

# Nitin Agarwal

## Research Interests

I am interested in problems lying at the intersection of 3D Deep Learning, Computer Vision and Computer Graphics, especially 3D reconstruction (from points/images), 3D scene understanding, 3D scene modeling (from RGB images), style transfer (on meshes/images) and shape analysis for various kinds of applications such as VR/AR, games, autonomous driving, virtual tours, etc.

## Education

- 2014 – Present **PhD in Computer Science**, *University of California, Irvine, CA.*  
Advisor Prof. Gopi Meenakshisundaram
- 2011 – 2013 **MS in Bioengineering**, *University of Washington, Seattle, WA.*  
Thesis *Quantification of DNA in cancer cells using 3D Optical Projection Tomographic Microscopy.*  
Advisors Prof. Eric J. Seibel (UW) & Prof. Anthony P. Reeves (Cornell University)
- 2006 – 2010 **BE in Electronics & Instrumentation**, *BITS, Pilani, Rajasthan, India.*

## Experience

- 2018 – Present **Research Assistant**, *Interactive Visualization & Graphics Lab (iGravi), UCI, Irvine, CA.*  
Working on reconstructing rich details on 3D meshes using Generative Models like VAE and GANs. Creating a dataset of high resolution, real 3D objects which have details. Designing & implementing various GraphCNNs architectures in Pytorch and analyzing their performance.
- June – Sept 2016 **Research Intern**, *Argonne National Laboratory, Lemont, IL.*  
Developed algorithms for multi-view reconstruction of small bugs with labels using lytro cameras. Traditional MVE problems require hundred's of images with small baselines. We digitized small bugs (from museums) and their multiple labels, using few images with wide baselines.
- 2014 – 2017 **Research Assistant**, *Interactive Visualization & Graphics Lab (iGravi), UCI, Irvine, CA.*  
Developed algorithms and tools for neuroanatomists to visualize their histology data. This involved registration of thin slices (with artifacts) to their corresponding atlas, 3D reconstruction of these slices, segmentation of neurons and computing their connectivity across slices.
- Sept 13 – July 2014 **Algorithm Developer**, *VisionGate, Inc., Phoenix, AZ.*  
Developed new methods of non-parametric feature selection in lung cancer cells to better target features which could be used as classifiers. Improved the current 3D segmentation for better feature assessment. Developed tools to increase the throughput of the entire imaging & classification pipeline.

## Technical Skills

- Languages Python, C++.
- Tools/Software Pytorch, Tensorflow, MATLAB, Mitsuba, OpenGL, OpenCV, Git, Shell Scripting.
- Design Tools Blender, Adobe Products (Photoshop, Lightroom & Dreamweaver)
- Operating Sys. Linux, MacOS, Windows.

## Journal & Conference Publications

- 3DV 2020 **Nitin Agarwal**, Gopi Meenakshisundaram. GAMesh: Guided and Augmented Meshing for Deep Point Networks. In International Conference on 3D Vision, 2020.

- PG 2020 Tomer Weiss, Ilkay Yildiz, **Nitin Agarwal**, Esra Ataer-Cansizoglu, Jae-Woo Choi. Image-Driven Style-Aware 3D Indoor Scene Curation. In Pacific Graphics, 2020.
- BMVC 2019 **Nitin Agarwal**, Sung-Eui Yoon, Gopi Meenakshisundaram. Learning Embedding of 3D models with Quadric Loss. In British Machine Vision Conference, 2019. **(Oral Acceptance, Top 4.6%)**
- WACV 2018 **Nitin Agarwal**, Nicola Ferrier, Mark Hereld. Towards Automated Transcription of Label Text from Pinned Insect Collections. In IEEE Winter Conference on Applications of Computer Vision, 2018.
- Neuroscience Methods **Nitin Agarwal**, Xiangmin Xu, Gopi Meenakshisundaram. Geometry Processing of Conventionally Produced Mouse Brain Slice Images. In Journal of Neuroscience Methods, 2018 **(IF-2.78)**
- eScience 2017 Mark Hereld, Nicola Ferrier, **Nitin Agarwal**, Petra Sierwald. Designing a high-throughput pipeline for digitizing pinned insects. In IEEE 13th International Conference on e-Science, Workshop on BigDig: High Throughput Digitization for Natural History Collections, 2017. **(Oral Acceptance)**
- ICVGIP 2016 **Nitin Agarwal**, Xiangmin Xu, Gopi Meenakshisundaram. Robust Registration of Mouse Brain Slices with Severe Histological Artifacts. In Indian Conference on Computer Vision, Graphics and Image Processing, 2016.
- MICCAI 2016 **Nitin Agarwal**, Xiangmin Xu, Gopi Meenakshisundaram. Automatic Detection of Histological Artifacts in Mouse Brain Slice Images. In International Conference on Medical Image Computing and Computer Assisted Intervention, Workshop on Medical Computer Vision: Algorithms for Big Data, 2016. **(Oral Acceptance)**
- EMBS 2014 **Nitin Agarwal**, Yiting Xie, Florence Patten, Anthony Reeves, Eric Seibel. DNA ploidy measure from individual cancer cells using three-dimensional image cytometry. In International Conference of the IEEE Engineering in Medicine and Biology Society , Special Topic Conference on Healthcare Innovation & Point-of-Care Technologies, 2014. **(Oral Acceptance)**
- JMI 2014 **Nitin Agarwal**, Alberto Biancardi, Florence Patten, Anthony Reeves, Eric Seibel. Three-dimensional DNA image cytometry by optical projection tomographic microscopy for early cancer diagnosis. In Journal of Medical Imaging, 2014. **(IF-1.1)**
- SPIE 2013 **Nitin Agarwal**, Alberto Biancardi, Florence Patten, Anthony Reeves, Eric Seibel. Quantification of relative chromatin content in flow cytometry standards using 3D OPTM imaging technique. In Proceedings of SPIE Medical Imaging, 2013.

## Awards & Honours

- 2019 **Travel Award**, BMVC. (1 in 7 awards)
- 2017 – 2018 **ICS Innovation Endowed Fellowship**, UC Irvine.
- 2017 **Best Demo Award** at CS Research Showcase, UC Irvine.
- 2016 – 2017 **Public Impact Fellowship**, UC Irvine.
- 2016 **Winner of Judge's Award** at Graduate Research Symposium.
- 2014 – 2019 **Dean's Fellowship**, including five years of full financial support, UC Irvine.

## Press Coverage

- Optics.org Cell-CT spots early signs of cancer in cell nuclei, Aug 2014. ►

## Professional Services

- Reviewer Pacific Graphics, Graphical Models, Transaction on Visualization & Computer Graphics (TVCG), Interactive 3D Graphics and Games (I3D), Transaction of Image Processing (TIP), Visual Computer, PLOS ONE, Bioinformatics, Neuroscience Methods, IEEE Computational Intelligence Magazine, Methods in Ecology & Evolution.
- Member ACM, MICCAI, IEEE.