Pranav Kadam

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Education

University of Southern California Aug. 2020–May 2023 (expected)
Doctor of Philosophy (PhD), Electrical Engineering Advisor – C.-C. Jay Kuo *Los Angeles, CA*
Research focus – 3D point cloud processing

University of Southern California Aug. 2018–May 2020
Master of Science (Honors), Electrical Engineering GPA – 3.91 *Los Angeles, CA*
Relevant coursework – Computer Vision, Machine/Deep Learning, Robotics, Multimedia Compression

Savitribai Phule Pune University Aug. 2014–May 2018
Bachelor of Engineering, Electronics and Telecommunication GPA – 3.90 *Pune, India*

Research Experience

USC Media Communications Lab May 2019–present
Research Assistant *Los Angeles, CA*

- 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) Sep. 2017–Mar. 2018
Research Intern *Pune, India*

- 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 | *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.

Classification of quality of white wine | *Python, Scikit-learn*

- 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 | *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.

Emotion detection from face images | *Python, PyTorch, OpenCV*

- 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 – ISPRS Journal of Photogrammetry and Remote Sensing