Kuldeep S. Kulkarni

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Summary

I build generative models for images and video and take them from research to product. In 7+ years at Adobe Research, my work—from GANs to large video diffusion transformers—has appeared at top venues including CVPR, ICCV and ICLR, and has shipped in Adobe Firefly Video and Photoshop Elements. As the first computer vision researcher at Adobe Research India, I have played a major role in growing the team by attracting top computer vision talent, and have mentored 30+ interns, predocs and students, many of whom went on to graduate programs at Oxford, NYU, Stanford and CMU.

Employment

Research Scientist at **Adobe Research, Bengaluru** (Mar 2019- present)
Post-doctoral Researcher at **Carnegie Mellon University, Pittsburgh** (August 2017- Feb 2019)

Education

- **PhD** in Electrical Engineering (Fall 2012 - Summer 2017), Arizona State University, Tempe

Product Impact:

- Our training-free method for accelerating video diffusion transformers is shipped in Adobe Firefly Video, making its generative video editing and edit propagation ∼40% faster and cheaper.
- Our image animation technology, "Moving Elements", that is inspired by our CVPR 2022 paper is shipped to and is available in Adobe Photoshop Elements 2023. Media coverage: Forbes, TechCrunch.

Submissions Under Review

- The Unreasonable Effectiveness of Shallow Verifiers: Faster and Cheaper Video Diffusion Inference without Training
- Character Motion Signature: Learning Reusable Motion Identity from Multiple Reference Videos
- GRAVITY: Physically Grounded Audio-Visual Object Removal

Publications, Book Chapters and Patents

- Nithin C Babu, Aniruddha Mahapatra, Harsh Rangwani, **Kuldeep Kulkarni**, Rajiv Soundararajan, Efficient Adaptation of AI-Generated Video Quality Assessment with Quality Descriptions, TMLR 2026
- Saksham Singh Kushwaha, Sayan Nag, Yapeng Tian, **Kuldeep Kulkarni**, Object-WIPER: Training-Free Object and Associated Effect Removal in Videos, CVPR 2026
- Divya Jyoti Bajpai, Shubham Agarwal, Apoorv Saxena, **Kuldeep Kulkarni**, Subrata Mitra, Manjesh Kumar Hanawal, FlowCast: Trajectory Forecasting for Scalable Zero-Cost Speculative Flow Matching, ICLR 2026
- Nithin C Babu, Aniruddha Mahapatra, Harsh Rangwani, Rajiv Soundararajan, **Kuldeep Kulkarni**, A Closer Look at Evaluation of Text-to-Video Models Under Camera Motion, arXiv 2025
- Harsh Rangwani, Aishwarya Agarwal, **Kuldeep Kulkarni**, R Venkatesh Babu, Srikrishna Karanam, Composing Parts for Expressive Object Generation, CVPR 2025
- Swasti Shreya Mishra, **Kuldeep Kulkarni**, Duygu Ceylan, Balaji Vasan Srinivasan, FloAt: Flow Warping of Self-Attention for Clothing Animation Generation, arXiv 2024
- Nihal Jain, Praneetha Vaddamanu, Paridhi Maheshwari, Vishwa Vinay, **Kuldeep Kulkarni**, Self-supervised multi-view disentanglement for expansion of visual collections, WSDM 2023
- Hugo Bertiche, Niloy J Mitra, **Kuldeep Kulkarni**, Chun-Hao P Huang, Tuanfeng Y Wang, Meysam Madadi, Sergio Escalera, Duygu Ceylan, Blowing in the wind: Cyclenet for human cinemagraphs from still images, CVPR 2023
- Rishi Agarwal, Tirupati Saketh Chandra, Vaidehi Patil, Aniruddha Mahapatra, **Kuldeep Kulkarni**, Vishwa Vinay, GEMS: Scene expansion using generative models of graphs, WACV 2023
- Aniruddha Mahapatra, **Kuldeep Kulkarni**, Controllable animation of fluid elements in still images, CVPR 2022

