

EDUCATION

University of Southern California Doctor of Philosophy (PhD), Electrical Engineering <i>Research focus – 3D point cloud processing</i>	Advisor – C.-C. Jay Kuo <i>Los Angeles, CA</i>	Aug. 2020–May 2023 (expected)
University of Southern California Master of Science (Honors), Electrical Engineering <i>Relevant coursework – Computer Vision, Machine/Deep Learning, Robotics, Multimedia Compression</i>	GPA – 3.91	Aug. 2018–May 2020 <i>Los Angeles, CA</i>
Savitribai Phule Pune University Bachelor of Engineering, Electronics and Telecommunication	GPA – 3.90	Aug. 2014–May 2018 <i>Pune, India</i>

RESEARCH EXPERIENCE

USC Media Communications Lab Research Assistant	May 2019–present <i>Los Angeles, CA</i>
<ul style="list-style-type: none">• Collaborated in research and development of unsupervised and feedforward feature learning method for 3D point clouds.• Developed R-PointHop method for unsupervised point cloud registration of indoor scenes and CAD models.• Proposed methods for LiDAR odometry and object pose estimation.	
Inter University Center for Astronomy and Astrophysics (IUCAA) Research Intern	Sep. 2017–Mar. 2018 <i>Pune, India</i>
<ul style="list-style-type: none">• Analyzed satellite time series data and assisted in development of algorithm to detect Gamma Ray Bursts (GRBs).• Compared and applied Hidden Markov Models, Principal Components Analysis, and Friends of Friends clustering for anomaly detection.	

PROJECTS

Structure from Motion (SfM) for 3D reconstruction <i>Python, OpenCV</i>
<ul style="list-style-type: none">• 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.
Classification of quality of white wine <i>Python, Scikit-learn</i>
<ul style="list-style-type: none">• Predicted quality of white wine as good, medium, or bad using feature engineering and classification from 11 features.• Trained machine learning algorithms such as SVM, Naive Bayes, Random Forest, MLP and kNN.
Region based Photorealistic Image Style Transfer <i>Python, PyTorch</i>
<ul style="list-style-type: none">• Trained PSPNet on MIT ADE20K dataset for semantic segmentation of content and style images.• Implemented segment-wise image stylization using Whitening and Coloring transform.
Emotion detection from face images <i>Python, PyTorch, OpenCV</i>
<ul style="list-style-type: none">• Classified human emotions into eight categories by leveraging different CNNs and compared performance.

TECHNICAL SKILLS

Languages – Python, C++, Matlab, LaTeX
Libraries – PyTorch, PyTorch3D, OpenCV, Open3D, PCL, Scikit-learn
Certifications – Deep Learning Specialization (Coursera)

RECENT PUBLICATIONS

- R-PointHop: A Green, Accurate and Unsupervised Point Cloud Registration Method. *IEEE TIP, 2022* [Paper]
- PCRP: Unsupervised Point Cloud Object Retrieval and Pose Estimation. *arXiv:2202.07843*. [Paper]
- 3D Point Cloud Analysis: Traditional, Deep Learning and Explainable Machine Learning Methods. *Springer* [Book]
- GPCO: An Unsupervised Green Point Cloud Odometry Method. *arXiv:2112.04054*. [Paper]

ACHIEVEMENTS AND SERVICE

Awards – Masters Honors Fellowship, Best Project in Deep Learning
Teaching Assistant – Digital Image Processing (Spring'22), Linear Algebra (Fall'21)
Grader – Digital Image Processing (Spring'20), Random Processes (Spring'20), Communication Systems (Fall'19)
Reviewer – International Conference on Image Processing (ICIP), ISPRS Journal of Photogrammetry and Remote Sensing