Alvin T. Vuong

alvin.t.vuong@ucla.edu | +1 (925) 470-7297 | imatv.me | github.com/Alvin-Vuong

Education

University of California - Los Angeles **(expected) 2013 - 2017**

B.S. in Computer Science - Minor in Cognitive Science

GPA: 3.367

Relevant Coursework: * = In Progress

- Intro to Computer Science (CS 31 & 32)
- Intro to Computer Organization (CS 33)
- Software Construction Laboratory (CS 35L)
- Operating Systems (CS 111)
- Programming Languages (CS 131)
- Computational Genetics (CM 124)
- Fundamentals of Artificial Intelligence (CS 161)
- Intro to Cognitive Science (Psych 85)
- Cognitive Psychology (Psych 120A)
- Sensation and Perception (Psych 120B)
- Neuroethics (Psych 188A)
- * Intro to Data Mining (CS 145)
- Algorithms & Complexity (CS 180)
- Formal Languages and Automata Theory (CS 181)
- Logic Design of Digital Systems (CS M51A)
- Digital Design Laboratory (CS M152A)
- Linear Algebra & Discrete Structures (Math 33A & 61)
- Intro to Probability (Stats 100A)
- Advanced Game Development for Virtual Reality (CS 188)
- Intro to Linguistic Analysis (Ling 20)
- Intro to Phonetics (Ling 103)
- * Phonology (Ling 120A)
- * Syntax (Ling 120B)
- * Mathematical Modeling & Methods (CS 170A)

Extracurricular Activities:

- UCLA Archery Team | UCLA CS:GO Gold Team
- UCLA Association of Computing Machinery – AI & VR/CG
- UCLA Cognitive Science Student Association

Coursera.org / edX.org / Udacity.com

- Machine Learning – w/ Andrew Ng at Stanford University (Sept. 2014)
- The Science of Everyday Thinking – UQx – Think101x (Dec. 2015)
- * Descriptive & Inferential Statistics (July 2016)

Deer Valley High School **2009 – 2013**

High School Diploma – Class Valedictorian

GPA: 4.522

Honors & Awards:

- Platinum Renaissance (Honor Roll GPA 4.0+) 2009 - 2013
- AP Scholar with Distinction
- CSF Lifetime Member Award
- Key Club Scholarship Recipient ($1,000)
- DVHS Male Student Athlete Scholarship Recipient ($2,500)

Activities & Societies:

- Academic Challenge and Enrichment (ACE) Academy
  - Computer Science Major
- California Scholarship Federation - Treasurer
- National Honors Society - Founding Treasurer
- Key Club International
- DVHS Varsity Tennis & Junior Varsity Baseball

Experience

UCLA Computational Perceptual Processing Lab | Research Assistant **June 2016 –**

zililab.psych.ucla.edu

Computational Motion Processing & Learning **June 2016 –**

- Working with Yang (Mac) Xing under Dr. Zili Liu on using SVM techniques to extract any perceptual information from the middle temporal (MT) area as compared to V1, even under MT suppression and after perceptual learning.
- I assist in writing Matlab scripts for fMRI data analysis and organization.

Environmental Vertical Illusion in Virtual Reality **June 2016 –**

- Working with Chéla Willey on investigating the oculovestibular perception of virtually tilted rooms. Tilted/skewed contexts affect human perception of their subjective vertical, resulting in environmental illusions.
- I help create the experimental virtual environments and their functionalities in Unity.

UCLA Rissman Memory Lab | Research Assistant — June 2015 –

rissmanlab.psych.ucla.edu

Neural Correlates of Fluid Intelligence & Depression using the Human Connectome Project — **June 2015 –**

- Working with Nicco Reggente under Dr. Jesse Rissman on using functional magnetic resonance imaging (fMRI) and diffusion tensor imaging (DTI) data from the Human Connectome Project (HCP) to account for individual differences in fluid intelligence, memory strength, and reward.
- Currently writing Matlab and shell scripts to train predictive models using many subjects' data and assessing the relationships to their behavioral scores on various NIH Toolbox tasks, such as the PMAT.

Avatar Learning in Virtual Environments — **Jan. 2016 –**

- Working under Joey Essoe and Nicco Reggente on investigating the cognitive and neural mechanisms of learning and memory that occurs within virtual reality and their implications for future training and educational purposes.
- Currently MRI safety certified and CITI-trained (basic, social/behavioral, HIPAA), I assist in the process of running and scoring participants, as well as maintaining data quality assurance.

Unity3D / UCLA Real Time Lab | Research Assistant & Consultant — June – July 2016

Virtual Reality Guided Narrative Techniques

- As collaboration between Unity3D and the UCLA Real Time Lab, I worked under Dr. Diana Ford on exploring algorithmic techniques in creating guided experiences in VR.
- Specifically, I worked on using a C# wrapper of the Fast Artificial Neural Network (FANN) Library as a plugin to the Unity game engine in order to activate predictive cues that would grab the player's attention. The NN was trained on a variety of data from the scene, including player camera angle and focal point position.
- Presented our final VR guided narrative demo, *Busking for Change*, at SIGGRAPH 2016, a conference on computer graphics and interactive techniques.

USA Archery | Electronic Scoring Team — June – July 2014-16

- Prepared and helped manage electronic scoring systems for two USA Archery tournaments: SoCal Showdown & U.S. National Target Championships/Easton JOAD Nationals.
- Shadowed the use of Ianseo and Rcherz, two archery scoring database systems (SQL-based) that contained the scoring data of archers at the competitions.

Conference Presentations

Ford, D., Lindberg, T., Mirand, A., Gorczycki, H., **Vuong, A. T.**, Cam, C., Waz, A., Herndon, M. (2016). ***Essential Algorithms for Creating Guided Narrative VR Experiences***. VR guided narrative demo, *Busking for Change*, presented at SIGGRAPH, Anaheim, CA.

