Ethan Michael Harte

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Education

University of California, Santa Cruz **September 2013 – June 2017**

Bachelors of Science with Honors in Computer Engineering with a focus on Digital Hardware.

Course Work:

- Microprocessor System Design
- Computer Architecture
- Digital Signal Processing
- Logic Design with Verilog
- Signals and Systems
- Analog Circuits
- VLSI Digital System Design
- Logic Design
- Intro to Circuits
- Algorithms and Abstract Data Types
- Data Structures
- Computer Systems and C Programming
- Computer Systems and Assembly Language
- Technical Writing

Experience

Computer Science Database Systems II Staff **April 2017 – June 2017**

Tutor and Grader **UC Santa Cruz**

- Graded assignments for Professor Sheldon Finkelstein's Database Systems CS capstone course.
- Tested student's implementation of database systems using C++ test benches.
- Assisted students with questions regarding C++ and course concepts.

RT-2M Replacement Senior Design Project **January 2017 – June 2017**

Lead DSP Engineer **Plantronics**

- Interdisciplinary senior design project that maintained a professional relationship with Plantronics through biweekly progress evaluations.
- Designed LabVIEW software for the NI cRIO to replace Plantronics' outdated audio test equipment.
- Utilized event driven, object oriented, and multithreaded LabVIEW code for a robust software architecture.
- Engineered Digital Signal Processing algorithms for crest factor optimization, calibration, and audio signal generation and analysis.
- Successfully provided Plantronics with a working prototype of an RT-2M replacement tester.
- Worked in a team of six.

Leeps Lab Research Intern **December 2015 – December 2016**

Lead Software Engineer **UC Santa Cruz**

leeps.ucsc.edu

- Worked under Professor Kristian Vargas Lopez on a behavioral economics project.
- Developed a facial recognition program to determine and log the emotional state of a subject.
- Programmed using Affdex, Boost, and OpenCV C++ SDKs in a Linux environment.
- Utilized Shimmer Sensors to log heart rate (PPG) and skin conductance (GSR) data.
- Configured pilot experiments involving collecting data from student volunteer subjects.

Projects

Sit/Stand Desk Personal Project **August 2017 – June 2018**

- Designed and built a desk that can move up and down using an Arduino based embedded system that controls two linear actuators and a user interface (LED buttons and an LCD screen).
- Programmed a manual mode for the user to control the desk, an automatic mode where the user can specify a time interval for the desk to alternate between two heights, and the ability to save presets.
- Filtered out unwanted RF produced by the motors in the linear actuators.

RISC V CPU Synthesis Project **January 2016 – March 2016**
Class: Logic Design with Verilog **UC Santa Cruz**

- Synthesized a RISC V instruction set architecture CPU using Verilog.
- Designed using a three-stage fluid pipeline (fetch, decode, and execute) for better throughput.
- Implemented C++ testbenches to mimic an operating system for the CPU.
- Verified functionality using GTKWave and Yosys.

WalkVR - Hackathon Project **October 2015**
Lead Map Developer **CalHacks2.0**

- Developed a 3D environment using Unreal Engine for testing the features of our VR hardware.
- Used an Oculus Rift DK2, Leep Motion, and Myo Armband to create a full VR experience.
- Leep Motion tracked hand gestures while the Myo Armband was worn around the ankle to track walking.
- Worked in a team of five.

ObjectRekt – Hackathon Project **June 2015**
Embedded Software Developer **Flir Hackathon**

- Utilized the Flir Lepton longwave infrared thermal imager, Raspberry Pi, and OpenCV to create an automated camera that observes the scene and tracks a presenter's location, panning to the proper locations.
- Developed C++ program that determines the presenter's subject (whiteboard, projection, etc.) using an object recognition and then, using the Lepton Python SDK, the system recognizes the presenter's location and pans the camera accordingly to accommodate both the presenter and their subject.
- Worked in a team of five.

SlugTrails – Hackathon Project **January 2015**
Software Developer **HackUCSC**

- Developed an Android and IOS app with the purpose of crowdsourcing wildlife sightings.
- Implemented the Google Maps SDK to allow the user to tag their location with a time, animal, and a description of the sighting. This data was added to a database.
- Tested app using data generated form a Python script
- Taught myself C# for developing apps on Apple devices.
- Worked in a team of five.

Emocar - Sponsor Prize at CalHacks Hackathon **October 2014**
Lead Embedded Software Engineer **CalHacks**

- Designed a brain-computer interface that allows a user to control an Arduino rover with their mind.
- Utilized a machine learning algorithm to detect patterns in noisy data. Used this to determine if the raw EEG data matched a command for the rover.
- Won a sponsor prize for most connected project.
- Worked in a team of four.

Hartbeat - Alpha Game Jam Project **September 2014**
Lead Hardware Engineer & Lead Map Developer **Alpha Game Jam**

- Engineered an embedded system that captured the user's heartrate using an optical heartrate sensor and a pulse width modulation algorithm.
- Utilized the heartrate data to affect bullet spread radius to a first-person shooter testing environment we developed in UDK and UnrealScript.
- Developed map environment and heads-up display graphics.
- Worked in a team of six.

FindAR - First Place at HeroHacks Hackathon **August 2014**
Software Engineer **Hero Hacks**

- FindAR is an augmented reality headset made from an Oculus Rift with a webcam mounted on top.
- Learned filter algorithms using OpenCV such as: filter by color, facial recognition, object detection, and various other filters.
- Taught myself Python and C++ for this event. Used this knowledge to help layout our main program.
- Worked in a team of five.

Skills

5yrs: Embedded System Design (RTOS/FPGA, NI cRIO, Cypress PSoC5, Xilinx FPGA, Arduino, PIC)
5yrs: Git for large scale version control and project development.
3yrs: Digital and Analog Circuit Design and Analysis
2yrs: Hardware Synthesis and VHDL (Verilog and System Verilog)
2yrs: Computer Vision
1yr: Digital Signal Processing

Languages:	**Libraries:**	**Software:**	**Hardware:**	**Operating Systems:**
4yrs: C/C++	2yrs: OpenCV	3yrs: VIM	5yrs: Arduino	10yrs: Windows
2yrs: Python	1yr: Affdex	2yrs: Visual Studio	3yrs: Raspberry Pi	4yrs: Linux (Ubuntu)
2yrs: Matlab	1yr: Boost	2yrs: VirtualBox	1yr: NI cRIO	
2yrs: Java	1mo: Curl	1yr: PSoC Creator	1yr: Cypress PSoC5	
2yrs: HTML	1mo: PyLepton	1yr: Xilinx Suite	1yr: Xilinx FPGA	
2yrs: CSS	1mo: Google Maps	1yr: GTK Wave	1yr: Oculus Rift	
1yr: LabVIEW		1yr: Yosys	2mo: Leep Motion	
1yr: UnrealScript		2mo: Unreal Engine	2mo: Myo Armband	
		2mo: UDK		