

Craig Mautner

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SKILLS SUMMARY

Software engineer with 34 years of experience with embedded hardware and software design. Programming at all levels from kernel internals and device drivers to middleware and applications. Applications with client and server side software.

Expertise with assembly, C, C++, and Java, 32-, 16- and 8-bit processor architectures (ARM, PowerPC, x86, 8052, 6802, PIC) as well as DSPs and SOCs. Experience with JavaScript, Python, PERL, Tcl/Tk, LISP, Fortran. Familiar with multiple operating systems and environments (Android, linux, Arduino, Windows, VxWorks, pSOS, tru2way) including internals.

Skilled in the use of development tools including: IntelliJ, git, eclipse, gcc, gdb, ICE, logic analyzers, oscilloscopes, spectrum analyzers, multiple compilers, linkers, assemblers, and debuggers.

Recent projects include Android core framework and applications (Google, eBook Technologies), MPEG video encryption (Secure TV, Verimatrix), MPEG-2 transport, OCAP/tru2way (Rovi), Arduino hardware and software (personal project), network protocols (TCP/IP, etc.), Digital Video Recorders, USB.

EDUCATION

- Master of Science - Computer Science and Engineering, UC San Diego, 1988-90
- Bachelor of Science - Physics, UC San Diego, 1977-83. Minors in Electrical Engineering and Mathematics

WORK HISTORY

Google, Inc.

Jun 2011 – Jun 2015

Sr. Software Engineer.

- **Android Frameworks** (Jan '12-Jun '15). Responsible for maintaining and implementing new features in Android's Activity Manager and Window Manager on Jellybean, KitKat, Lollipop and Marshmallow releases. The Activity Manager is responsible for startup and shutdown of applications, activities, and services. The Window Manager is responsible for providing graphical resources to these activities and for controlling the visual transitions between activities. My responsibilities included coding new features (multi-windows, hooks for Android Wear, Android TV, and Android Auto), maintenance of existing code, and support for Google application writers.
- **Newsstand App** (Jun '11-Dec '11). Application for publication, delivery, and perusal of magazines in hi-resolution format. This tablet-only application never made it to market.

Coastal Senior Consulting, Inc.

Jan 2002 – Jun 2011

President. Contract programming for embedded systems. Customers include:

- **Secure TV** (Oct '10-Jun '11). Encryption products for MPEG data streams over satellite and IPTV networks.
- **eBook Technologies, Inc.** (Feb '10-Dec '10). Converting ebook reader in C/C++ to java/C++ Android environment. Extensive JNI coding as well as multithreaded applications. User Interface and graphics development.
- **Internal project** Created Android application for tracking billable hours.
- **Rovi (formerly Macrovision/Gemstar/TV Guide/Aptiv)** (Oct '07-'09). Java port of cable Set Top Box guide application from C++ to OCAP/tru2way platform. Implementations of DVR, user interface, network utilities.
- **Wind River** (Jun '07-Sep '07). Testing and fixing of Linux drivers for handheld wireless phones.
- **Verimatrix** (Jul '05-May '07). Conditional Access system for MPEG Transport IPTV video delivery systems. Client code running on the Set Top Box, server code running on linux and Windows

systems.

- Solekai Systems (Jul '04-Jul '05). DirecTV bitstream tool development. Windows C++ programming.
- Pioneer Digital Technologies (Jun '02-Jul '04). Cable TV Set Top Box development. Implemented PowerTV OS/API on linux base. Modified linux device drivers for Broadcom chip. Implemented DVR on linux raw filesystem. Implemented PowerKey conditional access API in linux.
- Personal Robotics, Inc. (Jan '02-Jun '02). Wrote simulator for vacuum cleaner robot vision system running on Linux. Simulator included creating random buildings with furniture in Virtual Reality Modeling Language (VRML). Displaying these worlds using OpenGL and POVray. Created user interfaces in gtk. Modeled movements and detected collisions with RAPID model library. Worked on mapping issues with robot.

MeKey, Inc.

Oct 2007 – Aug 2009

VP Engineering. Social Networking startup. Hardware design, coding and bring-up of PIC-based keyfob for securely transferring id's between fobs. Used Kicad EDA for schematic capture, pcb layout and gerbers. Assisted in design of backend web based infrastructure for escrow exchange of personal contact information. Company evolved into SMS-based technology (nobody wanted another gadget on their keychain). Patents applied for.

WIND RIVER SERVICES (formerly Doctor Design and Integrated Systems)

Sep 1992 – Jan 2002

Senior Member Technical Staff, Project Manager. Development, technical leadership and project management roles. Responsible for design and development of embedded computer and electronic systems. Tasks include: software and hardware implementation and debug; software and hardware architecture; design reviews, system specification; customer and vendor interface; proposal writing; formation and subsequent management of project teams.