- Bholeshwar Khurana, Soumya Ranjan Dash, Abhishek Bhatia, Aniruddha Mahapatra, Hrituraj Singh, **Kuldeep Kulkarni**, 'SemIE: Semantically-aware Image Extrapolation', ICCV 2021
- **Kuldeep Kulkarni**, Tejas Gokhale, Rajhans Singh, Pavan Turaga, Aswin Sankaranarayanan, 'Halluci-Net: Scene Completion by Exploiting Object Co-occurrence Relationships', CVPR 2021 Workshop
- Michael Jones, Tim Marks, **Kuldeep Kulkarni**, Method and System for Detecting Actions in Videos using Contour Sequences, US Patent 15/670,021, 2019
- Suhas Lohit, Rajhans Singh, **Kuldeep Kulkarni**, Pavan Turaga, Rank-Regularized Measurement Operators for Compressive Imaging, Asilomar Conference, 2019
- **Kuldeep Kulkarni**, Pavan Turaga, Anuj Srivastava, Rama Chellappa, Pattern Recognition, **Wiley Encyclopedia on Electrical and Electronics Engineering**.
- **Kuldeep Kulkarni**, Suhas Lohit, Pavan Turaga, Ronan Kerviche, Amit Ashok, 'ReconNet: Non-Iterative Reconstruction of Images from Compressively Sensed Measurements', CVPR 2016 [**citations:** $\sim$ 1100].
- Suhas Lohit, **Kuldeep Kulkarni**, Ronan Kerviche, Pavan Turaga, Amit Ashok, 'Convolutional Neural Networks for Non-iterative Reconstruction of Compressively Sensed Images', IEEE Transactions on Computational Imaging 2018
- **Kuldeep Kulkarni**, Pavan Turaga, 'Reconstruction-Free Action Inference from compressive imagers', IEEE Transactions on Pattern Analysis and Machine Intelligence, 2016
- **Kuldeep Kulkarni**, Pavan Turaga, 'Fast integral image estimation at 1% measurement rate', arXiv 2016
- Sohil Shah, **Kuldeep Kulkarni**, Arijit Biswas, Ankit Gandhi, Om Deshmukh, Larry Davis, 'Weakly Supervised Learning of Heterogeneous Concepts in Videos', ECCV 2016
- Suhas Lohit, **Kuldeep Kulkarni**, Pavan Turaga, Jian Wang, Aswin Sankaranarayanan, 'Reconstruction-free Inference on Compressive Measurements', 4th IEEE Workshop on Computational Cameras and Displays (CCD), held in conjunction with IEEE CVPR, 2015. **(Best Paper Award)**
- Mayank Gupta*, Arjun Jauhari*, **Kuldeep Kulkarni**, Suren Jayasuriya, Alyosha Molnar, Pavan Turaga, 'Compressive Light Field Reconstructions using Deep Learning', at CVPR 2017 CCD workshop
- Suhas Lohit, **Kuldeep Kulkarni**, Pavan Turaga, 'Direct Inference on Compressive Measurements using Convolutional Neural Networks', ICIP 2016
- **Kuldeep Kulkarni**, Pavan Turaga, 'Recurrence Textures for Activity Recognition from compressive cameras', ICIP 2012
- Ankit Gandhi, Arijit Biswas, Om Deshmukh, Sohil Shah, **Kuldeep Kulkarni**, Method and System for Multimedia Processing to Identify Concepts in Multimedia, patent application submitted to USPTO.
- Li-Chi Huang, **Kuldeep Kulkarni**, Anik Jha, Suhas Lohit, Suren Jayasuriya, Pavan Turaga, CS-VQA: Visual Question Answering with Compressively Sensed Images, ICIP 2018.

Patents

About 25 patents that are in various stages (issued or filed yet to be issued or accepted yet to be filed). Please check my Google scholar profile for the full list of issued patents so far.

Mentoring Experience

I have mentored 30+ undergrad, masters and PhD students as well as research associates/predocs. Please find the full list and their current coordinates on my website.