Krishna Kumar Singh
Research Scientist and Manager, Adobe Research
Webpage: kkanshul.github.io

kkanshul@gmail.com
krishsin@adobe.com
Phone:7248718714

EDUCATION

- **University of California, Davis** (Fall, 2015 – Spring, 2020)
  - PhD in Computer Science **GPA: 3.93** Advisor: **Prof. Yong Jae Lee**
- **Robotics Institute, Carnegie Mellon University, USA (**August 2013 – December 2014)
  - Masters in Robotics QPA: **4.05** Advisors: **Prof. Alexei Efros, Prof. Kayvon Fatahalian**
- **International Institute of Information Technology (IIIT), Hyderabad, India (**August 2009 – May 2013)
  - B.Tech (Honours) in Computer Science and Engineering GPA: **9.07/10** Advisor: **Prof. P. J. Narayanan**

INTERESTS

- **Computer Vision and Machine Learning** *esp.* to generative models for image generation and editing.

PUBLICATIONS

- **P2D: Plug and Play Discriminator for accelerating GAN frameworks:** Min Jin Chong, **Krishna Kumar Singh**,Yijun Li, Jingwan Lu, David Forsyth. Winter Conference on Applications of Computer Vision (WACV), 2024
- **Discovering and Mitigating Biases in CLIP-based Image Editing:** Md Mehrab Tanjim, **Krishna Kumar Singh**, Kushal Kafle, Ritwik Sinha, Garrison W. Cottrell. Winter Conference on Applications of Computer Vision (WACV), 2024
- **Consistent Multimodal Generation via A Unified GAN Framework:** Zhen Zhu, Yijun Li, Weijie Lyu, **Krishna Kumar Singh** , Zhixin Shu, Sören Pirk, Derek Hoiem. Winter Conference on Applications of Computer Vision (WACV), 2024 [Paper Link]
- **UMFuse: Unified Multi View Fusion for Human Editing applications:** Rishabh Jain, Mayur Hemani, Duygu Ceylan, **Krishna Kumar Singh**, Jingwan Lu, Mausoom Sarkar, Balaji Krishnamurthy. IEEE International Conference on Computer Vision (ICCV), 2023 [Paper Link]
- **Zero-shot Image-to-Image Translation:** Gaurav Parmar, **Krishna Kumar Singh**, Richard Zhang, Yijun Li, Jingwan Lu, Jun-Yan Zhu. ACM Transactions on Graphics (SIGGRAPH), 2023 [Project Page]
- **Modulating Pretrained Diffusion Models for Multimodal Image Synthesis:** Cusuh Ham, James Hays, Jingwan Lu, **Krishna Kumar Singh**, Zhifei Zhang, Tobias Hinz. ACM Transactions on Graphics (SIGGRAPH), 2023 [Project Page]
- **Putting People in Their Place: Affordance-Aware Human Insertion into Scenes:** Sumith Kulal, Tim Brooks, Alex Aiken, Jiajun Wu, Jimei Yang, Jingwan Lu, Alexei A Efros, **Krishna Kumar Singh**. IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2023 [Project Page]
- **VGFlow: Visibility guided Flow Network for Human Reposing:** Rishabh Jain, **Krishna Kumar Singh**, Mayur Hemani, Jingwan Lu, Mausoom Sarkar, Duygu Ceylan, Balaji Krishnamurthy. IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2023 [Paper Link]
- **Complete 3D Human Reconstruction from a Single Incomplete Image:** Junying Wang, Jae Shin Yoon, Tuanfeng Y. Wang, **Krishna Kumar Singh**, and Ulrich Neumann. IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2023 [Project Page]
- **Debiasing Image-to-Image Translation Models:** Md Mehrab Tanjim, **Krishna Kumar Singh**, Kushal Kafle, Ritwik Sinha, Garrison W. Cottrell. British Machine Vision Conference (BMVC), 2022 [Project Page]
- **Contrastive Learning for Diverse Disentangled Foreground Generation:** Yuheng Li, Yijun Li, Jingwan Lu, Eli Shechtman, Yong Jae Lee, **Krishna Kumar Singh.** European Conference on Computer Vision (ECCV) , 2022. [Project Page]
- **Discovering and Mitigating Biases in CLIP-based Text-to-Image Generation:** Md Mehrab Tanjim, **Krishna Kumar Singh**, Kushal Kafle, Ritwik Sinha, Garrison W. Cottrell. Responsible Computer Vision workshop, ECCV 2022
- **Spatially-Adaptive Multilayer Selection for GAN Inversion and Editing:** Gaurav Parmar, Yijun Li, Jingwan Lu, Richard Zhang, Jun-Yan Zhu, **Krishna Kumar Singh** IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2022 [Project Page]
- **GIRAFFE HD: A High-Resolution 3D-aware Generative Model:** Yang Xue, Yuheng Li, **Krishna Kumar Singh** , Yong Jae Lee. IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2022. [Project Page]