Projects include:

- Microcoding and C code of Network Address Port Translation algorithm to C-5 Network Processor.
- C code to port multimedia middleware library to Set Top Box.
- Microcode for Motorola 8260 Communications Processor to assemble and route packets below the PowerPC level in a cell phone base station. Included writing a debugger in TCL/Tk.
- C code port of Bluetooth stack to VxWorks for Personal Digital Assistant. Architecture study for application manager for PDA.
- Architecture design and software specification for integration of TiVo consumer digital video recording system with DirecTV satellite reception.
- Cable Headend Transmitter – Architecture and management of team designing a rack-mounted device to receive messages over Ethernet and retransmit them over an RF cable-TV path.
- Set Top Box Software - Managed team of 15 engineers responsible for writing the software for second DirecTV Set Top Box on commercial market.
- Fingerprint Matching System – Cost reduction and performance enhancement of existing Automatic Fingerprint Identification System. Architected system, programmed Am29200 in C and assembly and three DSPs in C and assembly and design of two FPGAs.
- Wireless Cable Headend and Downconverter – Wrote C code and PIC assembly, architected and managed team responsible for design of a Wireless Cable (Microwave transmission) transmission and reception system. Design included MC68340, NTSC encoder, PIC16C65 and two custom FPGAs, DES Encryption/ Decryption.

Other projects include: architecture studies for various consumer devices, implementations of FPGA designs, design of network backup hardware, laptop security device, JAVA graphics porting, additional Set Top Boxes implementations, television Internet browser, bitstream generator capture system, fiber optic SCSI extender.

UC SAN DIEGO, COMPUTER SCIENCE AND ENGINEERING

Sep 1988-Aug 1990, Sep 1997-May 2000

Ph.D. Candidate, Graduate Fellow. Research in Evolutionary Robotics. Used evolutionary algorithms to discover grammars that developed body plans and neural network control structures for robots. Master's project was a study of transitions to Chaos in Cellular Automata Rule Space. Coursework included Computer Architecture, Compilers, Operating Systems, Algorithms and Data Structures, Software Engineering, Imperative and Functional Programming Languages, Complexity Theory, Artificial Intelligence, Neural Networks, and Cognitive Science.

DATA/WARE DEVELOPMENT

Aug 1983 – Sep 1992

Director of Engineering ('90-'92), Project Manager ('86-'88), Product Development Engineer ('83-'85).

Development of mainframe channel peripherals and test equipment.

TELEDYNE CONTROLS

Feb 1985 – Oct 1985

Member Technical Staff. Design and coding of bit-slice floating point coprocessor for data acquisition.

SCRIPPS INSTITUTE OF OCEANOGRAPHY

Sep 1981 – Aug 1983

Jr. Development Engineer. Design of devices for support and maintenance of geophysical observatory.

AWARDS AND HONORS

- Patent # 5,455,926 October 3, 1995 VIRTUAL ADDRESSING OF OPTICAL STORAGE MEDIA AS MAGNETIC TAPE EQUIVALENTS.
- Patent #5,438,674 Aug 1, 1995. OPTICAL DISK SYSTEM EMULATING MAGNETIC TAPE UNITS.
- UCSD CSE Award of Distinction for highest score on department Comprehensive exams 1990.
- National Science Foundation Fellowship 1989 – 90.
- Powell Foundation Fellowship 1988 – 89.
- Graduated Cum Laude, Physics, UCSD 1983.

OTHER INTERESTS

- Designed an Arduino shield to control a cube of LED panels I built. Fabricated and assembled the printed circuit board and programmed the Arduino. Demo applications written include: marquee text, cascade of colors, snake game, and fireworks. <https://github.com/cmautner/LED-Cube>, <https://github.com/cmautner/DiscodelicLib>. June 2016 – present.
- Remodel of a 1909 Edwardian in San Francisco's Bernal Heights. Seismic retrofit required adding moment frames, additional posts, beams, joists and rafters to existing structure. Replaced all existing services (gas lights, knob and tube electrical, galvanized water lines, telephone wiring) with new. Hallways and living space changed to open floor plan. Moved kitchen and bathrooms. Expanded attic rooms with vaulted ceilings. August 2015 – Jan 2017.
- Learning Spanish, CEPE Mexico City. March 2017 – April 2017.
- Member Board of Directors, Andytown Coffee Roasters, 2017 – present.
- President, Pi Properties Inc., 2001-present. Real estate investment holding company.
- Member Board of Directors, Bank of Hope, 2012 – 2017.
- General Manager, Mautner Family II, LLC. Glass bottle investment holding company. 2009 – present.
- President, Congregation Dor Hadash. Secular leader of 140 member Jewish Reconstructionist congregation. Responsible for committee makeup, budget, leading board meetings, selection of new rabbi. 2004 – 2005
- Member Board of Trustees, Congregation Dor Hadash, 1995 – 1998, 2004 – 2007.
- Board of Directors, LOLO Corporation. Toy company specializing in educational children's games. 2008 – 2010

PUBLICATIONS

Craig Mautner and Richard K. Belew. "Evolving Robotic Bauplans". In *Fifth Joint Symposium on Neural Computation*, page 93, University of California, San Diego, 1998. Institute for Neural Computation.

Craig Mautner & Richard K. Belew. "Evolving Robot Morphology and Control". *Proceedings of the Artificial Life and Robotics Conference (AROB99)*.

Craig Mautner & Richard K. Belew. "Coupling Morphology and Control in a Simulated Robot". in *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO) 1999*.