

EDUCATION

University of Southern California

Doctor of Philosophy (PhD), Electrical Engineering Advisor – C.-C. Jay Kuo

Research interests – 3D point cloud analysis and compression

Aug. 2020–May 2023

Los Angeles, CA

University of Southern California

Master of Science (Honors), Electrical Engineering GPA – 3.91

Relevant coursework – Multimedia Compression, Computer Vision, Machine Learning, Deep Learning

Aug. 2018–May 2020

Los Angeles, CA

Savitribai Phule Pune University

Bachelor of Engineering, Electronics and Telecommunication GPA – 3.90

Aug. 2014–May 2018

Pune, India

RESEARCH EXPERIENCE

Sony

Applied Research Intern

- Research on inter-prediction methods for dynamic point cloud compression with an aim to contribute to MPEG standards.

Aug. 2022–present

San Jose, CA

InterDigital

Research Intern

- Improved performance of conventional methods for dynamic LiDAR compression using deep learning techniques.
- Designed motion estimation and intra-/inter-mode prediction modules for dynamic point cloud compression.

May 2022–Aug. 2022

New York, NY

USC Media Communications Lab

Research Assistant

- Collaborated in research and development of unsupervised and feedforward feature learning method for 3D point clouds.
- Proposed methods for point cloud registration, LiDAR odometry, scene flow estimation and object pose estimation.

May 2019–May 2022

Los Angeles, CA

PROJECTS

Multimedia compression algorithms | C++

- Implemented compression algorithms like Shannon Fano, Huffman, Adaptive Huffman coding, Binary Arithmetic Coder, QM Coder and JPEG.
- Experimented with different motion estimation and rate control methods in H.264 video compression.

Structure from Motion (SfM) for 3D reconstruction | Python, OpenCV

- Reconstructed 3D point clouds of historic structures from pairs of images.
- Performed keypoint matching using SIFT and kNN, pose estimation from essential matrix and SVD, and triangulation.

Region based photorealistic image style transfer | Python, PyTorch

- Trained PSPNet on MIT ADE20K dataset for semantic segmentation of content and style images.
- Implemented segment-wise image stylization using Whitening and Coloring transform.

TECHNICAL SKILLS

Languages – Python, C++, Matlab, LaTeX

Libraries – PyTorch, Open3D, Minkowski Engine, Open3D, Scikit-learn

Certifications – Deep Learning Specialization (Coursera)

RECENT PUBLICATIONS

- PCRP: Unsupervised Point Cloud Object Retrieval and Pose Estimation. *IEEE International Conference on Image Processing (ICIP), 2022* [Paper]
- GreenPCO: An Unsupervised Lightweight Point Cloud Odometry Method. *IEEE International Workshop on Multimedia Signal Processing (MMSP), 2022* [Paper]
- R-PointHop: A Green, Accurate and Unsupervised Point Cloud Registration Method. *IEEE TIP, 2022* [Paper]
- 3D Point Cloud Analysis: Traditional, Deep Learning and Explainable Machine Learning Methods. *Springer* [Book]

ACHIEVEMENTS AND SERVICE

Awards – Masters Honors Fellowship, Best Project in Deep Learning

Teaching Assistant – Digital Image Processing (Spring'22), Linear Algebra (Fall'21)

Reviewer – IEEE ICIP, Springer Nature, APSIPA TSIP, ISPRS Journal on Photogrammetry and Remote Sensing