John Allard Jr. | Curriculum Vitae

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Education

University of California, Santa Cruz — **B.S. Computer Science**
Junior, Graduation in June, 2016. 3.63 GPA — *2014 - Pres.*

Glendale Community College — **Computer Science, Physics**
Lower-Division Requirements, 3.75 GPA — *2011 - 2014*

Work Experience

Research

Harvey Mudd College — **Computer Science Department**
REU Intern — *6/14 - 9/14*
Helped develop software to localize an actor in an environment using 3D models, statistical techniques, and computer-vision algorithms.
Details :
- Create a detailed model of a three dimensional space using a 3D imaging camera.
- Parse the 3D model to create a large database of image-feature data.
- Use CV techniques to compare an image from a place in the environment with the database of image-feature data.
- Use the Monte Carlo Localization algorithm to iteratively improve our guess on the actor's location in the environment.

Mentor	Professor Zachary Dodds
Repository	`https://github.com/jhallard/3DLocalization`
Website	`jhallard.github.io/3DLocalization`

Jet Propulsion Laboratories — **Human-Robot Interfaces Laboratory**
Intern — *9/13 - 1/14*
Worked on a few topics related to human-computer interfaces, including bioelectric-signal processing and speech recognition.
Details :
- Helped develop an Android application that interfaces with bioelectric-sensing equipment. This app would connect to various sensors via BlueTooth, once connected the user could obtain information on electrical signals in their muscles, electric resistance of their skin, or their heart rate.
- Worked on a speech-recognition program that relayed voice commands to a quadcopter over the internet. Our program was built on-top of the Sphynx speech recognition libraries, and allowed a user to send a basic set of commands to a quadcopter by speaking into their computer.

Mentor	Dr. Adrian Stoica
Repostory #1	`https://github.com/jhallard/BioSig-for-Android`
Repostory #2	`https://github.com/jhallard/QuadCopter-Voice-Commands`

Employment

Self Employed — **Greater Los Angeles Area**
Tutor of Mathematics, Physics, and Computer Science — *12/11 - 6/14*
Shortly after becoming a tutor for Glendale College, I began to tutor privately for various clients in the Los Angeles area. The subjects I tutored ranged from pre-Algebra to Differential Equations, the C, C++, and Java programming languages, and any of the lower-division physics courses.

Glendale Community College — **Departments of Physics, Mathematics**
Supplementary Instruction Tutor — *9/11 - 9/13*
I was employed as an S.I. tutor for the physics and mathematics departments at Glendale Community College. It was my responsibility to orchestrate supplementary tutoring sessions for specific classes. During these sessions I would solve example problems for the class as well as help individuals with the material.

Personal Projects

PadSync — **8/14 - Pres.**
A Computing Network for Simple Home Customization. — *Currently In Development*
PadSync is a home computing network that provides a simple, intuitive, and consistent interface for controlling the various electronic devices around a user's living area. This is accomplished by developing a connected system of hardware and software that allows the user to control their electronic devices wirelessly from their smart-phone, laptop, or desktop computer. This project is currently transitioning from planning to prototyping stage, and has been a single-man project thus far. The repository is currently private, if you wish to view it please email me and I can give you temporary permission rights to view the source code.
- Website : `jhallard.github.io/PadSync`
- Repository : `https://github.com/jhallard/PadSync` (currently private)

DataStructures **11/14 - Pres.**

A Collection of Data Structures, Implemented in C++ *Currently In Development*

This project contains a grouping of templated implementations for some of the more common data structures. This includes stacks, queues, heaps, trees, maps, and graphs.

- Repository : `https://github.com/jhallard/DataStructures`

Tutr for Android **1/14 - Pres.**

Connecting Students to the Help They Need. *Currently In Development*

Tutr is an Android app that uses GPS coordinates and a host of other factors to match students to the tutors they need. It was started during the UCSC Hackathon by myself and some friends and has since become a personal project of mine.

- Repository : `https://github.com/jhallard/tutr`

CVFeatureFinder **7/14 - 8/14**

Performs Feature Detection, Description, and Matching Between Image Frames. *Almost Completed*

This project utilizes the Open Computer Vision (OpenCV) libraries to perform comparisons between sets of images. The user can either compare two sets of images, a set of images with a video-feed, or two video-feeds with eachother, where a video-feed is parsed frame-by-frame for image data. Once the image features are detected and matched, the program visually displays the feature matches to the user, and outputs a score to the user stating the similarity of the two images.

- Repository : `https://github.com/jhallard/CVFeatureFinder`

PointCloudProcessor **6/14 - 8/14**

Simplifies the Creation and Processing of PointClouds using a Kinect Camera. *Work Postponed for Now*

This project streamlined the task of reading data from a Kinect camera and using it to build a 3D point-cloud object representing the space around the camera in real time. This allows a user to then perform calculations and transformations on a live 3D model of their space. Work on this project is currently postponed as I have since found more efficient means of working with 3D models than PointClouds.

- Repository : `https://github.com/jhallard/PointCloudProcessor`

PhySim **4/13 - 6/13**

Simulates Physical Phenomena Encountered in a College-Level Physics Course. *Work Postponed for Now*

This was a project that I worked on when I was still a physics major. The goal of the project was to allow a user to simulate a wide-array of intersting phenomena encountered in an undergraduate-level physics course. This included simulating wave interactions, plotting the trajectories of objects under the effects of air friction, and simulating various chaotic systems including the famous double pendulum.

- Repository : `https://github.com/jhallard/PhySim`

Presentations

Computer Vision Based Monte Carlo Localization in Three Dimensions **8/15/14**

Harvey Mudd College *John Allard Jr, Alex Rich*

Simulating the Motion of a Double Pendulum **4/17/14**

Glendale Community College *John Allard Jr*

Bioelectric Signal Processing with Shimmer Devices and Android **1/10/14**

Jet Propulsion Laboratories *John Allard Jr, Jose Figueroa*

Computer Skills

Advanced: C++, C, LaTeX, UNIX, GIT, ARDUINO, RASPBERRY PI

Intermediate: OPENCV, OPENGL, BOOST, MATLAB, ANDROID, POINT CLOUD LIBRARY, PYTHON, JAVA, EXCEL

Basic: PHP, JAVASCRIPT, HTML