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## **EXPERTISE:**

Software architecture and design for consumer products including professional video, audio, medical equipment and robotics. OOD, Python, C++, C, Firmware, RTOS, Embedded systems, Git, Large codebase management, Geographically distributed teams, Hardware design. Strong oral and written communication skills.

## **BUSINESS EXPERIENCE:**

*Jan. 2015 – Apr. 2016*      **Blackmagic Design, Nevada City, CA**      **Lead Software Engineer**

- Development of new products and features for the HyperDeck and Video Assist product line
  - Released new product: [HyperDeck 12G](#)
    - 4Kp60 record and playback
    - ProRes certification
  - HyperDeck 4.4.1 software release with DNxHR (4K) capability
  - Released [VideoAssist 4K](#) at NAB 2016
    - Battery driver
    - SD card UHS2 driver
    - Redesigned dual Zynq memory map to maximize video buffers to handle SD card latency
  - Technologies and tools
    - C++, Python
    - SDI, HDMI
    - V210, ProRes, DNxHD
    - Real-time video and audio storage, SSDs, SD cards, QuickTime file format
    - Adobe Premiere for sophisticated test clip generation
    - Xilinx SDK, XMD debugging, Microblaze and Zynq (ARM) development
    - All development was on a Mac: xcode for simulations and embedded builds

*Oct. 2009 – Jan. 2015*      **Intel, Folsom, CA**      **Senior Media Software Engineer**

- Graphics driver development for the content protection team
  - Delivering innovative DRM solutions on state of the art Intel platforms across multiple operating systems
  - Android and Windows architecture
  - Worked with AES encryption/decryption, graphics surfaces and image formats
  - Received Division Recognition Award for my contribution to Intel's [IPT](#) program
  - Creating portable futureproof designs and implementations with multiple constraints.
  - Worked closely with HW group to bring up DRM technology on latest Intel platforms
- Developed innovative code coverage analyzer for ARM firmware
  - ARM Architecture
  - Green Hills development tools
  - Registered patent and presented paper at Intel's software developer's conference
- Managed Green Hills relationship; Arranged training classes for developers

*Sept. 2004 – Apr. 2009*      **2Wire, Nevada City, CA**      **Senior Software Engineer**

- Responsible for the AT&T Homezone set top box hardware DVT
  - Involved in all aspects (software and hardware) of an EchoStar set-top box
  - Wrote software for Video and Audio interfaces (HDMI, component, composite, SPDIF and Stereo)
  - Created embedded Linux test executive. Optimized kernel and root file system to less than 3.5 MB
- Transferred to residential gateway ASIC verification group after Homezone project was completed
  - Created the process, standards and software development environment (SDE) for post silicon verification of new SoCs. The SDE was written in Python and C
  - Wrote JTAG tools API with SWIG Python extensions
  - Created an innovative cross compilation toolchain using Python and SCons
  - Taught a beginning Python class for the hardware engineers

**July 2003 – July 2004 Evolution Robotics, Pasadena, CA**

**Senior Software Engineer**

- Defined the real-time optimization strategy for embedding the Evolution Robotic Software Platform on low cost embedded Linux targets
  - Profiled robotic applications to understand the tradeoffs between hardware cost and software performance
  - Designed architecture for a CPU-DSP system to accelerate components of the robot's vision object recognition algorithm. Visual Simultaneous Localization and Mapping (VSLAM)
  - Wrote software interfaces between the system components in C++

**Dec. 2001 - Apr. 2003 NAI Tech Products, Auburn, CA**

**Project Lead**

- Project lead for a new medical DVD recorder product. The Medical Digital Recorder (MDR) is a DICOM compatible personal DVD archive
  - Researched DVD video, authoring and recording
  - Wrote product specification, designed object oriented architecture
  - Designed an IPC scheme that allowed for reusable software components
  - All software was written in C++ using object-oriented methodology with the STL
  - Developed an Embedded Windows XP (XPe) operating system for the product
  - The product made a successful debut at RSNA in 2002

**June 2001 - Oct. 2001 Grass Valley Group, Grass Valley, CA**

**Senior Software Engineer**

- Attended Rational Rose Real-time training to learn UML
  - Used Rational Rose Real-Time to implement a CLI in C++ for product power up

**June 1998 - April 2001 3Com – Advanced Technology Group, Grass Valley, CA**

**Senior Software Engineer**

- Optimized and added features to a new analog modem supervisor. Optimized the data path for real-time voice
- Evaluated technology for Internet audio appliances
- Developed Linux kernel module framework for a WAN device driver using object-oriented techniques

**June 1995 - May 1998 Cardinal Technologies (Redwing Corp.), Lancaster, PA**

**Senior Software Engineer**

- Started Cardinal's Advanced Technology Group with other members of Turtle Beach
  - Created documentation standards, SCM and tools. Responsible for DSP BSP
  - The silicon, compiler/linker and internally developed debugger were all new and presented a very challenging development task

**May 1994 - June 1995 Turtle Beach Systems, York, PA**

**Senior Software Engineer**

- Designed software for PCMCIA Audio cards (Audio Advantage and Daytona).
  - Wrote low-level interfaces for audio CODEC and MIDI routines in 68K assembler
  - Created low level PC API for cards for use with Windows driver and software based wavetable synthesizer

**Sept. 1992 - April 1994 Studer Editech, Menlo Park, CA**

**Senior Firmware Engineer**

- Software designer for Dyaxis II Digital Audio Workstation
  - Wrote embedded software for dynamic automation of both the software and hardware mixer interfaces

**Nov. 1986 - Sept. 1992 StrataCom, San Jose, CA**

**Member of the Technical Staff**

- Hardware design for large packet nodes (IPX)
- Firmware designer for T1/E1 packet trunk interface
  - Implemented voice and data packet queuing architecture
  - Wrote firmware for multiprocessor architecture consisting of 4 DSP56001s and one 68008
  - All DSP firmware was written in assembly language
- StrataCom went public in 1992 and was acquired by Cisco in 1996

**PERSONAL PROJECTS:**

- [Google AI challenge](#): Wrote AI software in Python. Ranked 1428 out of 8000
- [Music production](#)
- [GitHub](#)
- [Media](#)

**EDUCATION:** BSEE, **California Polytechnic State University**, San Luis Obispo