Sateesh Kumar

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🖺 *scholar.google.com/citations/..*

Research Interests

Self-Supervised Learning, Video Understanding, Action Recognition, Robotics

Education

09/21–06/23 **University of California, San Diego**,
Master of Science in Computer Science, San Diego, California,
GPA – 3.92/4.0.

08/15–05/19 **National University of Computer and Emerging Sciences**,
Bachelor of Science in Computer Science, Karachi, Pakistan,
GPA – 3.91/4.0.
Bronze Medal – Ranked 3rd out of 332 students.

Publications

2022 **Inverse Reinforcement Learning from Diverse Third-Person Videos via Graph Abstraction**,
Under Review, 2022.
Sateesh Kumar, Jonathan Zamora, Nicklas Hansen, Rishabh Janghir, Xiaolong Wang

2022 **Unsupervised Activity Segmentation by Joint Representation Learning and Online Clustering**,
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2022.
Sateesh Kumar*, Sanjay Haresh*, Awais Ahmed, Zeeshan Zia, Quoc-Huy Tran

2021 **Learning by Aligning Videos in Time**,
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2021.
Sateesh Kumar*, Sanjay Haresh*, Huseyin Coskun, Shahram Syed, Andrey Konin, Zeeshan Zia, Quoc-Huy Tran

2020 **Towards Anomaly Detection in Dashcam Videos**,
IEEE Intelligent Vehicles Symposium, 2020.
Sateesh Kumar*, Sanjay Haresh*, Zeeshan Zia, Quoc-Huy Tran

2019 **Focused Anchor Loss: Cost-Sensitive learning of discriminative features for imbalanced classification**,
Asian Conference on Machine Learning, 2019.
Sateesh Kumar*, Bahram Baloch*, Sanjay Haresh*, Tahir Syed

Patent 2022 **System and method for correlating video frames in a computing environment**,
USPTO Granted Patent, 2022, Patent number: 11368756.
Sateesh Kumar, Quoc-huy Tran, Muhammad Zeeshan Zia, Andrey Konin, Sanjay Haresh, Shahram Najam Syed

Patent 2020 **System and Method for Building Computational Models of a Goal-Driven Task from Demonstration**,
USPTO Granted Patent, 2020, Patent number: 11017690.
Sateesh Kumar, Muhammad Zeeshan Zia, Quoc-Huy Tran, Andrey Konin, Sanjay Haresh

Work Experience

06/22–09/22 **Software Engineer(Computer Vision) Intern**, *TikTok*, Advisor: Dr. Heng Wang.
○ Working on multimodal representation learning from videos.

09/21–06/22 **Research Assistant**, *ECE, UCSD*, Advisor: Prof. Xiaolong Wang.
○ Developed a graph alignment based approach for learning a domain invariant and embodiment invariant reward function directly from video demonstrations.
○ Evaluated on four robotic tasks and achieved upto 60% performance improvement over baselines. Work under review at a a flagship robotic conference.

06/19–07/21 **Research Engineer, Computer Vision**, *Retrocausal*,
backed by TechStars, NASA Human Research Program, PACCAR.
Advisors: Dr. Zeeshan Zia & Dr. Quoc-Huy Tran

○ **Unsupervised Action Segmentation**
- Proposed a joint representation learning and online clustering approach for unsupervised action segmentation.
- Evaluated on four video datasets. Obtained upto 12% improvements over previous state-of-the-art. Work published at **CVPR 2022**.
○ **Self-Supervised Video Representation Learning**
- Developed a novel dynamic time warping based video alignment approach for self-supervised video representation learning.
- Achieved 20% improvement over supervised baselines on three standard datasets. This project led to a publication in **CVPR 2021**.
○ **RetroActivity: Rapidly Deployable Live Task Guidance Experiences**
- Designed, implemented and trained a deep learning model for video activity recognition.
- Voted as **Best Demo in IEEE ISMAR 2020** (Flagship augmented reality conference).

Teaching Experience

2022 **Introduction to Visual Learning (ECE285)**,
Teaching Assistant for a graduate class of 147 students at UCSD. Led Discussions on Piazza, prepared and graded assignments and course project.

2019 **Artifical Intelligence and Machine Learning Introductory Sessions**,
Conducted several sessions on introductory AI/ML topics for undergraduate students.

2018 **Deep Learning Training Sessions**,
*Prepared course material and assisted in teaching a 10-week deep learning for computer vision course at **Folio3** - A leading software house in Pakistan.*

2016 **Digital Logic and Design (EE227)**,
Teaching assistant for a class of 50 students at FAST NUCES.

Awards & Achievements

2020 **Best Demo Award IEEE ISMAR 2020**: Selected as the best demo among 19 accepted demonstrations at a flagship augmented reality conference.

2019	**Bronze Medal for 3rd Rank** in Computer Science - 2019, NUCES-Karachi.
2015-2019	Dean's List for all semesters, NUCES-Karachi.
2019	Winner Data Science Competition, Softec'19 Lahore: **Ranked 1st out of 50 teams from across Pakistan.**
2018-2019	Founder/Head - Artificial Intelligence and Machine Learning Club, ACM-NUCES.
2018	City-Winner Fishackathon (Karachi) by Hackernest: **Placed in the top-40 out of 3500+ teams** participating from across the world. Received $5000 AWS credits.

Talks

2017	Convolutional Neural Networks, DHA Suffa University, Karachi [Slides]
2018	Introduction to Artificial Intelligence and Machine Learning, NUCES, Karachi [Slides]
2019	Introduction to Deep Learning and Pytorch, NUCES, Karachi [Code]
2020	Temporal Cycle Consistency, AIDL group [Slides]
2021	Convolutional Neural Networks, Institute of Business Administration, Karachi [Slides]

Poster Presentations

2021	Learning by Aligning Videos in Time, Learning from Unlabelled Videos, CVPR, 2021
2022	Unsupervised Action Segmentation by Joint Representation Learning and Online Clustering, Baylearn, 2022
2022	Ensembles for Improved Explanation of Image Classification, Explainable Artificial Intelligence for Computer Vision, CVPR, 2022

Academic Service

2022	Reviewer, IEEE Conference on Computer Vision and Pattern Recognition (CVPR)
2022	Reviewer, European Conference on Computer Vision (ECCV)

Skills

Programming Languages: Python, C++, C, Java, MATLAB, R
Frameworks: Pytorch, Tensorflow, Keras, OpenCV, Scikit-Learn, OpenAI Gym
Other Primitive: AWS-EC2, GCP, Linux, Kubernetes

References

Prof. Xiaolong Wang: Assistant Professor, UCSD [contact]
Dr. Zeeshan Zia: CEO, Retrocausal, Inc [contact]
Dr. Quoc-Huy Tran: CTO, Retrocausal, Inc [contact]
Prof. Tahir Qasim Syed: Assistant Professor, IBA, Karachi [contact]