Sudhakar Kumawat

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Education

Indian Institute of Technology Gandhinagar — Gandhinagar, India

PhD, Computer Science and Engineering — Jan 2015 - Sept 2020

- Advisor: Dr. Shanmuganathan Raman
- Thesis topic: Challenges in Deep Visual Recognition: Algorithms and Novel Architectures.

Indian Institute of Technology (BHU) Varanasi — Varanasi, India

Integrated Dual Degree (B.Tech + M.Tech, 5 years), Computer Science and Engineering — July 2009 - May 2014

- CGPA 8.26/10

Experience

Osaka University — Osaka, Japan

Postdoctoral Fellow — Nov 2020 - Present

Gryt.fit — Pune, India

Lead Data Scientist — June 2020 - Nov 2020

MAQ Software — Hyderabad, India

Software Engineer — June 2014 - Dec 2014

Grants & Fellowships

- Received JSPS KAKENHI Early Career Scientist Research Grant (Role - PI, April 2022 - March 2024) *Click for more details
- Received TCS Research Fellowship (Jan 2015 - Dec 2018)
- Received travel grant from Google India for CVPR 2019
- Received travel grant from TCS India for ICASSP 2019

Awards & Honors

- Awarded best paper runner up award at NCVPRIPG 2019

Professional Services

- Conference Review: CVPR (2022) | ECCV (2020, 2022) | ICCV (2021) | WACV (2021) | AAAI (2021, 2022) | ICLR (2022) | NeurIPS (2022)
- Journal Review: Journal of Visual Communication and Image Representation (JVCI), Elsevier

Publications

Journal

- **Sudhakar Kumawat**, Tadashi Okawara, Michitaka Yoshida, Hajime Nagahara, and Yasushi Yagi, “Action Recognition From Single Coded Image”, IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), 2022
- **Sudhakar Kumawat**, Manisha Verma, Yuta Nakashima, and Shanmuganathan Raman, “Depthwise 3D STFT Based 3D Convolutional Neural Networks for Human Action Recognition”, IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), 2021

Conference

- **Sudhakar Kumawat** and Hajime Nagahara, “Privacy-Preserving Action Recognition via Motion Difference Quantization”, European Conference on Computer Vision (ECCV), 2022
- **Sudhakar Kumawat**, Gagan Kanojia and Shanmuganathan Raman, “ShuffleBlock: Shuffle to Regularize Deep Convolutional Neural Networks”, National Conference on Communications (NCC), 2022

- **Sudhakar Kumawat** and Shanmuganathan Raman, “Depthwise-STFT based separable Convolutional Neural Networks”, IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2020
- **Sudhakar Kumawat**, Manisha Verma, Yuta Nakashima, and Shanmuganathan Raman, “Yoga-82: A New Dataset for Fine-grained Classification of Human Poses”, CVPR workshop on Towards Human-Centric Image/Video Synthesis and the Look-Into-Person Challenge, 2020

- Davinder Singh, Naman Jain, Pranjali Jain, Pratik Kayal, **Sudhakar Kumawat**, and Nipun Batra, “PlantDoc: a dataset for visual plant disease detection”, ACM IKDD CoDS and COMAD, 2020
- Gagan Kanojia, **Sudhakar Kumawat** and Shanmuganathan Raman, “Exploring Temporal Differences in 3D Convolutional Neural Networks”, National Conference on Computer Vision, Pattern Recognition, Image Processing and Graphics (NCVPRIPG), 2019
- Gagan Kanojia, **Sudhakar Kumawat** and Shanmuganathan Raman, “Attentive Spatio-Temporal Representation Learning for Diving Classification”, CVPR workshop on Computer Vision in Sports (CVsports), 2019
- **Sudhakar Kumawat**, Manisha Verma and Shanmuganathan Raman, “LBVCNN: Local Binary Volume Convolutional Neural Network for Facial Expression Recognition from Image Sequences”, CVPR workshop on Analysis and Modeling of Faces & Gestures, 2019
- **Sudhakar Kumawat** and Shanmuganathan Raman, “LP-3DCNN: Unveiling Local Phase in 3D Convolutional Neural Networks”, IEEE / CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2019
- **Sudhakar Kumawat** and Shanmuganathan Raman, “Local Phase U-Net for Fundus Image Segmentation”, IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2019
- **Sudhakar Kumawat** and Souradyuti Paul, “A New Constant-Size Accountable Ring Signature Scheme Without Random Oracles”, Inscrypt, 2017

Research Interests

My current research is focused on developing computational cameras for privacy preserving action recognition, transfer learning in deep sensing / optics for various applications.

I am also interested in a fuller understanding of 3D Convolutional Neural Networks (CNNs) for action recognition. I am actively exploring efficient methods of learning the spatial, temporal and channel correlations in 3D CNNs. My recent efforts are directed towards designing new models by combining techniques from classical computer vision with deep learning methods in order to reduce space-time complexity of 3D CNNs.

I also have broader interests in low resolution video understanding, pose detection in videos, regularizing deep 3D CNN models, reducing space-time complexity in 2D CNNs.