Gopal Sharma

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Current Position

Postdoctoral Researcher, *The University of British Columbia*, Vancouver
(with Dr. Kwang Moo Yi and Dr. Andrea Tagliasacchi) 2022 – Present

Education

Ph.D. in Computer Science, *University of Massachusetts, Amherst* (3.86/4.00) 2016 – 2022
Thesis: *Representation Learning for Shape Decomposition, By Shape Decomposition*
Advisor: Dr. Subhransu Maji and Dr. Evangelos Kalogerakis

B.Tech. in Electrical Engineering, *Indian Institute of Technology, Roorkee* (8.6/10.0) 2012 – 2016

Work Experience

Research Intern, *Nvidia*, Toronto (with Dr. Sanja Fidler and Dr. Kangxue Yin) 2021
Research Intern, *Adobe*, San Jose (with Dr. Radomír Měch and Dr. Siddhartha Chaudhuri) 2019
Research intern, *KAUST* (with Dr. Bernard Ghanem) 2015

Research Interests

Intersection of computer vision, computer graphics and machine learning, with emphasis on neural rendering (NeRFs and Gaussian Splatting) and Diffusion models.

Publications [Google Scholar: 0.5k+ citations and an h-index of 10]

2024

3D Gaussian Splatting as Markov Chain Monte Carlo
Shakiba Kheradmand, Daniel Rebain, **Gopal Sharma**, Weiwei Sun, Jeff Tseng, Hossam Isack, Kar Abhishek, Andrea Tagliasacchi, and Kwang Moo Yi
Arxiv 2024

Volumetric Rendering with Baked Quadrature Fields
Gopal Sharma, Daniel Rebain, Andrea Tagliasacchi, and Kwang Moo Yi
ECCV 2024

PointNeRF++: A multi-scale, point-based Neural Radiance Field
Weiwei Sun, Eduard Trulls, Yang-Che Tseng, Sneha Sambandam, **Gopal Sharma**, Andrea Tagliasacchi, and Kwang Moo Yi
ECCV 2024

Unsupervised Keypoints from Pretrained Diffusion Models
Eric Hedlin, **Gopal Sharma**, Shweta Mahajan, Xingzhe He, Hossam Isack, Abhishek Kar, Helge Rhodin, Andrea Tagliasacchi, and Kwang Moo Yi
CVPR 2024 **(Spotlight)**

Accelerating Neural Field Training via Soft Mining
Shakiba Kheradmand, Daniel Rebain, **Gopal Sharma**, Hossam Isack, Kar Abhishek, Andrea Tagliasacchi, and Kwang Moo Yi
CVPR 2024

2023

Unsupervised Semantic Correspondence Using Stable Diffusion
Eric Hedlin, **Gopal Sharma**, Shweta Mahajan, Hossam Isack, Abhishek Kar, Andrea Tagliasacchi, and Kwang Moo Yi
NeurIPS 2023

2022

PriFit: Learning to Fit Primitives Improves Few Shot Point Cloud Segmentation
Gopal Sharma, Bidya Dash, Matheus Gadelha, Aruni RoyChowdhury, Marios Loizou, Evangelos Kalogerakis, Liangliang Cao, and Erik Learned-Miller
Computer Graphics Forum 2022 (**Oral**)

MvDeCor: Multi-view Dense Correspondence Learning for Fine-grained 3D Segmentation
Gopal Sharma, Kangxue Yin, Subhransu Maji, Evangelos Kalogerakis, Or Litany, and Sanja Fidler
European Conference on Computer Vision 2022

Attention beats concatenation for conditioning neural fields
Daniel Rebain, Mark J Matthews, Kwang Moo Yi, **Gopal Sharma**, Dmitry Lagun, and Andrea Tagliasacchi
Transaction of Machine Learning Research 2022

Representation Learning for Shape Decomposition, By Shape Decomposition
Gopal Sharma
PhD Thesis, University of Massachusetts Amherst 2022

2020

Label-efficient learning on point clouds using approximate convex decompositions
Matheus Gadelha, Aruni RoyChowdhury, **Gopal Sharma**, Evangelos Kalogerakis, Liangliang Cao, Erik Learned-Miller, Rui Wang, and Subhransu Maji
Computer Vision–ECCV 2020: 16th European Conference on Computer Vision 2020

ParSeNet: A Parametric Surface Fitting Network for 3D Point Clouds
Gopal Sharma, Difan Liu, Evangelos Kalogerakis, Siddhartha Chaudhuri, and Radomír Měch
ECCV: European Conference on Computer Vision 2020

2019

Search-guided, lightly-supervised training of structured prediction energy networks
Amirmohammad Rooshenas, Dongxu Zhang, **Gopal Sharma**, and Andrew McCallum
Advances in Neural Information Processing Systems 2019

Learning point embeddings from shape repositories for few-shot segmentation
Gopal Sharma, Evangelos Kalogerakis, and Subhransu Maji
2019 International Conference on 3D Vision (3DV) 2019 (**Oral**)

2018

CSGNet: Neural shape parser for constructive solid geometry
Gopal Sharma, Rishabh Goyal, Difan Liu, Evangelos Kalogerakis, and Subhransu Maji
Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition 2018

2016

Persistent aerial tracking system for uavs
Matthias Mueller, **Gopal Sharma**, Neil Smith, and Bernard Ghanem
2016 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2016

Invited Talks

0. *Stable-Keypoints: Unsupervised learning of key points using Stable Diffusion Models*, MathWorks 2024
1. *MvDeCoR: Multi-view Dense Correspondence Learning for Fine-grained 3D Segmentation*, Google Brain 2022
2. *ParSeNet: A Parametric Surface Fitting Network for 3D Point Clouds*, Invited talk at 3d Structure and Compositional Learning workshop. ICCV 2021
3. *Fine-grained 3D shape co-segmentation via pixel-based contrastive learning*, Nvidia Toronto 2021
4. *Reinforcement learning for game programming*, Game programming course at UMass Amherst 2021
5. *Unity Machine Learning Agents*, Game programming course at UMass Amherst 2020
6. *CSGNet: Neural Shape Parser for Constructive Solid Geometry*, New England Computer Vision Workshop, Harvard University 2018

Interns and Students

Eric Hedlin PhD student at UBC 2022 – present
Shakiba Kheradmand PhD student at UBC 2022 – present
Bidya Dash MSc student at UMass Amherst 2021
Rishabh Goyal Visiting intern at UMass Amherst 2017

Professional Activities

3DV Program Committee 2024

Reviewing

IEEE Conference on Computer Vision and Pattern Recognition (CVPR)
IEEE International Conference on Computer Vision (ICCV)
International Conference on the Constraint Programming, AI, and Operations Research (CPAIOR)
International Conference on Machine Learning (ICML)
Journal of Machine Learning Research (JMLR)
Neural Information Processing Systems (NeurIPS)
Transactions on Pattern Analysis and Machine Intelligence (TPAMI)
ECCV European Conference on Computer Vision
Symposium on Geometry Processing (SGP)
ACM SIGGRAPH
ACM Transactions on Graphics (TOG)
SIGGRAPH Asia

Honors & Awards

Co-written and awarded Huawei Research Grant	2024
MCM scholarship, Indian Institute of Technology, Roorkee	2012-2014
IMPPRS MS scholarship, International Max Planck Research Schools	2016

Skills

Programming	Python, MATLAB, C++
Frameworks	NumPy, Pandas, PyTorch, SciPy, TensorFlow
Toolbox	Linux, emacs, org, git, tmux, zsh