

## Summary and Specialties

Software, Electrical, and Mechanical Engineer with 25 years of design, implementation, and management experience in simple-to-complex embedded electromechanical, machine vision, and alternative energy applications. Proven ability to generate extremely reliable hardware/software solutions requiring low-maintenance and delivering high availability, manufacturability, testability, and ease-of-use. Proven track record of extremely rapid software design as well as concurrent hardware/software design, implementation, and debug.

**General Skills** Embedded systems, software, firmware, programmable logic, electromechanical systems, analog/digital electronic design, object-oriented hardware and software design, hardware/software fusion, system design (component, PCB, system), PCB design, layout, fab, rework, troubleshooting

**Programming** Expert level in APL, BASIC/VB, C/C++ (gcc, Microsoft VS), Concurrent-C, Forth, FORTRAN, LabView, Pascal, PL/I, Assembly (ARM, Atmel, Intel(straight/MMX), Motorola, TI, Zilog), specialty (bitslice, DSP, soft processors/NIOS, custom), web (Java, PHP, Python, Perl)

**Operating Sys** Expert level in CP/M, DOS, Mac OS X, UNIX/Linux (embedded, RedHat, SUSE, Ubuntu), Windows(3.1 through XP/Vista), custom design for embedded or RTOS

**Hardware** Expert electronic designer schematic through PCB layout for embedded systems with programmable logic/VHDL/Verilog (Xilinx/Vertex/Spartan, Altera/Stratix/Cyclone), DSP (ADI, TMS320x), USB, DC-DC conversion, mixed analog/digital/power sections, comm (RS-232, USB, PC-104)

**Engineering Apps** Expert level in Altium Designer, Cadence/Orcad (Capture/Layout/Spice), Inventor, ISE, KDE, Mathematica, MATLAB, Quartus, Visual Studio, Xcode

**Patents** US Patent #7270900: Automatic Measurement of Fuel Cell Resistance  
US Patent #7362073: Dynamic Fuel Cell System Management Controller

**Education**

- BS in Mechanical and Aerospace Engineering, Princeton University, 1984  
Concentration: aerospace systems, robotics, computer graphics, microprocessor-based control
- MS in Electrical Engineering, University of Vermont, 1987  
Thesis: "Two Graph Theoretic Reformulations of the PLA Folding Problem with Algorithms"  
Focus: Microcontroller chip design, microcontroller systems, signal processing, image analysis
- PhD in Electrical and Computer Engineering, University of Vermont, 1999  
Dissertation: "A Cognitive Computing Architecture"  
Focus: cognitive hardware methodologies using FPGA and DSP

**Work Experience** *Present: Owner, Lecky Integration, Little Falls, NY*

- Run 6-person firm specializing in product design services for technical end users, manufacturers, and system integrators designing and deploying solutions combining embedded systems, machine vision, robotics, power management, and real-time performance  
For a list of clients, projects and more information, please see our website, [www.lecky.com](http://www.lecky.com)

*04/06 – 09/07: Senior Intelligent Real-time System Engineer, GE Global Research, Niskayuna, NY*

- Designed and developed FPGA and DSP hardware architectures for confidential programs for The Department of Homeland Security, Lockheed-Martin, and the US Navy
- Worked with radiation detection, aircraft power generation, and MRI applications
- Developed proposals and architectures for next-generation GE products and technologies

*10/04 – 10/05: Engineering Manager, Simmons Machine Tool Corp., Albany, NY*

- Managed 15-person team of mechanical, electrical, and software engineers, tech writers, drafters, and support personnel designing heavy equipment for railroad manufacturing applications
- Supervised final line installation and acceptance at major customer site in China
- Introduced 3D design technology and practice for new machine designs

*10/02 – 10/04: Electrical Engineering Manager, MTI MicroFuel Cells, Inc., Albany, NY*

- Managed 5-person team of electrical engineers, software engineers, and electronics technicians
- Designed and developed electronic hardware, firmware, and VB support clients for embedded control systems for mobile fuel cell systems

## Work Experience (cont.)

- Developed complete RTOS with monitoring tasks for DC-DC conversion, interprocessor communications, and dynamic control of fuel cell array electronics, valves, pumps, and fans
- Developed complete USB acquisition and control products from concept through production