- **InsetGAN for Full-Body Image Generation:** Anna Frühstück, **Krishna Kumar Singh**, Eli Shechtman, Niloy J. Mitra, Peter Wonka, Jingwan Lu. IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2022. [Project Page]
- **Generating and Controlling Diversity in Image Search:** Md Mehrab Tanjim, Ritwik Sinha, **Krishna Kumar Singh**, Sridhar Mahadevan, David Arbour, Moumita Sinha, Garrison W. Cottrell. Winter Conference on Applications of Computer Vision (WACV), 2022. [Paper]
- **Dance In the Wild: Monocular Human Animation with Neural Dynamic Appearance Synthesis:** Tuanfeng Y. Wang, Duygu Ceylan, **Krishna Kumar Singh**, Niloy J. Mitra. International Conference on 3D Vision (3DV), 2021. (oral presentation) [Project Page]
- **PartGAN: Weakly-supervised Part Decomposition for Image Generation and Segmentation:** Yuheng Li, **Krishna Kumar Singh ,** Yang Xue, Yong Jae Lee. British Machine Vision Conference (BMVC), 2021. [Paper]
- **Collaging Class-specific GANs for Semantic Image Synthesis:** Yuheng Li, Yijun Li, Jingwan Lu, Eli Shechtman, Yong Jae Lee, **Krishna Kumar Singh.** Proceedings of the IEEE International Conference on Computer Vision (ICCV), 2021. [Project Page]
- **Seeing the Unseen: Predicting the First-Person Camera Wearer's Location and Pose in Third-Person Scenes:** Yangming Wen, **Krishna Kumar Singh**, Markham Anderson, Wei-Pang Jan, Yong Jae Lee. International Workshop on Egocentric Perception, Interaction and Computing (EPIC), ICCV 2021. [Paper]
- **IMAGINE: Image Synthesis by Image-Guided Model Inversion**: Pei Wang, Yijun Li, **Krishna Kumar Singh**, Jingwan Lu, Nuno Vasconcelos. IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2021. [Paper]
- **Generating Furry Cars: Disentangling Object Shape and Appearance across Multiple Domains**: Utkarsh Ojha, **Krishna Kumar Singh**, Yong Jae Lee. International Conference on Learning Representations (ICLR), 2021. [Paper]
- **Elastic-InfoGAN: Unsupervised Disentangled Representation Learning in Class-Imbalanced Data:** Utkarsh Ojha, **Krishna Kumar Singh**, Cho-Jui Hsieh, Yong Jae Lee. Advances in Neural Information Processing Systems (NeurIPS) 2020. [Project Page].
- **Don't Judge an Object by Its Context: Learning to Overcome Contextual Bias: Krishna Kumar Singh**, Dhruv Mahajan, Kristen Grauman, Yong Jae Lee, Matt Feiszli, Deepti Ghadiyaram. IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2020. [Paper]
- **MixNMatch: Multifactor Disentanglement and Encoding for Conditional Image Generation:** Yuheng Li, **Krishna Kumar Singh**, Utkarsh Ojha, Yong Jae Lee. IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2020. [Project Page].
- **FineGAN: Unsupervised Hierarchical Disentanglement for Fine-Grained Object Generation and Discovery: Krishna Kumar Singh*,** Utkarsh Ojha*, Yong Jae Lee. *in* IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2019 (Oral). [Project Page].
- **You reap what you sow: Generating High Precision Object Proposals for Weakly-supervised Object Detection: Krishna Kumar Singh**, Yong Jae Lee. *in* IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2019.
- **Hide-and-Seek: A Data Augmentation Technique for Weakly-Supervised Localization and Beyond: Krishna Kumar Singh,** Hao Yu, Aron Sarmasi, Gautam Pradeep, Yong Jae Lee. Arxiv. [Paper].
- **DOCK: Detecting Objects by transferring Common-sense Knowledge: Krishna Kumar Singh**, Santosh Divvala, Ali Farhadi, Yong Jae Lee. *Appeared in* European Conference on Computer Vision (ECCV), 2018. [Project Page]
- **Who Will Share My Image? Predicting the Content Diffusion Path in Online Social Networks:** Wenjian Hu, **Krishna Kumar Singh***, Fanyi Xiao*, Jinyoung Han, Chen-Nee Chuah, Yong Jae Lee. *Appeared in* ACM International Conference on Web Search and Data Mining (WSDM), 2018. [Paper] (* equal contribution)
- **Hide-and-Seek: Forcing a Network to be Meticulous for Weakly-supervised Object and Action Localization: Krishna Kumar Singh,** Yong Jae Lee. *Appeared in* International Conference on Computer Vision (ICCV), 2017. [Project Page]
- **Identifying First-Person Camera Wearers in Third-Person Videos:** Chenyou Fan, Jangwon Lee, Mingze Xu, **Krishna Kumar Singh**, Yong Jae Lee, David J. Crandall, Michael S. Ryoo. *Appeared in* IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2017. [Paper]
- **End-to-End Localization and Ranking for Relative Attributes: Krishna Kumar Singh,** Yong Jae Lee. *Presented in* European Conference on Computer Vision (ECCV), 2016. [Project Page]
- **Track and Transfer: Watching Videos to Simulate Strong Human Supervision for Weakly-Supervised Object Detection: Krishna Kumar Singh,** Fanyi Xiao, Yong Jae Lee. *Presented in* IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2016. [Project Page]

