

# Dharanya Vanchinathan

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## EDUCATION

### University of Southern California

*M.S in Electrical Engineering*

Los Angeles, CA

Aug 2021 – Dec 2022

- **Concentration:** Signal and Image Processing
- **Coursework:** Machine Learning(EE559), Digital Signal Processing(EE483), Probability for Electrical Engineers(EE503), Linear Algebra(EE510)

### National Institute of Technology

*B.Tech in Electronics and Communication Engineering with minor in Computer Science*

Tiruchirappalli, India

July 2016 – May 2020

## EXPERIENCE

### Research Intern

*Shantou University*

May 2019 – July 2019

*Shantou, Guangdong, China*

- Built a standalone application in **Python** using **PyQt5**, **VTK** for visualizing Automated Breast Ultrasound DICOM files in 3D to embed in SIUI instruments for the detection of lesions.
- Built an application **MATLAB GUI** that detects vortexes formed due to blood flow in the left ventricle of the heart, for the clinicians to evaluate the functioning of a patient's heart in real-time. A technique called Vector Flow Mapping is used which draws streamlines over the Doppler Echocardiography Images to detect vortexes.

## PROJECTS

### Intracranial Vessel Wall MRI Image Reconstruction | *Deep Learning, Image Processing*

- Developed a Generative Adversarial Network **GAN** with attention modules using **Tensorflow** for better contrast enhancement of the MRI precontrast images in order to speed up the MRI scanning process.

### Brain Tumor Visualization | *Image Processing, Volume Rendering*

- Built an application using **VTK** in **Python** that renders 2D MRI Brain Slices into an interactive 3D model and segments the region of brain tumour in the 3D model.

### Facial Expression Recognition | *Deep Learning, Image Processing*

- Developed a novel Auxiliary Classifier Generative Adversarial Network (**ACGAN**) based model that recognizes ten different Facial Expressions with better accuracy.

### Self Interference Cancellation | *Wireless Communication, Machine Learning*

- Developed a model using **Tensorflow** to eliminate self-interference, which arises due to the presence of both transmitters and receivers in close proximity, in Full-Duplex Radios, for 5G Wireless Technology, with the help of Neural Networks.

### Classification of Macular Edema | *Image Processing*

- Employed a Super-pixel based approach for classifying different types of Macular Edema in Optical Coherence Tomography (OCT) images using Histogram of Oriented Gradients(HOG) descriptor.

## TECHNICAL SKILLS

**Languages:** Python, C/C++, SQL, MongoDB, JavaScript, HTML/CSS

**Frameworks/Libraries:** NumPy, Matplotlib, Tensorflow, PyTorch, OpenCV, Node.js, Flask, Pandas, VTK

**Developer Tools:** Git, Google Cloud Platform, MATLAB

## PUBLICATIONS / JOURNALS

**Facial Expression Recognition through person-wise regeneration of expressions using Auxiliary Classifier Generative Adversarial Network (AC-GAN) based model** — Journal of Visual Communication and Image Representation, Elsevier (May 2021)  
<https://doi.org/10.1016/j.jvcir.2021.103110>

**Novel Method of Self-interference Cancellation in Full-Duplex Radios for 5G Wireless Technology Using Neural Networks**—Conference on Machine Learning, Deep Learning and Computational Intelligence for Wireless Communication (MDCWC 2020), Springer (April 2021)  
[https://doi.org/10.1007/978-981-16-0289-4\\_5](https://doi.org/10.1007/978-981-16-0289-4_5)