apurv@ucsb.edu

Apurv Varshney

LinkedIn
apurvvarshney.github.io

Interests: Human Computer Interaction (HCI) and Computer Vision

Education

M.S. in Computer Science, University of California Santa Barbara (UCSB), GPA: 3.94/4.00 — **Jan 2021 — Dec 2022***

B.Tech in Computer Science and Engineering, Indian Institute of Technology (IIT) Goa — **Aug 2016 — July 2020**

Relevant Projects

Graph Approaches for Adaptive AR — **Spring 2022**

- Problem: Assigning objects of a virtual scene to new positions in an arbitrary real-world location.
- Compared how purely geometrical algorithms and Graph ML techniques perform on this problem

Evaluation of Subretinal Prosthetic Implant (PRIMA) Simulation for Visual Acuity — **Fall 2021**

- Aim: To evaluate the visual acuity that can be acheived by PRIMA prosthetic implant
- Built a gaze-contingent VR experiment to simulate PRIMA prosthesis
- Developed using HTC Vive Pro Headset, Unity and pulse2percept

Flick Gesture Interaction in Augmented Reality: AR Carrom — **Spring 2021**

- Built an AR app with a flick gesture mechanic that utilizes hand gestures and doesn't rely on any external hardware
- Developed using Unity, ARCore and Manomotion

Performance Analysis and Optimization on Edge AI devices — **Spring 2021**

- Aim: To study Optimization Techniques to increase inference performance on Edge devices
- Studied Nvidia's Nsight profiling tool and compared performance of basic AI models using TensorRT on Jetson Nano

Facial Emotion Recognition — **Winter 2021**

- Aim: Given an image, identify the emotion expressed within the image
- Compared the performance of different classifiers (SVM, CNN, GAN) and dimensionality reduction techniques (PCA, AutoEncoders (AE), Convolutional AE) on FER 2013 dataset
- Implemented a Super Resolution model using AEs to study the effects of super resolution images on classification task

Cancer subtype detection using Human Gene Expression data — **Jan 2020 — Jul 2020**

- Bachelor's Project, Advisor: Dr. Clint P. George
- Aim: Clustering and detection of different cancer types using the Gene Expression data through Unsupervised Clustering & dimensionality reduction techniques to help in diagnostic and to reveal possible previously unknown cancer subtypes.
- Optimized Autoencoder model for Breast Cancer Data using Keras API

Relevant Experience

Graduate Student Researcher, Bionic Vision Lab — **Fall 2021 — present**

- Developing AR/VR systems to simulate prosthetic vision to help solve blindness and low vision.
- Developing High Stress VR Environments to study strategy shift performance

Teaching Assistant — **Fall 2021 — present**

- CS 64 (Computer Organization and Digital Logic Design), CS 16 (Problem Solving with Computers), CS 160 (Translation of Programming Languages), CS 8 (Introduction to Computer Science)

Data Science Intern, eClerx Services Mumbai — **May 2019 — Jul 2019**

- Built a model to extract Trending Financial News from data collected by scraping news websites using Natural Language Processing & Topic Modelling techniques from spaCy
- Developed an OCR model for Passports Using TensorFlow to help the HR department get rid of doing manual entries
- Used SAS Enterprise Miner for Data Analysis
- Automated Dummy Test Data Generation for financial data of banks (generally private)

Publications

1. Varshney, A. *et al. Flick Gesture Interaction in Augmented Reality: AR Carrom* in *The Adjunct Publication of the 34th Annual ACM Symposium on User Interface Software and Technology* (2021). https://doi.org/10.1145/3474349.3480229.