Alex Vassallo

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Skills

Languages:	Java, C/C++, SML, Racket, Ruby, Linux Bash, x86 Assembly, Android
Tools:	Eclipse, Arduino, GIT/SVN, Emacs, Quartus, Active-HDL, GDB, Matlab
Hardware:	Soldering, Prototyping circuits, Digital ICs, Opamps, Filters, Micro-controllers

Education

University of Washington, B.S. in Computer Science — GPA 3.55 — Dec 2015

Academic Experience

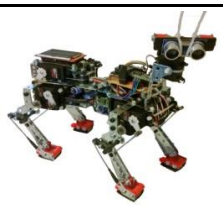
Hardware	Analog signal amplification and filtering; Transistor gates; Digital circuits; Decoders; ALU's; Cache design; Memory design; Processor architecture; Pipelining; Context switching; SPI bus; I2C bus; Interrupts; ARM Cortex; Constructed complete y86 processor in Active-HDL for FPGA
Software	Abstract Data Types; Data Trees; Sorting methods; Multi-threading; Locks & Concurrency; State Machines; Regular Expressions; Dijkstra's Algorithm; Digital Filters; Decision trees; Neural networks; Bayesian Learning; Buffer overflow attacks; Cryptography; Cookies; Web security, Android apps
Java	Exception handling; Generics; Subclasses; User Interfaces; Version Control (SVN); Fork/Join; Developed interactive campus map for shortest path; Designed multi-threaded query engine; Designed Netflix movie recommender (Bayesian Learner); Designed self-learning spam filter
C/C++	References; Smart Pointers; Templates; Inheritance; Sockets; POSIX; Multi-threading (Fork/Exec); Developed web-based document search engine; Designed Linux operating system components (os161)
Math	Predicate Logic; Modular Arithmetic; Proofs; Discrete & Conditional Probabilities; Limit Theorems; Maximum Likelihood Estimators; Jacobi & Gauss iterations; Differential Equations; Matrix Algebra

Recent Projects

Motor Quadrature Decoder

Using the onboard peripherals of the Freescale K20 micro-controller, this device measures and analyzes the quadrature signal used for motor control. Tracks position, motor speed, pulse width, home and limit positions, and reports them to the LCD screen and USB port. Includes a full moving graph with automatic scaling, and a settings menu.

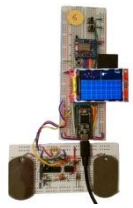
http://alexvassallo.com/Projects/MotorTester/MotorTester.pdf



Walking Robot

Based around an ARM Cortex-M4 processor, it uses 9 high torque PWM servos, Gyro/Accelerometer MPU, LCD screen, ultrasonic range finder, Bluetooth module, independent voltage converters, and locally available metal and plastic hardware. It features an auto-stabilization system, forward looking radar, and an Android application for control.

http://alexvassallo.com/Projects/Robot/Robot.pdf



Heartbeat Monitor

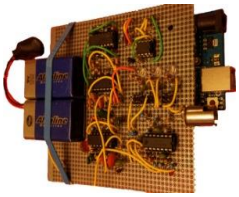
Utilized an Arm Cortex-M4 processor to capture and analyze heartbeat signals produced by the voltage difference across two electrodes. During my last quarter, I used my hardware knowledge to enhance the amplification circuit for the entire class, and then developed software that efficiently filtered, detected, and captured heartbeat rhythms onto the SD card.

http://alexvassallo.com/Projects/HeartRateMonitor/Heartbeat.pdf

On-Board Diagnostic (OBD2) Emulator

Designed to allow a vehicle that is not installed with a standard On-Board Diagnostic system to communicate with diagnostic testing equipment using the standard OBD port. This emulator can transmit either real or false data to the testing device, and can emulate most of the features used by OBD2 vehicles.

http://alexvassallo.com/Projects/OBD2/OBD2.pdf



Optical Receiver

Built around the ATmega328P processor, it utilizes 17 Op-amps that filters and decodes Frequency Modulated data being transmitted by an IR LED from a central base station. It features automatic gain control, automatic baud rate detection, error calculations, and reports the data to the serial port.

http://alexvassallo.com/Projects/OpticalReceiver/OpticalReceiver.pdf

Work Experience

Washington Army National Guard (Redmond, WA), Infantry 11C **Dec 2007 - Dec 2015**

- Redesigned standard procedure for computing mortar firing data using geometric mathematics, on my own time, resulting in an Army Commendation Medal for accuracy, efficiency, and “tireless work ethic, dedication to platoon and desire to be the best".
- Supervised and trained soldiers to be combat effective and independently reliable.
- Deployed in support of Operation Iraqi Freedom, Aug 2008 to Sept 2009.

Alex Remodeling, Owner, General Construction (Bothell, WA) **Mar 2006 - Dec 2007**

- Successfully coordinated employees and equipment for an optimized work calendar.
- Communicated customer's requests to all workers to ensure final product success.

Systems Administrator, American Dream Mortgage (Lynnwood, WA) **July 2005 - Mar 2006**

- Designed and maintained an efficient computer network infrastructure for use by all employees.
- Supported loan application software that utilized a network shared Access 2003 database.
- Processed loan applications and underwriting for home mortgage packets.

Network Administrator, Secor International (Kirkland, WA) **Mar 2003 - Mar 2004**

- Managed domain user accounts, cell-phone plans, and file permissions.
- Supported 50 nation-wide offices with technical support and product setup.
- Developed software for automation of ordering systems and network administration.
- Developed software for tracking and reporting inventory using SQL, Access, and VB6.
- Traveled to remote offices to perform upgrades and address specific issues.

Microsoft Windows 9x Technician, Keane Inc (Kirkland, WA) **Nov 1999 - Mar 2001**

- Provided technical support for Windows 95/98/ME platforms including related applications.
- Provided solutions while maintaining a minimum call length and maximum customer satisfaction.
- Remained current on technical and compatibility issues with 3rd party software.
- Studied Visual Basic and Microsoft preferred software programming architecture.
- Developed custom call log software using VB6 that interfaced with company software.

Awards

- Deans List (3.5+ GPA).
- Google Endowed Scholarship in Computer Science & Engineering.
- Army Commendation Medal with Bronze Oak Leaf Cluster, Good Conduct Medal, and Drivers Badge.

Hobbies/Activities

- **R/C Aircraft** -Aerodynamics; Wing design; On-board auto-pilot systems
- **Automotive** -Forced induction performance; Diagnostics; ECU management
- **Soccer** -Redmond Men's Open League / Arena Sports Indoor (goalkeeper)
- **Youth Coaching** -Northlake Little League Baseball (2012-current)
  -Northshore Youth Soccer Association (2011-current)

Past Projects

Piston Performance Monitor	Used an Arduino Uno to monitor a crankshaft angle sensor and measure the acceleration of each individual piston during each phase of combustion. This tool analyzed the data to detect specific problems and identify the culprit cylinder.
Video Object Detection	Used streaming video from stationary camera to identify new objects against known background. Used a decision tree to identify and report each object.
Military Vehicle Audio Interface	In Iraq, reverse engineered a combat vehicle's internal intercom system and developed an electronic interface which allowed soldiers to play music and use personal headsets.
Call Center Software	Developed own Windows Technician software using Visual Basic 6 that streamlined the support call and stored common problems as templates. Used core API's to locate window handles and manipulate all the menus of tedious company software provided.