

Kevin Kachikian
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Project videos, clients and more:
www.bard-designs.com and www.themuze.biz (password: **community**)

Seeking: A dynamic reasonably fast paced creative environment designing custom hardware, software and mechanical designs on never-been-done-before startup projects that help better people's lives in some way where unique creative solutions are encouraged.

Hard Capabilities: Embedded systems, firmware (RTOS & bare metal), hardware design, iOS apps, MacOS applications, Windows Forms, C#/.Net, OOP & procedural programming, assembly languages, Digital Signal Processing, 2D image processing, PCB layout, UI design, OpenCV, OpenGL, CAD, server side content delivery & payment processing, prototype manufacturing, book editing, basic organic chemistry, videography & photography, bare metal server & SQL, Bluetooth (LE & BR/EDR) integration, sound effects, voice overs, trailer editing.

Soft Capabilities: Ground up project design and entire integrated hardware, software and firmware implementations, project management, excellent organizational skills (code implementation and project management), excellent communications, dynamic, high attention to quality and detail, high creativity and unique solutions, multi disciplinary systems integration, part sourcing, marketing, PR, customer service, high integrity, *always* learning.

Patents: Speech Synthesis: 5029213, 4805220, 5140639 [not under my name]; Copy Protection: 4849836; Electronic Gas Mask: 20230405257, 11738163, 20210154426; Performance Musical Instrument: D231510; Virus Shield: 62/969587, 62/984970; Dually: 63/267,099; Dozens of provisional patents.

Background Highlights: Director of R&D at a startup. Over 40 years of software, hardware and mechanical experience (began contracting at age 16). One of the first ever Mac developers. Built robot at 13. Several patents by 22. Self taught and very self motivated. Wide variety of experiences in project management, Windows (C#, .NET, Forms), iOS / tvOS / MacOS (Xcode / Swift / Objective C / Cocoa) software, C, PHP, MySql, various assembly languages, firmware development, UI design, 3D CAD, 3D printing, CNC, digital audio / DSP / speech synthesis / physical modeling synthesis, 2D & 3D image processing, digital and analog hardware design, PC board layout, mechanical design, 3D laser optics, sound effects / sound design, photorealistic 3D, video editing and production, 2D imaging.

First principles thinker. Excellent at conceiving of new projects and seeing them all the way through to completion with high attention to quality and detail. Love applying broad experience to projects. Love learning and working individually and with talented folks.

Hardware Tools: Spectrum analyzers, oscilloscopes, DVMs, signal generators, logic analyzer, power supplies, microscope, fine soldering, breadboarding, prototyping, bring-up.

Software Tools: Visual Studio, XCode, MPLab, KiCad, Keil/ARM µVision, Atmel/Microchip Studio, Segger Studio, Eclipse, MATLAB, SolidWorks CAD & Electrical, Fusion360, Photoshop, Final Cut Pro, RDWorks, Sigma Studio, nRFgoStudio, CrossCore Embedded Studio, CircuitStudio, Code Composer Studio, TI Codec Control, XMOS Studio, Raspberry PI, Arduino, Amadeus Pro, Github, Atlassian Jira & BitBucket, Crittercism/Fabric, LabView.

Miscellaneous: Creative arts, Wrote feature film screenplay, Leather work, Cofounder of Spiritual Cinema Group, Assistant at the 2001 Disclosure Project at the National Press Club in Washington DC, Drumming, Professional baking, Professional jewelry photography, CERT Member, KK6OEA, Sailing, Drawing, Fitness, Nature lover, Hiking.



Principal Projects & Product Highlights

BioRad Laboratories: (bio-rad.com) Senior Software & Firmware engineer on various projects. Hired to redesign the GenePulser XCell firmware. Retrofitted modern code into older MK22FX/FN microcontrollers. USB communications via FTDI Vinculum II for the TC20 Cell Counter & T100 Thermal Cycler. SMT PCB rework. Developed a 2D image processing system for testing and calibrating new industry leading protein imaging devices.

The Dually Smart Charger: Designed power and low voltage electronics, firmware, PCB, user interface, and operation for a new kind of EV smart charger for the home. Based on the Atmel/Microchip ATSAMC20. Provisional patent.