- **KrishnaCam: Using a Longitudinal, Single-Person, Egocentric Dataset for Scene Understanding Tasks: Krishna Kumar Singh,** Kayvon Fatahalian, Alexei A. Efros. *Presented in* Winter Conference on Applications of Computer Vision (WACV), 2016. [Project Page]
- **Storytelling Patches: Predicting Tourist Spots in a City:** Aayush Bansal, **Krishna Kumar Singh**. *Presented in* ECCV 2014, Workshop on Storytelling with Images and Videos (VisStory). [Paper]
- **Geometry Directed Browser for Personal Photographs:** Aditya Deshpande, Siddharth Choudhary, P J Narayanan, **Krishna Kumar Singh**, Kaustav Kundu , Aditya Singh and Apurva Kumar. *Appeared in* Eighth Indian Conference On Vision, Graphics And Image Processing (ICVGIP), 2012 (Oral). [Paper]
- **Hybrid Multi-Core Algorithms for Regular Image Filtering Applications:** Shrenik Lad, **Krishna Kumar Singh**, Kishore Kothapalli and P.J. Narayanan. *Appeared in* International Conference on High Performance Computing (HiPC) Student Research Symposium, 2012. [Paper]

Industry/Tech Transfers

- **Generative Fill and Expand in Adobe Photoshop (core researcher for modeling). [Link]**
- **Skin Smoothing Neural Filter in Adobe Photoshop [Link]**
- **Project Strike a Pose at Adobe Max Sneak [Link]**