Vuong, A. T., Reggente, N., Rissman, J. (2016). ***Neural Correlates of Fluid Intelligence via Functional and Structural Network Connectivity Measures.*** Poster presented at UCLA Psychology Undergraduate Research Conference, Los Angeles, CA.

Ohno, A. A., Baek, H. Y., Mehta, P. S., Yu Villa, J., Hughes, G. M., Ekanayake, R., Sanchez-Prak, A., **Vuong, A. T.**, Shiboski, H., Reggente, R., Essoe, J. K.-Y., Rissman, J. (2016). ***Does Presence/Immersion Confer an Advantage in Learning in Virtual Reality?*** Poster presented at Stanford Undergraduate Psychology Conference, Stanford, CA and UCLA Undergraduate Research Week, Los Angeles, CA. Recipient of the URW Outstanding Poster Award.

Vuong, A. T., Aniwar, D., Carney, J. (2013). ***USB Attack and Defense*****.** Poster presented at Contra Costa Science and Engineering Fair, Antioch, CA. 2nd Place.

Vuong, A. T., Aniwar, D., Carney, J. (2012). ***Derivations from Basic Quantum Principles*****.** Poster presented at Contra Costa Science and Engineering Fair, Antioch, CA. 2nd Place, Mu Alpha Theta Award.

Talks

Vuong, A. T. ***The Future of VR/AR: A Hacker's Perspective.*** (April 23, 2016) Talk presented at University of California, Los Angeles. 3rd Annual Cognitive Science Conference: The Future of Virtual & Augmented Reality: Mind, Medicine, & Media.

Vuong, A. T., Rotman, J.N. ***CS is Cool: Technology & Problem Solving.*** (March 24, 2016) Talk presented at Deer Valley High School Robotics and Physics Classes, Antioch, CA.

Vuong, A. T., Harte, E.M. ***CS is Cool: A Hacker's Life Beyond High School*****.** (March 27, 2015) Talk presented at Deer Valley High School ACE Academy, Antioch, CA.

Projects

DodgeLodge **Apr. 2016**

devpost.com/software/dodgelodge

- Full-body virtual reality dodging game, built using Unity, a Microsoft Kinect V2, an Oculus Rift, and a Leap Motion.
- Used the Unity Leap Motion API to extract directional finger pointing data for use in projectile firing.
- Assisted in using the Unity Kinect API to map player's joint and skeletal orientation to an in-game model.
- Unity game logic and design for demo showcase.
- Top Ten Hack, at LA Hacks 2016, hosted at UCLA.

WalkVR **Oct. 2015**

devpost.com/software/m-o-l-m

- Walking virtual reality experience, built using Unreal Engine 4, a Myo Armband, an Oculus Rift, and a Leap Motion.
- Implemented a workaround for leg movement and body orientation in Lua using the Myo SDK to trigger in-game movement based on acceleration and gyroscopic data.
- Map creation and Blueprint scripting using UE4 to create a demo game world for project showcase.

ObjectRekt **June 2015**

devpost.com/software/object-rect

- Automated thermal tracking camera powered by OpenCV object recognition and the FLIR Lepton, a longwave infrared thermal imager, mounted on a dual-axis rotating servo system, connected to a Raspberry Pi.
- Observes the scene and tracks a presenter's location, panning to the proper locations.
- Attempted to incorporate "smart recording," where camera will pan to areas suggested by the presenter's gestures and actions (i.e. pointing to the projection, pan to slide).
- Oversaw the onboard Raspberry Pi implementation of the algorithms used for servo control and quick thermal tracking.

Playlist2000 **Jan. 2015**

devpost.com/software/playlist2000

- Voice-controlled music queuing interface, built using Windows Speech Recognition, Vocola, and Python.
- Created Vocola voice instructions used to interact with a Python programming interface in order to queue Windows batch scripts that would then play songs in a specified order.

EmoCar **Oct. 2014**

devpost.com/software/emocar

- Mind-controlled Arduino-based rover controlled by an Emotiv EPOC EEG neuroheadset.
- Handled the decryption and visualization of the headset data using Emokit, an open-source driver for raw data access, and Pygame.
- Set up a simple brain-computer interface in Python for interpreting brain signals as robotic motor functions.
- Winner of MuleSoft's Most Connected Hack at Cal Hacks 2014, hosted at UC Berkeley.

Hartbeat **Sept. 2014**

devpost.com/software/hartbeat

- Heart rate-based First Person Shooter built using Unreal Development Kit and an Arduino optical heart rate sensor.
- Wrote UnrealScript that varied the bullet spread in-game based on the player's heart rate.
- Utilized Flash ActionScript to dynamically alter the Heads-Up Display accordingly.
- Map creation using UDK to test spread dynamics and other various functionalities (player movement, etc.).

FindAR **Aug. 2014**

devpost.com/software/findar

- Augmented reality application using an Oculus Rift, a webcam, and OpenCV to facilitate real-world search (visual filters & face/object recognition).
- Developed an API in C++ for handing web socket input to control the application using a Pebble Smartwatch.
- Used OpenCV library to handle webcam feed and applied color isolation filters to ease search for lost objects.
- Awarded First Place & Top Oculus Hack at Hero Hacks, a wearable technology hackathon. Devpost Staff Pick.

TripleXArchery **July 2014**

triplexarchery.herokuapp.com | devpost.com/software/triplexarchery

- Digital notebook allowing archers to store their scores online in one, impossible-to-lose place.
- Implemented the back-end PostgreSQL database management interface to store users' scores.
- Used the Java Play Framework to weave the web application together.