DAVID J. ERICKSON 6 Oak Drive Topsfield, MA 01983 508-887-9303

- **Objective:** To direct top-notch product development teams to develop leading edge products that meet customer and market needs.
- Management: Hands-on Engineering Management, Hardware Engineering and Project Management

Education: B.S.E.E., 1976 Worcester Polytechnic Institute, Worcester, MA

Design Analog processing including video, PLL, A/D, D/A, video timing, Specialties: video analog and digital LSI, graphics LCDs. Digital circuitry: Image memory (DRAM), multiport memory, pipelined image processors, bus interfaces, state machine, digital components used: PALs, DRAMs, SRAMs, PROMs, ASICs, TTL, ECL, PGAs (Xilinx, Actel, Altera), DSP blocks, FIFOs bit slice, VLSI. Instrument design for chemical and ATE industries. Medical (patient monitoring and display) electronics. Sensor interfacing, power supplies, low power design. Microprocessor hardware and firmware design, C and assembler: AVR, Z80 and 68hc11. Audio processing and control, amplifiers, test equipment. Marine and weather electronics. Troubleshooting all types of problems. Bus interfacing to MicroBus, VME/VXI, PC/AT, Multibus, Q-Bus LabView

Experience: STH Company (Consultant), Wayland, MA 4/02 - 9/02 Hardware and firmware design of Colorimeter Instrument redesign. Product development from specification to final release. Instrument uses an AVR microprocessor to implement a complete optical / chemical measurement instrument. Implemented complex acquisition timing, math, communications, display and serial interface, menu system. Development cost and product cost goals were met.

Analogic Corp., Peabody, MA 1/98 to 6/02

Chief Engineer, Test and Measurement Division Directed the engineering department of the division that was the leading 3^{rd} party

Supplier of mixed-signal instruments to the ATE industry. Products included VXI, VME, proprietary and rack mount arbitrary waveform generators and digitizers up to 4.8GHz and up to 20+ bits. Major customers were Credence, LTX, Advantest, Schlumberger, and Analog Devices. Managed the development of product lines of bench and VXI modular instruments, weigh scales and thermocouple instruments.

- ?? VXI DBS9900/901/902: 14 bit 100MHz ARB and 80 MHz Digitizer
- ?? VXI DBS9905/907/908: 1GHz and 2GHz oscilloscopes developed with Acqiris Co.
- ?? VXI DBS2050/2055: 2.4GHz and 4.8GHz Arbitrary waveform Generators (fastest in world)
- ?? DP7020/40 Common Instrument Platform with embedded Ethernet and GPIB controller to allow VXI instruments to be used as Benchtop instruments
- ?? AN3080 Low cost precision Weighing instrument
- ?? AN2800 32 channel precision Thermocouple digitizer

Managed the product support of three large ATE OEM products and legacy standard products.

Others:

TS-486 low power (<1W) embedded PC for Zeiss surveying instrument

Improved manufacturing yield of 120 dB 1MHz generator and digitizer from 0% to 80% at first test.

Datacube Inc., Danvers, MA	4/82 to present
Hardware Development Engineer	4/82 to 9/82
Manager / Director / VP of Engineering	9/82 to 12/98

Directed the engineering department from sales of \$1M to greater than \$15M. Responsible for Hardware, Software and Mechanical Engineers, Diagnostics, and product Documentation.

Engineering Budget of \$3M+ per year.

Brought company from single board frame grabbers through MaxVideo 10, 20, 200, 250, and MaxPCI products, the highest performance image processors available. Developed 40 MHz products that provided 10 Billion ops per PCI Bus slot for \$8K.

Put together a small, highly respected and productive engineering team. Managed and worked with very senior engineers. Trained junior engineers in design methodology, techniques, and technologies.

Set up systems for product definition and cost justification, product development, internal and user documentation, software development, diagnostics development, and manufacturing test.

Directed the engineering (Design Control) effort to obtain ISO-9001 certification (April 1996) and maintain it through surveillance audits.

