

Summary

An entrepreneur, digital video and multimedia expert, senior designer, and IP architect of CPU, DSP, video, and network processors, and marketing director with a talent for explaining the value of complex technologies from 12 years of experience in business development and design and verification, including leadership of ASIC/SOC/FPGA projects, market analysis, and customer meetings with makers of cost-sensitive and low-power devices for consumer electronics

Employment

YAP IP, Silicon Valley, California

Founder of startup, October 2008-January 2010

- Progressed from lead designer to team/product manager to venture financing seeker for a cache coherent multicore superscalar 7-stage pipelined RISC/DSP with SIMD extension for video (e.g. H.264), imaging (e.g. motion compensating de-interlacing), and comms (e.g. DVB-S2 FEC) processing
- Assessed overall market need and value proposition for cost competitive processor IP and developed product specification and documentation to serve the needs of prospective customers
- Assembled an ad-hoc advisory board of expert low-level DSP programmers in India, China, and America to define an optimal instruction set for video codec, image enhancement, and RF modem kernels
- Performed Verilog design and synthesis, designing around competitors' patent portfolios, and closing timing for a TSMC 90nm library
- Created an FPGA prototype, with a host software debug interface and a quick and dirty gcc compiler port and toolchain to support Linux and Google Android ports
- Developed an initial verification testbed, including TCL and shell scripting
- Created trade show booth and brochures and wrote magazine articles
- Represented the company on the Synopsys Users Group (SNUG) tech committee, reviewing papers about problems and EDA-based solutions of VMM verification methodologies and chip implementation, such as with physical synthesis

Tensilica & ARC International, Silicon Valley, California

Multimedia Marketing & Director of Solutions Architecture (Technical Sales / FAE), 2006-2008

- Monitored market trend leading indicators, planned future product requirements, and made CxO recommendations
- For two different video processor product lines, developed video processor architecture specs in coordination with international customers, internal developers, and off-shore codec software development partners
- Tracked development progress, bug reports, and resolution giving feedback to engineering team for continuous product improvement
- Worked on a horizontal team to address die size, power consumption, and performance trade-offs for mobile consumer multimedia devices
- Met with dozens of top tier prospects, gathered requirements, presented a cool FPGA demo, and closed 15 deals worldwide
- Handled two product launches, including collateral creation
- Wrote technical articles and white papers and gave presentations at conferences and a webcast
- Tracked bugs from discovery to resolution
- Represented the company on the SNUG tech committee as described above

Ultra Data, Waltham, MA, USA (acquired in 2005 by **Micronas**, Freiburg, Germany)

Co-Founder & Principal Design Engineer, 2003-2006

- Co-founded the company, which developed the first programmable processor architecture capable of 1080p decode of H.264 (AVC) and other video standards
- Developed the microarchitecture for a simple RISC, a SIMD VLIW DSP core, and an advanced 2D tiling DMA controller
- Performed and lead Verilog design, working with the back-end team, and driving the project to timing closure in UMC 90nm technology
- Created a verification testplan and testbed, which was later extended by the verification team
- Built working FPGA prototypes on both Altera and Xilinx-based boards for system validation and software development, including being the first external customer of Altera's Nios II processor
- Supported software bring-up of real-time H.264 decode by a multinational team
- Initiated sales and managed deals with top tier semiconductor and consumer electronics companies and gave the technical pitch to VCs
- Was awarded a patent, wrote papers, presented at conferences, chaired panels, gave lectures, evangelized video processor technology, developed marketing collateral, and built a respected brand identity
- Negotiated and closed the acquisition of the company, yielding a 15x ROI for investors

Lexra, Waltham, MA

Design Engineer, 1999-2002

- Designed synthesizable DSP MAC and instruction extensions to a Mips32 IP core for DSP applications, including digital cameras, DVD players, and WiFi devices
- Designed a high bandwidth crossbar for cache coherent multithreaded multicore network processors for networking/comms applications
- Designed semi- and full-custom critical path elements, modeled and simulated with SPICE, for use in structured custom circuit design
- Designed configurable 3 to 8 port register file for superscalar MIPS processor cores to support synthesized and structural latch, flop, and RAM based implementation in ASICs and FPGAs
- Contributed extensively to block and system level directed and random verification testing, failure triage, and debug using multiple simulators and Perl scripting for 10 different processor designs
- Designed, documented, and supported a FPGA-based devboard, including peripheral IP cores

Teradyne, Boston, MA

Test Development Engineer, 1998-1999

- Developed manufacturing test processes for digital and mixed-signal tester channel cards for disk drive chips

