

Eric Hernandez

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Objective: To contribute and further the development of useful applications in the area of computer engineering and other engineering related disciplines, emphasizing in embedded systems and firmware.

Education:

Master's GPA: X.X
20xx-20xx California State University, Long Beach (CSULB)
Master of Science, Computer Science with an option in Engineering
20xx-20xx California State University, Long Beach (CSULB)
Bachelor of Science, Computer Engineering

Skills: Languages: Embedded C/C++, Assembly (80x86, 8051, Arm, AVR, PIC), Verilog, VHDL, Visual Studio .NET
IDEs and Other: GNU and Eclipse, Code Composer, IAR, Keil, Cadence Tools, Xilinx ISE/EDK, SPICE, Orcad, Altium, SVN Revision Control
Emphasis: Microcontrollers and Embedded Systems under Windows and Unix/Linux, Verilog and VHDL Modeling, FPGA Prototyping

Organizational Affiliations:

Member - CSULB Computer Engineering Curriculum Advisory Board
President - Micromouse - Autonomous maze solving robot team
Representative - Associated Engineering Student Body (AESB)
Member - Embedded Applications Technology (EAT) and ACM

Work Experience:

2012-Current EBus Inc. - Downey, CA
Research, development, and production of electric bus transit technology.
Software Project Engineer - Embedded Software and Hardware Development, emphasizing in fuel cell power delivery systems.

2009-2012 Dice Electronics - Signal Hill, CA
2004-2007 Car Audio Integration; iPod, Sirius, BlueTooth, Flash Drives
Embedded Systems Engineer - Embedded Software Development, Hardware Design, PCB Design.

2007-2009 NDT Systems - Huntington Beach, CA
Portable Ultrasonic Non-Destructive Testing Units
Contractor: Embedded Systems Engineer - Embedded Software Development, FPGA Prototyping, GUI Development.

2007-2008 Intelligent Energy - Long Beach, CA
Fuel Cell Control Systems Design and Industrial Controlling
Contractor: Embedded Systems Engineer - Embedded Software Development, Hardware Design, PCB Design.

2001-2003 Academic Computing Services - CSULB, Long Beach, CA
Computer Lab Consultant - Assisted students and maintained lab

1999-2001 ACE Hardware, Long Beach, CA - *Clerk, Sales Assistant*

1997-2002 Martial Arts Training Center - Long Beach, CA - *Instructor*

Company Projects

Ebus Inc.: A company specializing in the production of electric bus transit technology. From research and development to production, Ebus has pioneered large passenger buses to “old town” trolleys using a variety of electric platforms. These systems include all-electric, natural gas hybrid and fuel cell based technologies. My primary focus at this company has been a proprietary fuel cell boost power converter designed from the ground up to deliver current on demand. The converter performs this function using a TI TMS320 Digital Signal Microcontroller. Boost is achieved by a 3-phase interleaved DC/DC converter implemented with 6 IGBTs, each driven by PWM and controlled by PID. Multiple sensors and transducers are monitored to ensure fuel cell safety, efficiency and longevity. Other responsibilities include collaborative design, testing and troubleshooting of battery management systems.

Dice Electronics: A consumer electronics company which designed In-Car-Entertainment devices. All of our devices communicated on the car’s proprietary internal bus, which had to be reverse engineered. I was responsible for the hardware, protocol, and communication of Toyota, Honda, and BMW. Our products integrated the iPod and iPhone as well as Sirius Satellite, flash drives, and Bluetooth enabled cell phones. Other non-product designs included data loggers, production QA and testing hardware/software.

NDT Systems: Design of portable ultrasonic flaw detection units for inspection of metals, composites and laminates. I collaborated in the design of the embedded software, as well as writing the end user software for data retrieval and analysis of the measurements. Another project included an FPGA implementation of a PCI Bridge that emulated the Atmel Atmega series GPIO for hardware testing and verification.

Intelligent Energy: Research and development of a 400 watt hydrogen fuel cell controller for the application of powering 110v AC devices. Also included in the design was a graphical display and input device used for monitoring different fuel cell performance metrics. Sensing and data acquisition included; temperature, differential pressure of the hydrogen tank, current and voltage. Other projects included valve controllers using both dc and stepper motors, as well as various solenoid valve controllers.

CSULB Academic Projects

FPGA based HDMI Machine Vision: A graduate directed research project under a supervising professor. The project implemented an HDMI input and output device capable of image and video manipulation via machine vision techniques. Using a Spartan 6 FPGA board, the project performed real-time hardware grayscale of an HDMI video feed and software based convolution with Sobel operators for edge detection. A MicroBlaze soft-core processor under the Xilinx EDK suite was used to run the software and control the HDMI IP cores and framebuffer which resided in DDR2 memory.

Superion: A semester project to create a 64-bit RISC microprocessor design that aimed to combine the simplicity and reduced size of a RISC CPU, while allowing for a greater degree of instruction flexibility traditionally found in CISC machines. Noteworthy additions to the base design were a powerful barrel shifter and a radix-4 integer multiplier. This design was fully synthesized and verified through test benches and sample programs.

Micromouse: A team effort to create an autonomous maze-solving robot. The Micromouse robot used a Philips ARM7 MCU to provide system control. Movement was accomplished via two DC motors on a differential robotics platform. Motor control was handled by two concurrent PID control loops and infrared sensors were used for both obstacle recognition and distance. Initial maze traversal was decided by a Depth First Search and later, solved by a Bellman Flood-Fill algorithm for the shortest path.