Provided all aspects of people, product and program management including market study, proposal writing, product planning, product specification, design, design review, test, documentation, (customer and in-house), hiring, personnel, review, manpower allocation, communication between COO / President and Engineering, customer contact.

Directed the development group through several generations of image processing hardware including image memory, acquisition, display, spatial warping, processing, and disk storage and control software.

Technologies used range from TTL, ECL, CMOS and PALs through FPGAs and ASICs with familiarity gained on nearly every image and video processing device, memory, and programmable logic family.

Datacube is known for packaging high functional density on standard bus form factors. This is through gaining expertise in advanced packaging techniques.

Product families developed include the 123 and 128 Frame grabber families on QBus, Multibus, PC and AT busses, MaxVideo 10, 20, 200 and 250 families, MaxPCI, XI and MD1 totaling 30+ high performance board and system level products. Each generation of modular imaging products is based on open busses and module standards developed at Datacube.

Worked closely with many vendors to apply leading edge technologies. Datacube is / has been a beta site or early implementer for MMI, Xilinx, Altera, Actel, OKI ASICs, Brooktree, TRW, Sony, Sharp, Lattice, TI, Waferscale, and LSI Logic. In addition, Datacube was a key player in defining semiconductors from various vendors including:

TELMOS 1140: First complete video D/A IC (RAMDAC predecessor) LSI Logic: Several imaging devices Brooktree BT-251 Color space converter TRW TDC 2246 Image interpolator Sumitomo Metals 7x7 convolver: highest performance image filter

I personally designed products and standards for digitizing, storing, processing, and displaying real time video signals.

Products designed:

- ? 1997 Smart Camera: Digital acquisition hardware
- ? 1997 QI/QW Tester: 40 MHz digital camera simulator
- ? 1997 MaxAcq QW : Digital camera acquisition module
- ? 1997 MaxAcq QI: Digital camera acquisition module
- ? 1996 MV200 AS and AD acquisition module upgrades
- ? 1996 Video PLL module for all Datacube products
- ? 1995 MaxAcq QA: Dual 8 bit 40 MHz digitizer
- ? 1992 MV20 AD: MaxVideo 20 programmable digital input module
- ? 1991 MV20 AS: MaxVideo 20 programmable digitizer module
- ? 1991 MV20 AG: RAMDAC and video display module for MaxVideo 20
- ? 1991 MV10/20 Digi-12 and Digi-12/20: 12 bit 10/20 MHz digitizers

- ? 1989 MV10 MaxView D/A: Programmable high res.(125 MHz) display
- ? 1988 MV10 MaxScan analog front end: Programmable digitizer
- ? 1987 MV10 MaxMux ASIC Gate Array: Digital video crosspoint switch
- ? 1985 Framestore: triple DRAM image memories on VME board
- ? 1984 Digimax: Digitizing and display module for MaxVideo
- ? 1983 Designer / architect of concepts for MaxVideo family of products including MaxBus open standard digital video interconnect.
- ? 1983 IVG-128 IBM PC/XT bus Frame grabber
- ? 1982 QVG-123 Q-Bus Frame grabber
- ? Many in house test and interface projects.

Products I architected that were implemented by others:

- ? 1994 MaxPCI PCI Bus complete 40 MHz Modular Image processor: 10 Billion 8 bit image processing ops per second. MaxAcq subsystem: Analog and digital acquisition to 80 MB/sec. Display of real time video windows under Windows NT
- ? 1994 MaxAcq latest generation 40-120 MHz acquisition subsystem
- ? 1993 MaxBolt interface to SkyBolt array processor
- ? 1993 ASI Sensor interface box to simplify connecting to cameras
- ? 1993 MV20 MaxBolt: Interface MaxBus to SkyBolt array processor
- ? 1991 MV20 Max860 Interface MaxBus to CSPI i860 processing board
- ? 1987 MV10 MaxMux: digital crosspoint switch VME board.
- ? 1986 MV10 MaxGraph: Hitachi 63484 based graphics board for VME
- ? 1985 MaxBox: 20 slot VME Chassis.
- ? 1984 VG-150: intelligent bit slice 125 MHz graphics board.
- ? 1983 VG-128: (Multibus), VVG-128 (VME Bus), AT-428 (AT Bus) frame grabbers.
- ? 1982 VG-123: Multibus frame grabber.

