Samir Ghosh

mail@samir.tech www.samir.tech

Directs and codes impactful VR and AR projects for a USC makerspace with an interdisciplinary set of faculty

Education

B.S. Computational Linguistics USC '18
Deep learning for syntax models, speech detection, speech synthesis, and forensic linguistics

B.A. Cognitive Science USC '19
Cognitive neuroscience of visual, haptic, and olfactory processing
Neurological effects of meditation and mindfulness practices

Experience

Assistant Director, USC Harman Academy for Polymathic Study **Jan 2019 - Present**
The Ahmanson Lab provides a makerspace facility and produces projects with 3D printers, microcontrollers, and XR resources

- ***Notable VR/AR projects***:
  - Stanza Del Segnatura: Annotated reconstruction of the Raphael Rooms developed in Unity alongside art historian faculty (collab. Vatican, $100k NEH grant)
  - Livewire: WebGL-based particle simulations and scientific visualizations of live brainwave data with OpenBCI and Muse EEG headsets. Created an international competition for students to submit speculative VR, generative art, and game design ideas for BCI games.
  - Terraforming Mars: Virtual Mars environment that displays in-game slide presentations of student research on terraforming using Unity (collab. NASA JPL, Calif. Science Center)
  - Virtual Gallery *(current)*: Tool that allows users to customize a virtual gallery space. Prototypes in Unity, Three.js, Mozilla Hubs
  - Booksnake *(current)*: Retrieves rare archival material such as 19th century maps and renders in AR for researchers using ARKit (collab. Library of Congress)
- Teaches a hands-on workshop series spanning deep learning, VR and AR development, computer graphics, robotics, 3D printing, and issues in privacy rights and AI
- Maintains makerspace fabrication resources for students and professors (weekly usage 100 to 250 people in 2019)

DevOps Engineering Intern, Intel Corporation **Summer '16, Summer '18, Fall '18**
My division managed and used massive server farms and supercomputers for in-house computing

- Implemented a scalable, real-time cybersecurity threat responder and visualization system using OSSEC, Wazuh and Elasticsearch (200k+ machines monitored per instance)
- Created a data pipeline for machine learning projects to augment server farm performance using Python
- Extended a hardware agnostic firmware service tool from CLI to a web interface using Node.js and various front-end frameworks
- Created real-time visualizations of server availability and update status during scheduled server farm downtime using Kibana and Python scripting

Software Assistant for Behnaz Farahi **Aug 2016 - Dec 2017**
Behnaz Farahi produces internationally acclaimed fashion pieces, integrating cutting edge wearable technology

- Designed computationally efficient microcontroller software to integrate various sensor data with lights, pneumatics, and motor driven systems concealed in 3D-printed dresses using Arduino
- Repaired electronics and modified code under time pressure at exhibitions, runway shows, and film shoots
- Communicated technical information to electrical and mechanical engineers, models, and production crews

Co-founder, clevergrads.com **Dec 2016 - July 2017**
This profitable student-run small business sold affordable gowns, sashes, and other graduation accessories

- Researched, analyzed, and exploited competitors' supply chain and marketing strategies
- Conducted and rapidly iterated on multi-language print and social media marketing campaigns (5k reach)
- Designed and worked in order packaging, delivery, sales and inventory management

Research Assistant, USC Brain and Creativity Institute **Mar 2015 - Aug 2015**

The USC Brain and Creativity Institute pushes the forefront of neuroscience research

- Filtered and cleaned EEG data for meditation and states of consciousness studies
- Helped design EEG experiments to assess a subject's visual acuity, object recognition, and self-name responses

QA Intern, Enlighted Inc. **Summer '14**

Enlighted makes intelligent light systems for commercial buildings

- Built and designed test rigs for infrared sensors to verify output voltages
- Designed and implemented tools and processes to re-solder mass quantities of faulty units

Skillsets

VR development for Valve Index, Oculus Rift, and Oculus Quest (Proficient, uses often)

- Unity (C#)
- Three.js/WebGL
- Blender

AR development for iOS (Basic, uses monthly, reviews code bi-weekly)

- ARKit

Web development (Proficient, uses often)

- HTML/CSS/JS (Vue.js is my favorite front-end framework)
- Node.js
- API endpoint testing and analysis
- Rust (currently learning in the context of WASM compilation to accelerate 3D web applications)

Scientific and ML (particular experience for audio processing and linguistics research)

- Python
- Keras, Tensorflow (Will need to brush up, but used these in graduate level linguistics classes and research; I teach basic techniques with these every semester)

Generative Art/Graphics

- p5.js / Processing
- Shader code (WebGL preferred)

Hardware Prototyping (usually in the context of wearable technology or robotics)

- Arduino
- Raspberry Pi
- CAD (Autodesk Inventor)
- Metal manufacturing (CNC and Lathe for sheet metal construction)
- 3D printing
- Low pressure pneumatic systems