WORK AND TEACHING EXPERIENCE

- Research Scientist and Manager, Adobe Research (Current).
- Research intern, Facebook AI (Summer, 2019). Advisors: **Dr. Deepti Ghadiyaram, Dr. Dhruv Mahajan, Dr. Matt Feiszli,** and **Prof. Kristen Grauman**. Worked on removing the context bias while doing object and attribute classification.
- Research intern, Allen Institute for Artificial Intelligence (AI2) (Summer, 2017) Advisors: **Dr. Santosh Divvala**, **Prof. Ali Farhadi**. Worked on improving object detection by transferring common-sense knowledge.
- Computer Vision intern at Intel Labs (Summer, 2015): Worked on video summarization and retrieval.
- Co-instructor for Computer Vision course at UC Davis (Spring, 2020). [**Course Link**]
- Graduate Research and Teaching Assistant at UC, Davis (2015 – 2020) Advisor: **Prof. Yong Jae Lee**.
- Graduate Research Assistant at RI, CMU (Spring 2014 - 2015) Advisors: **Prof. Alexei Efros, Prof. Kayvon Fatahalian**.
- Research Scholar at RI, CMU (Summer, 2012) Advisor: **Prof. Martial Hebert**.
- Research Assistant at IIIT-Hyderabad (Summer 2011) and developed DLD virtual lab. Advisor: **Prof. P. J. Narayanan**.
- Teaching Assistant at IIIT-Hyderabad for Information Retrieval and Extraction, Data Structures and Cloud Computing.

PATENTS

- **Diverse Image Inpainting Using Contrastive Learning** (with Adobe Research)
- **Generating synthesized digital images utilizing class-specific machine-learning models** (with Adobe Research)
- **Generating synthesized digital images utilizing a multi-resolution generator neural network** (with Adobe Research)
- **Generating simulated images that enhance socio-demographic diversity** (with Adobe Research)
- **Generating animated digital videos utilizing a character animation neural network informed by pose and motion embeddings** (with Adobe Research)
- **Image Inversion Using Multiple Latent Spaces** (with Adobe Research)
- **Synthesizing digital images utilizing image-guided model inversion of an image classifier** (with Adobe Research)
- **Video Summarization Using Semantic Information** (with Intel Labs).
- **Visual Search and Retrieval Using Semantic Information** (with Intel Labs).
- **Several other patents under filing** (with Adobe Research).

RELEVANT COURSEWORK

- **Graduate Coursework:** Computer Vision, Machine Learning, The Visual World as seen by the Neurons and Machines, Big Data Approaches in Computer Vision, Visual Recognition, Visual Computing Systems, Math Fundamentals for Robotics.
- **Undergraduate Coursework:** Computer Vision, Digital Image Processing, Machine Learning, Statistical Methods in Artificial Intelligence, Artificial Intelligence, Computer Graphics, Information Extraction and Retrieval.

TECHNICAL SKILLS

Programming/Scripting Languages	Python, C, C++, Java (basic), Lua
Vision/Deep Learning/Graphics	PyTorch , Caffe, Torch, OpenGL, Matlab, OpenCV(basic)
Miscellaneous	FFmpeg, Eclipse, Vim, Git, Hadoop, EC2, CudaC (basic), OpenMP, Web2py, HTML

ACHIEVEMENTS AND AWARDS

- **Generative Fill and Expand: Awarded by TIME as one of best inventions of 2023 [**link**]**
- **Presented at Adobe Max Sneaks** [link]
- **Selected for ICCV 2019 Doctoral Consortium.**
- **UC Davis Best Graduate Researcher in Computer Science Award (Honorable Mention),** 2019
- **UC Davis Graduate Student Travel Award**, 2017.
- **Microsoft Azure Research Award**, 2017 and **AWS Research Grant**, Amazon Web Services, Inc., 2016.
- **Dean's List of Academic Excellence** for all the undergraduate academic years.
- **IIIT-H Research Award**, 2012 – in recognition of research contribution by an undergraduate.
- **Best Poster Award** (Using GPU technologies) from **Nvidia** in Student Research Symposium, **HiPC**, 2012.
- **All India Rank 1902 (99.8 percentile)** in All India Engineering Entrance Examination (AIEEE) 2009 (**962,119 candidate**s).

SERVICES

- Served as SPC (Senior Program Committee) for AAAI 2023
- Reviewer, CVPR, ICCV, ECCV, NeurIPS, ICML, SIGGRAPH, SIGGRAPH Asia, TPAMI, IJCV, AAAI, IJCAI, WACV, BMVC, and ICVGIP.
- Program Committee: 4th Workshop on Egocentric (First-Person) Vision CVPR 2016, International Workshop on Assistive Vision ACCV 2016, International Workshop on Attention/Intention Understanding ACCV 2018.
- Mentored a high school student for the project “Fruit detection in the images using deep network” as part of Aggiementor program at UC Davis. Student won the first prize at the national level (among 12 universities).