Large development projects I managed:

- ? 1994-6 MaxPCI: Complete 40 MHz PCI bus image processor
- ? 1992 FSD High end image exploitation system for IBM FSD division
- ? 1990 MaxVideo 20: 3.5 Billion OPS in two 6U VME slots. Advanced acquisition, processing storage, display.
- ? 1983-4 MaxVideo: first seven boards of the MaxVideo 10 MHz modular VME image processing product line

Products developed by Datacube that I was involved in (design and spec reviews, problem resolution...):

- ? 1997 Three DSP image convolver modules with up to 16 BOPS each
- ? 1995-6 IXP Imaging crosspoint 150K Gate ASIC
- ? 1993 XI High performance display subsystem for X windows 1600 X 1280 display, imaging and graphics, 320 MB/Sec bandwidth, uses TI 34020.
- ? 1993 MD1 Digital image recorder storage and retrieval system. Uses SCSI-II disks to achieve up to 18 MB/Sec transfer rate per channel. Embedded 68020.

- ? 1992 FSD Warper: 4th generation warper: 12 bit 4 X 4 interpolator, 7th order address generation, double precision FP using TI 8847 bit-slice FPUs.
- ? 1992 MV20 VSIM: ASIC based image memory, used on all products. 130K gates, uses low cost DRAM to implement three port memory in three ICs including 400 MOPS of image processing.
- ? 1991 FSD Backing Store: 192 MB memory w/ 240 MB/SEC bandwidth
- ? 1991 MV20 Max860: MaxBus interface to CSPI i860 array processor
- ? 1991 MV20 mmNMAC MaxModule: 20 MHz 16 X 8 convolver
- ? 1991 MV20 Mini-Warper: third generation warper: Second order warping in small form factor. 50K gate ASIC,
- ? 1990 MV20 Max Modules for LUT and 20 MHz 8 X 8 median filter
- ? 1989 MV10 VFIR MKIII: 16 X 16 10 MHz convolver
- ? 1989 MV10 Featuremax MKII: 16 bit histogram and feature extractor
- ? 1989 MV10 SP MKII: general purpose DSP image processor
- ? 1988 MV10 MaxView Memory: 4 ported memory for display to 1280 X 1024
- ? 1987 MV10 VFIR MKII: 8 X 8 10 MHz convolver
- ? 1987 MV10 Addgen MKII and Interp. MKII: Second generation image warper with second order floating point address generation.
- ? 1986 VG-423S: single slot Multibus I frame grabber
- ? 1986 MV10 MaxSigma: large kernel (256 X 64) image Filter
- ? 1986 MV10 Megastore: 8/32 MB triple ported image memory
- ? 1986 MV10 ROIStore: triple ported image memory
- ? 1985 MV10 Euclid: ADSP2100 based DSP processor
- ? 1985 MV10 Interpolator, ADDGEN, XFS: real time image warper
- ? 1984 MV10 Protomax MK II: prototyping board
- ? 1984 MV10 VFIR: 3 X 3 convolution board
- ? 1984 MV10 MaxSP: single point general purpose image processor
- ? 1984 MV10 Featuremax: image histogram and featurelist
- ? 1983 SP-123: single point general purpose image processor for Q and Multibus
- ? 1982 VG-121, 124, 131: Multibus frame grabbers

Also designed systems for production test and burn in, selected CAD and CAE, other hardware and software tools.

- **10/81 to 4/82** Erickson Engineering (Self Employed Design Consultant)
 - Hardware / firmware design for various clients:
 - ? Colorimiter redesign for lower cost
 - ? Z-80 based Colorimeter: Analog, digital, firmware
 - ? Q Bus Frame grabber Analog design review and support
 - ? Low cost LCD telephone call timer
 - ? Telephone Least Cost Routing Device (6502 based)
 - ? STD bus modem interface and Z-80 control firmware

8/78 to 10/81 Octek, Inc. Burlington, MA Design Engineer for the Octek Consulting Group.

