Alvin T. Vuong

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Education

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

B.S. Computer Science - Minor in Cognitive Science GPA: 3.38

Relevant Coursework: * = In Progress

- Operating Systems (CS 111)
- Software Construction Laboratory (CS 35L)
- Programming Languages (CS 131)
- Data Mining (CS 145)
- Computational Genetics (CM 124)
- Artificial Intelligence (CS 161)
- Cognitive Psychology (Psych 120A)
- Sensation and Perception (Psych 120B)
- Neuroethics (Psych 188A)
- Neural Networks (Psych 186B)
- Engineering Ethics (Engr 183EW)
- Entrepreneurship (Engr 112)
- Product Strategy (Engr 113)
- Algorithms & Complexity (CS 180)
- Logic Design of Digital Systems (CS M51A)
- Digital Design Laboratory (CS M152A)
- Computer Systems Architecture (CS M151B)
- Linear Algebra & Discrete Structures (Math 33A & 61)
- Mathematical Modeling & Methods (CS 170A)
- Formal Languages and Automata Theory (CS 181)
- Advanced Game Development for Virtual Reality (CS 188)
- Linguistic Analysis (Ling 20)
- Phonetics (Ling 103)
- Phonology (Ling 120A)
- Experimental Phonetics (Ling 104)
- * Computer Networks (CS 118)

Extracurricular Activities:

- UCLA Archery | MentorSEAS | ACM – AI & VR/CG | Cog. Sci. Student Assoc.| Hacker Fund

Coursera.org / edX.org

- Machine Learning – w/ Andrew Ng at Stanford University (Sept 2014)
- The Science of Everyday Thinking – UQx – Think101x (Dec 2015)

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

Escality Games | *Founder & Lead Developer* **Aug 2016 –**

- Managing the development of a VR escape room game.
- Using the HTC Vive and Unity VRTK SteamVR C# plugin for Unity to manage Vive input and functionality.

UCLA Computational Perceptual Processing Lab | *Research Assistant* **June 2016 – May 2017**

zililab.psych.ucla.edu | Dr. Zili Liu

Computational Motion Processing & Learning **June 2016 – Jan 2017**

- Writing Matlab analyses for MT-V1 task-state fMRI data to better understand motion processing and perceptual learning using support vector machines.

Environmental Vertical Illusion in Virtual Reality **June 2016 – May 2017**

- Developed a VR experiment in Unity to investigate the oculovestibular perception of virtually tilted rooms.
- Tilted/skewed contexts affect human perception of their subjective vertical, resulting in environmental illusions.

UCLA Rissman Memory Lab | *Research Assistant* **June 2015 – May 2017**

rissmanlab.psych.ucla.edu | Dr. Jesse Rissman

Neural Correlates of Behavioral Measures via the Human Connectome Project **June 2015 – Jan 2017**

- Wrote Matlab and Shell scripts to train predictive models using many subjects' fMRI and DTI data from the Human Connectome Project to account for individual differences in behavioral scores, such as fluid intelligence, memory strength, and reward.

Avatar Learning in Virtual Environments **Jan 2016 – May 2017**

- MRI safety certified and CITI-trained (basic, social/behavioral, HIPAA), running and maintaining participant data.
- Investigating the cognitive and neural mechanisms of learning and memory that occurs within virtual reality and their implications for future training and educational purposes.

The Coding School | *Instructor* **Sept – Dec 2016**

the-cs.org

- Worked for a non-profit educational program that teaches computer science to K-8 students.
- Taught basic Unity 3D game development at John Adams Middle School.

Unity Technologies | *Research Consultant* **June – Aug 2016**

edu.unity3d.com/siggraph2016/theater | Dr. Diana Ford

Virtual Reality Guided Narrative Techniques

- Project exploring algorithmic techniques for guided VR experiences.
- Used 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.
- Presented our final VR guided narrative demo, *Busking for Change*, at SIGGRAPH Anaheim, a conference on computer graphics and interactive techniques.

USA Archery | *Electronic Scoring Team* **June – Aug 2014-17**

teamusa.org/USA-Archery

- 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 that contained the scoring data of archers at the competitions.

Conference Posters & Demos

Baek, H. Y., Ohno, A. A., **Vuong, A. T.**, Essoe, J. K.-Y., Reggente, N., Rissman, J. (2017)., ***Individual Differences in Spatial Memory Abilities Predict the Efficacy of The Method of Loci Mnemonic Technique*.** Abstract accepted for poster presentation at UCLA Psychology Undergraduate Research Conference, Los Angeles, CA.

Ohno, A. A., **Vuong, A. T.**, Baek, H. Y., Essoe, J. K.-Y., Reggente, N., Rissman, J. (2017). ***Enhancing Memory with the Method of Loci using Virtual Memory Palaces*.** Abstract accepted for poster presentation at UCLA Undergraduate Research Week, Los Angeles, CA.

Essoe, J. K.-Y., Reggente, N., Baek, Y. H., Ohno, A. A., Mehta, P., **Vuong, A. T.**, & Rissman, J. (2017). ***Long-term retention of vocabulary in two phonetically similar foreign languages is aided when learning occurs in highly distinctive virtual reality environments.*** Poster presented at the Cognitive Neuroscience Society annual meeting, San Francisco, CA.

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

Essoe, J. K.-Y., Reggente, N., Baek, H. Y., Ohno, A. A., Mehta, P., **Vuong, A.** T., & Rissman, J. ***Making VR learning "stick": contextually supported transfer and long-term retention.*** (April 18, 2017) In K. Bullock & B. Kateb (Chairs), Virtual reality clinical neuroscience. Symposium conducted at the Society for Brain Mapping & Therapeutics (SBMT) Annual World Congress, Los Angeles, CA.

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 Kinect API to map player's joint and skeletal orientation to an in-game model.
- Used the Unity Leap Motion API to extract directional finger pointing data for projectile firing.
- Top Ten Hack, at LA Hacks 2016, hosted at UCLA.

Malfunction — Sept – Dec 2015

https://www.youtube.com/playlist?list=PLE1RS8CnGpbRAskCFP2_amaVh-hU5Nrvk

- VR puzzle game prototype using the Leap Motion and Oculus Rift in Unreal Engine 4.
- Design of novel game mechanics using the Leap Motion to solve brain teaser puzzles and to disarm an enemy robot.
- Presented in a class project showcase alongside other experimental VR game experiences.

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.
- Used Myo's Lua SDK to trigger artificial walking based on leg acceleration and gyroscopic data.

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.
- 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 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 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.