

## WORK EXPERIENCE

### Research Associate & Lead Software Engineer

*Dec 2015–Present*

UCLA VR Lab - UCLA Health Psychiatry and Neurosurgery Department

- Conceptualize, troubleshoot, and optimize novel applications for mobile and tethered VR, AR, and 3D experiences using Unity C#
  - Develop apps around patient comfort and accurate data gathering for memory-based tasks
  - Prioritize efficiency of apps to educate different audiences
  - Streamline needs for medical-based image viewing and analysis
- Implement tools such as eye tracking, Occipital Structure Sensor, 360 cameras, and a variety of bluetooth controllers
- Engineer network systems between a mobile phone and desktop computer to share and sync data
  - Utilize OptiTrack cameras and NatNet SDK to allow for an unwired, real-time motion tracked VR experience
  - Utilize the Unity UNet library to mirror an unwired VR experience to a desktop for multi-player apps
- Model, rig, and animate digital 3D environments, people, and objects in Autodesk Maya
  - Semi-automate 3D modeling workflow utilizing Python libraries (OpenCV, PyQt, MEL in Maya) for computer vision and machine learning algorithms to transform MRI images into 3D models
  - Scan and manipulate 3D human models using blend shape technique in Maya and Unity
- Design and launch websites with WebGL-based inserts
- Created video tutorials to streamline the training process for undergraduate assistants
- Generate and manage databases of digital animations, 3D images, and user feedback
- Process and analyze different data sets including 3D medical images, electrophysiology signals, and behavioral information using Python and Matlab, including their linear algebra libraries
- Proficient in multiple languages: C# Unity, C++ Visual Studio, HTML/JavaScript/CSS, Python, Maya MEL/Python, bash
- Develop for Samsung Gear VR, HTC Vive, Hololens, iPad, Desktop and more

## PERSONAL PROJECTS

- Integrate Occipital's Structure Sensor camera into an augmented reality role-playing game using Unity in one month
  - Efficiently design a store, inventory, and character statistics system
  - Utilize Unity's Navigation system for Enemy AI
  - Design 2D GUI and 3D graphics with player ease of use in mind
- Code and write storyline of an interactive visual novel in one week using RenPy Engine
  - Integrate native Python scripting for interactive games
  - Design 2D graphics of all characters and objects
- Create a low budget workflow for combining separately recorded face and body motion capture
  - Use MatchMover and Maya to create animated rigs and bake it into reduced 3D scans of people
  - Design the process to allow combining different gestures and reactions to create a database
  - Import into Unity's blend tree system to allow control during specific events
- Personal web portfolio
  - Post tutorials of my work to allow others to learn and discuss
  - Write reviews of my VR-related and other experiences to document my progress

## ADDITIONAL SKILLS

- Collaborate well with external groups to achieve proper funding for their new endeavors
- Effectively communicate concepts and techniques to assistants to allow them to confidently work autonomously
- Efficiently organize and document all stages of a project to allow easy transfer of responsibilities and reproducibility
- Independently handle tasks and research solutions when necessary
- Author content for IRBs, grants, journals, and presentations with effective communication

## EDUCATION

University of California, Los Angeles **B.S. Neuroscience**

*June 2016*

## JOURNAL AND CONFERENCE PUBLICATIONS

Aghajan, Z et al. "Theta dynamics in the human medial temporal lobe during freely moving spatial navigation". Neural Microcircuits Training Program Symposium & International Conference on Learning & Memory. 2018.  
Villaroman, D et al. "Medical Consultation of Spinal Pathologies with Kinematics in Virtual Reality". Global Spine Congress. 2018.  
Villaroman, D et al. "A Kinematic Model of Spinal Anatomy in Virtual Reality for Patient and Physician Education". AANS. 2017.  
Gaonkar, B et al. "Multi-Parameter Ensemble Learning for Automated Vertebral Body Segmentation in Heterogeneously Acquired Clinical MR Images". IEEE J Transl Eng Heal Med. 2017.