Pranav Kadam

📞 747-334-8822 ✉ hello@pranav3D.com 🌐 pranav3D.com

EDUCATION

University of Southern California — Aug. 2020–May 2023
Doctor of Philosophy (PhD), Electrical Engineering — *Los Angeles, CA*
Advisor – C.-C. Jay Kuo | Minor – Computer Science
Dissertation – Unsupervised Green Learning for 3D Point Cloud Data Processing

University of Southern California — Aug. 2018–May 2020
Master of Science (Honors), Electrical Engineering — *Los Angeles, CA*

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

EXPERIENCE

Tencent — May 2023–present
Senior Research Engineer — *Palo Alto, CA*
- Research and development of ongoing AOMedia VVM standard on Static Polygonal Mesh Coding.

Tencent — Feb. 2023–May 2023
Research Intern — *Palo Alto, CA*
- Researched methods to improve compression of static meshes by exploiting mesh symmetry.

Sony — Aug. 2022–Dec. 2022
Applied Research Intern — *San Jose, CA*
- Developed a deep predictor network for inter-prediction in dynamic dense point cloud compression.
- Designed rate control mechanism in deep learning based point cloud compression methods using gain/inverse gain units.
- Proposed unified neural network architecture and joint training approach for I- and P-frame compression.
- Achieved BD-Rate of -10% over SOTA deep learning method with fewer parameters and BD-Rate of -60% over V-PCC.

InterDigital — May 2022–Aug. 2022
Research Intern — *New York, NY*
- Designed intra-/inter-mode decision module for dynamic point cloud compression.
- Proposed training of scene flow estimation methods with unsupervised RD loss for dynamic point cloud compression.
- Improved performance of dynamic LiDAR compression over G-PCC using deep learning techniques.

PUBLICATIONS

- **Pranav Kadam**, Alexandre Zaghetto, Danillo Graziosi, Ali Tabatabai, Unified Intra/Inter Deep Dynamic Point Cloud Compression with Multiple Reference Frames and Rate Adaptation, MPEG-141 Online, Doc. m62066, January 2023
- **Pranav Kadam**, Hardik Prajapati, Min Zhang, Jintang Xue, Shan Liu, C-C Jay Kuo, S3I-PointHop: SO(3)-Invariant PointHop for 3D Point Cloud Classification, *IEEE ICASSP, 2023* [Paper]
- Min Zhang, Jintang Xue, **Pranav Kadam**, Hardik Prajapati, Shan Liu, C-C Jay Kuo, A Tiny Machine Learning Model for Point Cloud Object Classification, *APSIPA TSIP, 2023* [Paper]
- **Pranav Kadam**, Jiahao Gu, Shan Liu, C-C Jay Kuo, PointFlowHop: Green and Interpretable Scene Flow Estimation from Consecutive Point Clouds, *APSIPA TSIP, 2023* [Paper]
- Min Zhang, **Pranav Kadam**, Shan Liu, C-C Jay Kuo, GSIP: Green semantic segmentation of large-scale indoor point clouds, *Pattern Recognition Letters, 2022* [Paper]
- **Pranav Kadam**, Min Zhang, Shan Liu, C-C Jay Kuo, PCRP: Unsupervised Point Cloud Object Retrieval and Pose Estimation, *IEEE ICIP, 2022* [Paper]
- **Pranav Kadam**, Min Zhang, Jiahao Gu, Shan Liu, C-C Jay Kuo, GreenPCO: An Unsupervised Lightweight Point Cloud Odometry Method, *IEEE MMSP, 2022* [Paper]
- **Pranav Kadam**, Min Zhang, Shan Liu, C-C Jay Kuo, R-PointHop: A Green, Accurate and Unsupervised Point Cloud Registration Method, *IEEE TIP, 2022* [Paper]
- Shan Liu, Min Zhang, **Pranav Kadam**, C-C Jay Kuo, 3D Point Cloud Analysis: Traditional, Deep Learning and Explainable Machine Learning Methods, *Springer* [Book]
- **Pranav Kadam**, Min Zhang, Shan Liu, C-C Jay Kuo, Unsupervised point cloud registration via salient points analysis (SPA), *IEEE VCIP, 2020* [Paper]
- Min Zhang, **Pranav Kadam**, Shan Liu, C-C Jay Kuo, Unsupervised Feedforward Feature (UFF) for Point Cloud Classification and Segmentation, *IEEE VCIP, 2020* [Paper]
- Min Zhang, Yifan Wang, **Pranav Kadam**, Shan Liu, C-C Jay Kuo, Pointhop++: A Lightweight Learning Model on Point Sets for 3D Classification, *IEEE ICIP, 2020* [Paper]
- Min Zhang, Haoxuan You, **Pranav Kadam**, Shan Liu, C-C Jay Kuo, PointHop: An Explainable Machine Learning Method for Point Cloud Classification, *IEEE TMM, 2020* [Paper]

Technical Skills

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

Projects

Multimedia compression algorithms | *C++*
- Implemented compression algorithms like Shannon Fano, Huffman, Adaptive Huffman, 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.

Achievements and Service

Awards
- Masters Honors Fellowship, Mar. 2020
- Best Project in Deep Learning, May 2019

Teaching Assistant
- USC EE 559 – Machine Learning (Spring 2023)
- USC EE 569 – Digital Image Processing (Spring 2022)
- USC EE 510 – Linear Algebra (Fall 2021)

Course Grader
- USC EE 569 – Digital Image Processing (Spring 2020)
- USC EE 562 – Random Processes (Spring 2020)
- USC EE 567 – Communication Systems (Fall 2019)

Reviewer
- IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2024
- IEEE Transactions on Image Processing (TIP)
- IEEE International Conference on Image Processing (ICIP), 2022, 2023
- Elsevier Pattern Recognition
- APSIPA Transactions on Signal and Image Processing
- Springer Nature
- ISPRS Journal on Photogrammetry and Remote Sensing