Gopal **Sharma**

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Work Experience

University of British Columbia *Vancouver, BC, Canada*
Postdoctoral Fellow *2022 - PRESENT*

Education

University of Massachusetts, Amherst *Amherst, MA, USA*
PhD in Computer Science (GPA: 3.95 / 4.0) *2016 - 2022*

Indian Institute of Technology (IIT), Roorkee *Roorkee, India*
B.Tech. in Electrical Engineering (GPA: 8.6 / 10.0) *2012 - 2016*

Publications

Conference Papers

- *Unsupervised Semantic Correspondence Using Stable Diffusion.* Eric Hedlin, **Gopal Sharma**, Shweta Mahajan, Hossam Isack, Abhishek Kar, Andrea Tagliasacchi, Kwang Moo Yi. ArXiv 2023.
- MvDeCor*: Multi-view Dense Correspondence Learning for Fine-grained 3D Segmentation.* **Gopal Sharma**, Kangxue Yin, Or Litany, Evangelos Kalogerakis, Subhransu Maji and Sanja Fidler. In 2020 IEEE/CVF European Conference on Computer Vision (ECCV) 2022.
- SurFit*: : Learning to Fit Surfaces Improves Few Shot Learning on Point Clouds.* **Gopal Sharma**, Bidya Dash, Matheus Gadelha, Aruni RoyChowdhury, Marios Loizou, Evangelos Kalogerakis, Liangliang Cao, Erik Learned-Miller, Rui Wang and Subhransu Maji. Computer Graphics Forum 2022.
- *ParSeNet: A Parametric Surface Fitting Network for 3D Point Clouds .* **Gopal Sharma**, Difan Liu, Evangelos Kalogerakis, Subhransu Maji, Siddhartha Chaudhuri and Radomír Měch. In 2020 IEEE/CVF European Conference on Computer Vision (ECCV).
- *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. In 2020 IEEE/CVF European Conference on Computer Vision (ECCV).
- *Search-Guided, Lightly-supervised Training of Structured Prediction Energy Networks.* Amirmohammad Rooshenas, Dongxu Zhang, **Gopal Sharma** and Andrew McCallum. In 2019 Conference on Neural Information Processing Systems (NeurIPS).
- *Learning Point Embeddings from Shape Repositories for Few-Shot Semantic Segmentation.* **Gopal Sharma**, Evangelos Kalogerakis and Subhransu Maji. In 2019 International Conference on 3D Vision (3DV).
- *CSGNet: Neural Shape Parser for Constructive Solid Geometry.* **Gopal Sharma**, Rishabh Goyal, Difan Liu, Evangelos Kalogerakis and Subhransu Maji. In 2018 IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR).
- *Persistent Aerial Tracking system for UAVs.* Matthias Mueller, **Gopal Sharma**, Neil Smith and Bernard Ghanem. In 2016 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).

Journal Paper

- *Attention Beats Concatenation for Conditioning Neural Fields.* Daniel Rebain, Mark J. Matthews, Kwang Moo Yi, **Gopal Sharma**, Dmitry Lagun, Andrea Tagliasacchi. TMLR 2022
- *Neural Shape Parsers for Constructive Solid Geometry.* **Gopal Sharma**, Rishabh Goyal, Difan Liu, Evangelos Kalogerakis and Subhransu Maji. IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI).

Research Experience

Self-supervised learning for 3D shape segmentation *Nvidia, Toronto*
Research Internship *May-Sep 2021*

- Worked on self-supervised learning for 3D shape segmentation using contrastive learning for fine-grained semantic segmentation.

Parametric Surface Fitting *Adobe, San Jose, CA*
Research Internship *May-Aug 2019*

- Worked on parametric surface fitting for 3D point cloud. Developed differentiable pipeline to fit bspline surface patches to point cloud.

Learning Visual Programs *UMass*

Research Assistantship *2018*

- The aim of the project is to induce programs using neural networks for visual softwares like Photoshops, Blender, Maya etc. We have done preliminary expriments for Constructive Solid Geometry that can generate programs of large lengths.

Exploring LSTMs for shape recognition *UMass*

Research Assistantship *Sep 2016 Feb 2017*

- The aim of the project is to exploit the sequential information present in uniformly rendered images from 3D shapes. We used LSTMs for processing sequentially rendered images for 3D shape recognition and retrieval tasks.

Word recognition in natural scene images *IIIT*

Summer Internship *May July 2016*

- Developed algorithms based on CNNs and bidirectional LSTMs to detect and recognize words in unconstrained natural scenes.

Activity recognition and Object tracking *KAUST*

Summer Internship *May July 2015*

- **Persistent Object tracking:** Experimentally demonstrated persistent object tracking methodology for swarm of UAVs. Developed a novel algorithm (C++ and python) to use object proposals (BING) for object tracking, based on the existing object trackers.

Skills

- **Programming Languages:** Python, Matlab
- **Scientific Computing:** Pytorch, TensorFlow, Keras, Scipy, Scikit-Learn, OpenCV, Eigen, OpenMP
- **Tools:** Git, Emacs, LaTeX, Visual Studio
- **Courses:** Machine Learning, Intelligent Visual Computing, Probabilistic Graphical Models, Deep Learning, Reinforcement Learning, Mathematical Statistics, Convex Optimization.

Invited talks

MvDeCoR: Multi-view Dense Correspondence Learning for Fine-grained 3D Segmentation. *Zoom*

Jan 2022

- Invited talk at Google Brain.

ParSeNet: A Parametric Surface Fitting Network for 3D Point Clouds. *Zoom*

Oct 2021

- Invited talk at *3d Structure and Compositional Learning* workshop. ICCV 2021.

Fine-grained 3D shape co-segmentation via pixel-based contrastive learning. *Zoom*

Sep 2021

- Invited talk at Nvidia (Toronto).

Reinforcement learning for game programming. *Zoom*

Dec 2021

- *Game programming* course at UMass Amherst.

Unity Machine Learning Agents. *Zoom*

Dec 2020

- *Game programming* course at UMass Amherst.

CSGNet: Neural Shape Parser for Constructive Solid Geometry *Harvard University*

Dec 2018

- Invited talk at *New England Computer Vision Workshop*.

Academic services

Journal review

- IEEE TVCG (2019), IEEE TVCG (2020), IEEE TVCG (2021), SIGGRAPH (2022) and SIGGRAPH Asia (2023)

Conference review

- NeurIPS (2019), CVPR (2019), ECCV (2020), NeurIPS (2020), ICCV (2021) and NeurIPS (2021).

Awards

MCM scholarship *IIT Roorkee*
2012-2014

IMPRS fellowship – declined *MPI Saarbrücken*
2016

References

- Subhransu Maji (smaji@cs.umass.edu)
- Evangelos Kalogerakis (kalo@cs.umass.edu)

More references are available upon request.