Rampage Systems, Waltham, MA

Engineering Intern, 1995-1997

- Automated manufacturing test and board-level debug and failure analysis of RMAs for PCI screener and film file processor boards
- Designed FPGA-controlled general-purpose PC peripheral hardware to perform testing
- Wrote a LAN network bandwidth test program

Consulting

Arasan Chip Systems, 2009

- Performed a prior art search, and drafted a patent application related to a NAND flash controller for SSD

Omnilala, 2005-present

- Advise CEO on SoC selection and review design specs, business strategy, and marketing collateral for media players and servers and other consumer networked audio/video entertainment products

VideoBits.org, 2004-2006

- Author, Editor, and Analyst
- Published a web-based tutorial on the principles of digital video
- Maintained detailed directory of hundreds of innovative video technology companies
- Maintained contact with technology implementers and leaders throughout the digital video business, connecting people with opportunities and lending insights
- Built a thorough collection of video coding stress test sequences

Poseidon Design Systems, 2006

- Developed a specification for a size and power efficient H.264 I-frame decoder IP core

On2 Technologies, 2004

- Wrote an opinion and testified as an expert witness in a binding arbitration case relating to video codec license fee payments

Altera, 2004

- Developed an IP core design specification with an eye towards testability and maintainability

Education

Cornell University, Ithaca, NY

Bachelor of Science in Electrical Engineering, 1994-1998

- Architected, designed, and prototyped Methos 16-bit RISC processor core
- Three years as teaching assistant for a freshman class on compact disc technology

Honors

- Westinghouse Science Talent Search 1994 semifinalist and Massachusetts State Science Fair first place winner for project *Identifying Bacteria by Their Reflectance Spectra*
- Embedded Processor Forum 2004 paper *The Ultra Data UD3000: A Next Generation Video Processor Core*
- 2006 Picture Coding Symposium (Beijing) invited paper *Architecture Considerations for Multi-Format Programmable Video Processors* (published in IEEE Journal of Signal Processing Systems for Signal, Image, and Video Technology)
- Invited guest lecturer on digital video technology at Cornell University
- 2005 International Engineering Consortium DesignVision Award nominee for Ultra Data UD3000 video processor

Industry Group Participation

- Synopsys Users Group (SNUG) Technical Committee member 2007-present
- Society of Motion Picture and Television Engineers (SMPTE) member 2005-present
- DesignCon Technical Program Committee member 2005-2008
- MPEG Industry Forum (MPEGIF) company representative 2006-2007

Selected Publications

- EE Times article *Processor architecture not a factor for low-power mobile systems*
- DSP DesignLine article *Who Killed My Battery?*
- DSP DesignLine article *Video Processing Pipeline Design*
- Tensilica white paper *A Designer's Guide to HD Video Pre- and Post-Processing*

- Portable Design Conference, *Truly Understanding Low-Power Multimedia Chip Design*
- Tensilica white paper *Frame Processing Time Deviations in Video Processors*
- Portable Design Magazine *Minimizing Power Consumption in a Mobile Video Subsystem*
- ARC white paper *A Brief History of Video Coding*
- DSP DesignLine article *Memory Bandwidth Metrics for Video Processing*
- Unpublished *Ghosts of Video Processors, Past, Present, and Future*
- GSPx 2006 paper *System Design Tricks for Lower-Power Video Processing*
- IEEE Journal of Signal Processing Systems for Signal, Image, and Video Technology *Architecture Considerations for Multi-Format Programmable Video Processors*
- DesignCon 2005 paper *The Trade-Offs of Software Programmability in Video Processors*
- GSPx 2004 paper *What Choices Make a Killer Video Processor Architecture*
- Embedded Processor Fourm *The Ultra Data UD3000: A Next Generation Video Processor*
- Microprocessor Forum 2001 paper *LX5380 RISC-DSP for New Internet Applications*
- DesignCon 2000 paper *Verification of Lexra Processor Cores*
- Microprocessor Forum 1999 paper *LX5280 High-Performance RISC-DSP for IP Licensing*

Skills

- Extensive world travel with basic communication in Mandarin Chinese, Spanish, and French
- Windows and Linux admin, X-Win, and SAMBA
- EDA tools including VCS, NC-Verilog XL, ModelSim, Design Compiler, IC Compiler, RTL Compiler, Prime Time, Synplify, Quartus II, ISE, Matlab
- Perl and Bash shell scripting, C and assembly language programming, HTML, XML
- MS Word, Excel, PowerPoint, Photoshop

Interests

- Wikipedia
- Sailing
- Languages
- Low cost consumer electronics gadgets
- Biking
- Green technologies