### **7/99 – 12/02: Assistant Professor of Electrical and Computer Engineering, University of Vermont, Burlington, VT**

- Designed and delivered undergraduate and graduate courses in digital design, computer architecture, embedded systems, image processing, and neural network implementation
- Developed new graduate courses in Neural Control of Robotic Manipulators, Machine Vision, and FPGA-based microprocessor and system-on-a-chip design using VHDL
- Developed a new undergraduate course in Electrical Engineering Concepts for non-majors

### **12/98 – 7/99: Member of Technical Staff, Hill Associates, Colchester, VT**

- Trained technical and non-technical staff in data networking and security topics
- Taught Dense Wavelength Division Multiplexing (DWDM), SONET, and Internet technology to audiences at Bell Atlantic, USWest, SBC, Motorola, Frontier, Sprint, and Lucent

### **11/95 – 12/98: Director of Machine Vision Software Products, Imaging Technology, Bedford, MA**

- Managed technical and product line definition for industrial imaging products
- Designed and directed development of new hardware and software products for pattern recognition and high-speed image processing
- Recoded and optimized complete vision libraries for multiscalar and parallel processing

### **12/85 – 11/95: President, Intelec Corporation, Williston, VT**

- Built \$2M machine vision software company sold to Imaging Technology 11/95
- Invented Prophecy machine vision computer and Sherlock machine vision software
- Developed dozens of machine vision hardware and software interfaces and algorithms for inspection, gauging, and robot guidance

### **6/89 – 7/90: Member of Technical Staff, Hill Associates, Colchester, VT**

- Developed and delivered data networking training programs at Bell Laboratories, Bell Atlantic, Ameritech, PacTel, Southwestern Bell, and the US Army in the areas of data communications, client/server architectures, operating systems, and object-oriented programming

### **7/85 – 6/89: Owner, Lecky Engineering and Development, Burlington, VT**

- Consulted in RTOS and microcode development for industrial machine vision applications
- Developed custom software and algorithms for factory automation applications
- Served as lecturer at University of Vermont in EE: digital design and signals/systems

### **5/84 – 12/85: Systems Engineer, Control Automation, Princeton, NJ**

- Developed, installed, and supported embedded software, firmware, and microcode for automated printed circuit board inspection systems
- Developed optical and illumination strategies to improve automated inspection

## Publications

- “Open Source Machine Vision with Linux and OpenCV”, Quality, 4/09
- “Security Cameras for Machine Vision?”, Quality, 2/09
- “Practical, Secure Embedded Wireless Communications”, Control Design, 1/09
- “OEM Insight: Column on Closed Loop Vision Systems”, Control Design, 11/08 and 12/08
- “Time for Gigabit Ethernet in Machine Vision”, Quality, 9/08
- “Programming Success”, interview in Vision Systems Design, 5/08
- “Why do we say ‘Machine’ Vision?”, Machine Vision Online, 11/00
- “Programming Machine Vision Algorithms”, tutorial, AIA Vision Show West, 10/00
- “An Optical Character Recognition Algorithm”, AIA Vision Show East, 4/00
- “IEEE-1394 for Machine Vision”, Advanced Imaging, 10/00
- “The Scout Cluster Architecture for Cognitive Computing”, IJCCNN, 7/99
- “Using Scout Clusters for Motion Planning”, Int’l Joint Conf. On Neural Networks Proceedings, 7/99
- “MMX Speeds Machine Vision Algorithms”, Personal Engineering & Instrumentation News, 10/98
- “Machine Vision Markets Now: The Impact of Getting Easier”, Advanced Imaging, 2/98
- “True End-User PC Industrial Imaging: Easing Use for the Non-Programmer”, Advanced Imaging, 6/95
- “Machine Vision Speeds Automotive Assembly Inspection”, Modern Application News, 5/95
- “Machine Vision: Right Off The Shelf”, Sensors, 9/94
- “Graph Theoretic Algorithms for the PLA Folding Problem”, IEEE Trans CADICS, 7/89
- “Graph Theoretic Algorithms for PLA Folding”, Proceedings of the 30th Midwest Symposium on Circuits and Systems, 8/87
- “Implementing FORTH on the 80386”, The Journal of Forth Application and Research, Vol. 4, 1987
- “COMICAL: A Forth-based Programming Language for Optimized Array Processor Programming”, The Journal of Forth Application and Research, Vol. 2, 1986
- “Forth for Computer Vision in Industrial Applications”, Robotics Age, 4/85

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