Gopal Sharma

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Current Position

Postdoctoral Researcher, *The University of British Columbia*, Vancouver 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: Subhransu Maji and 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 Sanja Fidler and Kangxue Yin on 3D self-supervised learning) 2021
Research Intern, *Adobe*, San Jose (with Radomír Měch and Siddhartha Chaudhuri on neural shape reconstruction) 2019
Research intern, *KAUST* (with Bernard Ghanem on object tracking) 2015

Research Interests

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

Publications [Google Scholar: 0.4k+ citations and an h-index of 9]

2024

1. *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)**

2. *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

3. *Volumetric Rendering with Baked Quadrature Fields*
   Gopal Sharma, Daniel Rebain, Andrea Tagliasacchi, and Kwang Moo Yi
   Arxiv 2023

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

5. *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
   Arxiv 2023

2022

6. *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**)

7. *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

8. *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

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

2020

10. *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

11. *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

12. *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

13. *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

14. *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

15. *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

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

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