Joshua Vasquez

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EDUCATION

HARVEY MUDD COLLEGE
Bachelors of Science in Engineering
May, 2014

RELEVANT COURSEWORK

CS070: Data Structures
MATH055: Discrete Mathematics
ENGR083: Continuum Mechanics
ENGR151: Engineering Electronics
ENGR155: Microprocessor Systems
ENGR190: Autonomous Robot Navigation

PERSONAL PROJECTS

whimsical projects designed after-hours:
www.doublejumpelectric.com

SKILLS

PROGRAMMING
C++ • C • Arduino
Python • ARM Assembly • Bash • Matlab

HARDWARE DESCRIPTION
SystemVerilog

VERSION CONTROL
Git (except rebasing) • SVN

SOFTWARE TOOLS
Linux Operating System
Make • CMake
LinuxCNC • ROS • OpenFrameworks
GNUPlot • libUSB • Wireshark
LaTeX• Altera Quartus 15

MICROCONTROLLERS
ATMEGA and ATTINY families
PIC32 • STM32Fx family

PERIPHERALS
UART • I^2C • SPI • CANbus • PWM
Interrupts

EMBEDDED TOOLCHAINS
avr-gcc • arm-none-eabi-g++

WORKBENCH TOOLS
Logic Analyzer • Oscilloscope

PCB DESIGN
KiCAD • EAGLE • PADs

RAPID PROTOTYPING TOOLS
Solidworks CAD
3-axis CNC milling • CNC lathe
laser-cutting with a 60[W] CO_2 laser
SLA-based 3D printing

WORK EXPERIENCE

ROBERT BOSCH LLC | Hardware Engineering Intern
May 2012 – Aug 2012 and May 2014 - Aug 2014 | Palo Alto, CA

- In 2012 I wrote a collection of MEMs sensor drivers addressable over a generic hardware abstraction layer. In 2014 I co-developed the firmware and mechanical design for a ball-balancing robot.

MAYFIELD ROBOTICS | Mechatronics Engineer
September 2014 – Current | Palo Alto, CA

- I develop proof-of-concept robot bases for a consumer home-robot. I have written the embedded firmware and C++ ROS driver for custom mobile bases, produced both the PCB and firmware for a sensored brushless motor controller, and fabricated several laser-cut bases to test possible features in the product's development phase. I am currently designing a small scale dynamometer.

HACKADAY | Contributing Author
December 2014 – Current

- I document other engineers' clever tricks and publish original tutorials.

RESEARCH

LAB FOR AUTONOMOUS AND INTELLIGENT ROBOTICS | Researcher
May 2013 - December 2013 | Harvey Mudd College

- Designed and implemented a remotely operated rotating underwater sonar mount, addressable over a CAN-bus interface and controllable through a Python script in ROS.

DIGITAL DESIGN COURSE DEVELOPMENT | Researcher
September 2013 - September 2014 | Harvey Mudd College

- Codeveloped a Raspberry Pi Peripherals Library and wrote several examples of basic usage for the 3rd Edition of **Digital Design and Computer Archictecture** by David Harris and Sarah Harris

AWARDS

2010	Eagle Scout
2010	Letter of Commendation for Superior Academic Performance
2012-2014	Dean's List
2013	Eugene H. Kopp merit-based Scholarship Recipient
2014	Departmental Honors in Engineering

RECENT PERSONAL PROJECTS

FPGA-BASED PERIPHERAL EXPANDER February 2015

- For proof-of-concepts with a tight time constraint, synthesizing an extra peripheral or two may be faster than porting code to a different microprocessor. I synthezied a memory-mapped SPI-interface on an FPGA, allowing users to rapidly add peripherals to an existing system.

PARTICLE FILTER IMPLEMENTATION July 2014

- I wrote a particle filter for localization of a diff-drive robot with graphics rendered in OpenFrameworks