TheMUZE: (themuze.biz) Conceived and built prototypes for a line of new kinds of interactive musical instruments with the idea of bringing community together locally or remotely. Based around Analog Devices SC589 SHARC+ triple core processor and ESP32 BTLE module. Wrote an iOS control app. 3D CAD, CNC'd and 3D printed the enclosure from high quality Sapele exotic wood. Issued design patent D231510 for one of three form factors. Provisional patent 63/202,705 applied.

De Nova Technology startup: (denovatechnology.com) Director of R&D, design of electronics, software, firmware, mechanical and project management for various technical and non-technical projects. Managed 2-4 individuals. Designed ViruShield prototype. Designed BTLE communications puck for masks. Designed Wine Tyme alcohol vapor detector. Designed hearing assist stick. Designed mask cooling system. Three patents.

Topic Genie: (iOS App Store): Designer, engineer and project manager for Topic Genie an iOS app for students with almost 100K topics to choose from. TG assists students in writing research papers. Wrote over 4000 lines of finely crafted Swift code, data ingestion and encryption tool, IAP, UI. Pretty proud of the way Swift helps write elegant code. Managed entire project including content development, website designer, graphic artist, and myself.

Ray Wenderlich: (raywenderlich.com/store/3d-ios-games-by-tutorials, iOS App Store): Book editor editing 400 page 3D iOS Games by Tutorials book for Ray Wenderlich and his popular team of tutorial app developers.

Adafruit Bluefruit Buddy: (adafruit.com/search?q=bluefruit, github repo): Sole OS X engineer on macOS application written in Swift to control and configure Adafruit's Bluefruit line of Bluetooth LE interface hardware.

Interactive Fairy Tales (iOS App Store): Fun and creative iOS and tvOS limerick/game/coloring book/treasure hunt application for children written in Swift (12,000+ lines) and using Sprite Kit. Designed all animations, sound effects, game play, activities, voice overs, operation, unique localization, and did pretty much everything excepting the graphics and website. Managed a team of 7. Used Asana for project management. Wrote short 30 second score and edited two amazing trailer videos.

ServicePal (servicepal.com, iOS App Store): Principal iOS engineer. iOS consulting since February 2013 to present on a 100,000+ line Objective C SaaS product. JIRA issue tracking and resolution & Crittercism/Fabric crash tracking. Full design and integration of several subsystems such as Credit Card payment processing system using PayPros and MagTek card swiper. Design & implementation of asset tracking and contract management iOS client side. Entire UI redesign. Significant code rewrites to modernize project.

DaVinci's Sky: iOS augmented reality project conceived of a long time ago and made vastly simpler using Apple's CloudKit and Swift programming language. 8000+ lines coded in Swift thus far.

My Living Desktop (OS X App Store): Sole OS X engineer and project manager. Popular 5 star video desktop and screen saver with 100,000 users bringing in over \$750K over its lifetime. Conceived and designed software and tools, shot and edited hundreds of video scenes and produced sound effects, developed automated server side PayPal payment processing integration, automated registration system, content delivery system for Scene Store, several updates and upgrades over the years, customer support, emailing campaigns, marketing. Featured download on Apple's downloads website. Over 1000 customers positive accolade emails.

Shizen (iOS App Store): iOS engineer. Developed in 2013 to present as iOS version of My Living Desktop. 5 titles available: Oceanscapes, Fallsclapes, Flowerscapes, Fujiscapes, and Earthscapes (public domain ISS footage).

GeoFormer: iOS engineer. Gentle action game centered around geometric shapes and interlocking parts with music. Game engine design using SpriteKit for graphics and physics.

Home Based 3D Laser Light Show: Engineer. Design from scratch using Microchip micro-controller, interface electronics, galvo scanners, color RGB lasers, polarization optics (PBS cube & fresnel rhomb for circular polarization) for 3D depth perception, servos for beam steering, visual effects with glass, diffraction gratings, fog and other optical 'filters'.

Bluetooth LE iOS RGB Lighting Project: Principal iOS and firmware engineer. Hardware, software and firmware development in 2013. Socketed high power RGB LEDs as controlled by an iOS device. Complete hardware design, firmware design, BTLE communications and protocol, thermal management, iOS interface with programmable effects such as acoustic driven effects, proximity effects, color and intensity choice, built-in timer controls.

