

Morgan K Davis

C++ • Systems • Real-Time 3D

Santa Cruz, CA

mkd@mkd.net | (831) 419-8651

SUMMARY

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

INDEPENDENT ENGINEERING PROJECT

Avara3D – Creator and Developer | avara3d.net | **Ongoing**

- Designed and implemented a real-time 3D visualization and simulation engine with a scene-oriented C++20 API, integrating OpenGL/GLSL rendering and Bullet rigid-body physics.
- Implemented fixed-step simulation scheduling with bounded catch-up, pause, and single-step control, separating simulation timing from host updates and rendering.
- Designed a staged rendering pipeline separating scene gathering, draw-packet generation, and backend execution; implemented runtime CPU/GPU timing and debug visualization.
- Developed a CMake-based build system and automated CI pipeline for Linux, macOS, Windows, and WebAssembly/Emscripten.

PROFESSIONAL EXPERIENCE

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

- Contributed across mobile (C#/NET MAUI), desktop (C++/C#), and firmware (C) teams; owned audio-product firmware updating and BLE implementation in firmware.
- Built a working Flutter/Dart companion-app prototype with 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**

- Established a unified C#/Xamarin codebase for iOS, Android, and Windows, delivering multiple milestone releases that substantially improved the quality and polish of the company's software.
- Led a team of six engineers while remaining hands-on in architecture, implementation, code review, and mentoring.
- Worked closely with engineering, product management, and key stakeholders to define requirements, deliverables, and release schedules.

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

- Led companion app development across in-house and offshore teams.
- Developed and maintained existing iOS, Android, Windows, and macOS applications, 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 real-time 3D visualization, sensor-driven interaction, 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.

Selected work:

- 3D head-orientation displays, retail head-tracking heatmaps, and head-controlled telepresence demonstrations.
- C++/Linux LED-matrix video playback on Raspberry Pi, including a custom video-preprocessing pipeline and status overlays.
- Sound-masking system software: Python server distributing speech-detection data to iPad visualization/configuration and Apple TV video-wall applications.
- Open-source FIDO 2FA over BLE reference SDK, example applications, and documentation.
- Adapted the company's proprietary protocol from Bluetooth Classic to BLE, later used in production.

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

- Reduced iris-image segmentation time from 35 seconds to 3.5 seconds through optimization work including hand-written ARM NEON assembly.
- Ported biometric segmentation, templating, and matching algorithms from C++/Linux to iOS; prototyped live face/eye tracking with OpenCV and optimized its implementation using CoreImage.
- Built a hardware accessory simulator to enable application development before hardware and firmware were ready; created manufacturing configuration and calibration tools.
- Developed the native iOS application and refactored it onto a modular SDK provided to customers for integration.

Founder, MKD Software LLC | Jun 2001 - Jul 2011

- Designed, developed, marketed, and sold independent Mac software products, beginning at age 16, using Objective-C/Cocoa and C/Carbon.
- Created Socks, a shareware application with 250,000 downloads and more than 10,000 registered users.
- Released freeware titles including iMote, with more than 30,000 downloads, and Pinki, with more than 25,000 downloads.

EDUCATION

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