating, and matching algorithms—from the existing C++/Linux platform to a new iPhone 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.
- 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.
- Defined and implemented the communications protocol between the iPhone and the FPGA-based accessory, worked with hardware and firmware engineers on integration, and built a simulator to enable software development before hardware and firmware were ready.
- 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 beginning at age 16 using Objective-C/Cocoa and C/Carbon.
- Owned product design, marketing, and distribution, including website development and graphics, licensing/serial-number systems, and sales/customer infrastructure.
- Created 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