Forensic Audio Sleuth: Sole OS 6 - OS 9 engineer from 1995 to 2004 consulting for Forensic Audio Labs. Implemented a full custom tool suite of forensic audio tools used in legal cases with the FBI, LAPD, Michael Jackson, the Menedez Brothers, Ozzy Osborne and many high profile media companies and Hollywood celebrities. Designed all kinds of audio analysis tools such as a time correlated spectrograph, spectral shaping and subtraction filters to enhance garbled audio, spectral painting tools, FFT waterfall plots, and a host of other capabilities to aid in the cleaning up of hard to understand audio. Developed in C, 68000 assembly, and 56000 assembly.

Forensic Image Sleuth: Sole OS 6 - OS 9 engineer from 1995 to 2004 consulting for Forensic Audio Labs. An image analysis tool used to make precise, spatially correlated measurements of highly magnified ferrofluid over audio tape images to prove a connection between a particular tape recorder and a particular tape. Also used in many high profile legal cases.

Laser Light Harp: Conceived and built a laser light harp for 4-time Grammy nominated David Arkenstone for his live concerts. Designed mechanical, optics, electronics and woodworking.

Magnetic Media Raster Scanner: A 3 axis, ultra high resolution (2 micron) 3D raster scanner to visually image the magnetic field lines on audio tapes. Conceived and started implementing the design in 2001 and rendered 3D concept models to show its operation. Started to build when the project was cancelled.

Disney Imagineering Indiana Jones Ride Prototype: Consulted for Walt Disney Imagineering on a prototype motion base for the Indiana Jones ride and demoed to Michael Eisner. Designed ride control software and motion recording using LabView.

Davidson and Associates Children's Educational Software: Lead engineer implementing several Kids Educational software titles in Pascal for an early version of Mac

OS most notably the award winning KidWorks 2 and Spell It Plus. Managed 3 other engineers.

SmoothTalker Speech Synthesis: (archive.org/details/mac_SmoothTalker_2.1) Began contracting at 18. Three patents issued 5029213, 4805220, 5140639 [not in my name]. This technology was eventually sold to Apple and became the foundation of Apples speech synthesis technologies. 68000 assembly backend and Pascal front end working with another engineer.

LA Times Pollutant Plotter: Wrote a pollutant plotter program which downloaded the current air pollutants from NOAA each evening and plotted them in the weather section of the paper the next morning.

Disk Copy Protection: Patent issued 4849836. Designed and developed an idea to write 'weak bits' to a disk media in order to copy protect it. Designed hardware and control software as well as the read back software embedded in other software to detect copying.

Stanford University CCRMA Waveguide Music Synthesis for Brass Instruments: Mac prototype demo of brass instruments using an existing physical modeling concept used in Yamaha music instruments. Worked with Julius O. Smith the founder of physical modeling Synthesis and Perry Cook, music professor.

Phillips Interactive Media authoring tool: Wrote a Mac based authoring tool which did spectral analysis using FFT's in order to automatically drive graphical events based on music input.

Best Technical Successes:

- *1st place:* Real time native speech synthesis on 1MHz 6502 processor using only built in speaker, timed code PWM modulation, no interrupts, and no hardware assist of any kind on a completely stock 1980's Apple 2. Apple engineering was so impressed they asked me to remove the cover to prove there was no other hardware present. Accomplished this at 20 y/o.
- *2nd place:* My Living Desktop - delivering over \$750K in under 8 years completely single handedly from concept to technology to marketing to content to server side integrated purchasing to PR and customer support.

Book Editing:

- Edited 600 page [Disclosure Project](http://www.amazon.com/Disclosure-Military-Government-Witnesses-Greatest/dp/0967323819/) book: www.amazon.com/Disclosure-Military-Government-Witnesses-Greatest/dp/0967323819/
- Edited 400 page [3D iOS Games by Tutorials](#)

Miscellaneous:

- Showcased in May 2012 MacTech Magazine
- Co-founded a Spiritual Cinema group in 2004 with 800 members under the supervision of writer/producer Stephen Simon (What Dreams May Come, Somewhere in Time, All the Right Moves, Bill and Ted's Excellent Adventure).
- A decidedly Spiritual understanding of life. Love the outdoors and nature. Sailing. Hiking.