	Designed analog, digital and firmware products for diverse clients. Full project management (from contract negotiation, through delivery) for self and up to three engineers. Products developed in reverse order:
	? Neonatal Medical Monitor: Four engineer, 9 month project to develop ECG, Blood pressure, respiration, temperature all displayed on integral CRT. Battery powered. Personally designed ECG, blood pressure, patient isolation barrier, CRT electronics, deflection, high V, supply, character generator.
	? IBM Disk Pack test system: 6502 HW and firmware to exercise IBM 3340 removable winchester disk packs. Significant reverse engineering work.
	? Octek 2000 Frame Grabber: Designed video A/D, D/A, analog front end.
	? Floppy disk exerciser: Testing for forty 5 1/4" floppy drives.
	? Switching power supply: 100 Watt, multiple output.
	? Data Acquisition system: PL/M-80 code for data averaging.
	? Multibus based atmospheric data acquisition.
	? Card Embosser Controller: Digital and software enhancement to off the shelf data terminal. Z-80 HW and SW.
	? Colorimeter: Analog and digital instrumentation.
7/76 to 8/78	Hewlett Packard Medical Systems, Waltham, MA
	Hardware Development Engineer.
	Designed display circuitry for 68 KHz scan 40 MHz raster medical display, video D/A, video amplifier, vertical deflection, high voltage. RFI testing.
6/73 to 5/76	WPI TV Studio, Worcester, MA Head Technician
(student job)	Designed and built TV electronics, TV studios. Designed and built video / audio routing switcher, video distribution amplifiers, servo camera pan / tilt / zoom / focus unit for studio classroom. Repaired and designed video equipment for industrial / educational TV studios in the Worcester area.
Experience	CPU HW: AVR Rabbit 68hc11 6502 780 680X0 LSI-11 Bit Slice
with:	Logic: TTL, ECL, CMOS, PAL (100+ designs), ASIC, FPGA, EPLD, DSP Busses: PCI, VXI, VME, AT, Multibus I, O-Bus, STD,
	Software Languages: C, Dynamic C, LabView, Assembly,
	Hardware Languages: AHDL, ABEL, CUPL, PALASM
	Assembly: Z80, 68hc11, 6502, Macro-11,
	Tools: Pspice, Viewlogic / PowerView ViewDraw and ViewSim, Altera MaxPlus, Xilinx XACT, Actel Designer, Protel schematic, Eagle CAD, MS
	Office, MathCAD Operating Systems (user): Windows, UNIX, MS-DOS, RT-11, OS-9, LynxOS
Personal	Developed 68hc11 Rabbit and AVR based projects for home and boat
Engineering:	Developed LCD graphics controller chips (FPGA) for several graphics LCD
	panels. Article in CCINK 5/93.
	Built audio equipment including speakers, amplifiers, preamps, PC based test equipment frequency response measurement system and a 68hc11 based house wide audio system
	nouse-wide audio system. Built maintained and networked several home PCs
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Enjoy repairing and recycling all types of equipment. Served on Topsfield public school technology committee.

ProfessionalSPIE International Society of Optical Engineers,**Organizations:**SME Machine Vision Association

Papers:	 EI 10/87 "Implementation for High Resolution Image Processing" SPIE 10/87 "A Modular Architecture for Variable Resolution Image Processing" SPSE 5/89 "Algorithms Translated into Hardware" Circuit Cellar Ink 5/93 "Graphic LCD for Embedded Control" describes the design and application of a graphic LCD chip IEEE 4/99 "An Architecture for a 2.4 GHz Arbitrary Waveform Generator"
Outside	IEEE 4/99 "An Architecture for a 2.4 GHz Arbitrary Waveform Generator" Sailing, sailboat restoration, windsurfing, woodworking, electronics design

Interests: for home audio, home control, marine and weather instrumentation, home PC.