

ANURAG RANJAN

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HIGHLIGHTS

Research Scientist at Apple working on Generative AI, 3D Geometry and Efficient Neural Nets.

NOTABLE WORKS

FaceLit. The most photorealistic 3D GAN with a physical model of geometry and light[†].

Pointersect. A neural renderer with point-cloud primitive with that does not require per-scene optimization.

FastViT. The fastest vision transformer on an iPhone[†].

MobileOne. The fastest neural network on an iPhone[†].

NeuMan. A NeRF representation of animatable humans embedded in a scene.

Hypersim. Largest photoreal synthetic data of indoor scenes[†].

Convolutional Mesh Autoencoders. First work to apply convolutions on meshes.

SpyNet. Fastest and smallest neural network for Optical Flow[†].

[†]at the time of release.

EDUCATION

Doctor of Philosophy, Max Planck Institute for Intelligent Systems 2016 - 2020

Thesis – Towards geometric understanding of Motion

Summa cum laude (*mit Auszeichnung*, with honors, ~top 5%)

Master of Science, University of British Columbia 2013 - 2015

Computer Science

Bachelor of Technology, National Institute of Technology, Karnataka 2009 - 2013

Electronics and Communications Engineering

EXPERIENCE

Research Scientist Jan 2020 onward
Apple Cupertino, CA

- Led research efforts in Neural Radiance Fields, Generative AI and efficient neural networks.
- Co-inventor of MobileOne and FastViT; fastest neural networks on iPhone, shipped across multiple products.
- Co-inventor of FaceLit, Neuman; state-of-the-art generative models for faces and humans using NeRFs.
- Co-developed Hypersim, most photorealistic and first large scale dataset released by Apple.

Research Intern Fall 2018
NVIDIA Westford, MA

- Developed *Competitive Collaboration*, a general framework that facilitates competition and collaboration between different networks so that they learn from each other.
- Demonstrated state-of-the-art results on joint unsupervised learning of depth, camera motion, optical flow and motion segmentation leading to a CVPR paper.

Research Intern Summer 2017
Facebook Menlo Park, CA

- Developed a patented method for unsupervised video segmentation.

Software Developer 2015
Mashup Machine Vancouver, Canada

RESEARCH COMMUNITY ENGAGEMENTS

Area Chair, British Machine Vision Conference (BMVC) 2021, 2022, 2023.

Area Chair, 3D Vision (3DV) 2024.

Area Chair, Winter Conference on Applications of Computer Vision (WACV) 2024.

Reviewer, CVPR, ICCV, NeurIPS, AAAI, TPAMI, IJCV.

PATENTS

Benjamin Ray, and *Anurag Ranjan*. Unsupervised video segmentation. 2019

PUBLICATIONS

FastViT: A Fast Hybrid Vision Transformer using Structural Reparameterization ICCV 2023
Pavan Kumar Anasosalu Vasu, James Gabriel, Jeff Zhu, Oncel Tuzel, and Anurag Ranjan.

FineRecon: Depth-aware Feed-forward Network for Detailed 3D Reconstruction ICCV 2023
Noah Stier, Anurag Ranjan, Alex Colburn, Yajie Yan, Liang Yang, Fangchang Ma, Baptiste Angles.

FaceLit: Neural 3D Relightable Faces CVPR 2023
Anurag Ranjan, Kwang Moo Yi, Jen-Hao Rick Chang, and Oncel Tuzel.

Pointersect: Neural Rendering with Cloud-Ray Intersection CVPR 2023
Jen-Hao Rick Chang, Wei-Yu Chen, Anurag Ranjan, Kwang Moo Yi, and Oncel Tuzel.

An Improved One millisecond Mobile Backbone CVPR 2023
Pavan Kumar Anasosalu Vasu, James Gabriel, Jeff Zhu, Oncel Tuzel, and Anurag Ranjan.

NeuMan: Neural Human Radiance Field from a Single Video. ECCV 2022
Wei Jiang, Kwang Moo Yi, Golnoosh Samei, Oncel Tuzel, and Anurag Ranjan.

LCS: Learning Compressible Subspaces for Adaptive Network Compression at Inference Time WACV 2023
Elvis Nunez, Maxwell Horton, Anish Prabhu, Anurag Ranjan, Ali Farhadi, and Mohammad Rastegari.

Token Pooling in Vision Transformers WACV 2023
Dmitrii Marin, Jen-Hao Rick Chang, Anurag Ranjan, Anish Prabhu, Mohammad Rastegari, and Oncel Tuzel.

Hypersim: A photorealistic synthetic dataset for holistic indoor scene understanding ICCV 2021
Mike Roberts, Jason Ramapuram, Anurag Ranjan, Atulit Kumar, Miguel Angel Bautista, Nathan Paczan, Russ Webb, and Joshua M Susskind.

MorphGAN: One-Shot Face Synthesis GAN for Detecting Recognition Bias BMVC 2021
Nataniel Ruiz, Barry-John Theobald, Anurag Ranjan, Ahmed Hussein Abdelaziz, and Nicholas, Apostoloff

GIF: Generative Interpretable Faces 3DV 2020
Partha Ghosh, Pravir Singh Gupta, Roy Uziel, Anurag Ranjan, Michael J. Black, and Timo Bolkart

Learning Multi-Human Optical Flow IJCV 2020
Anurag Ranjan, David T Hoffmann, Dimitrios Tzionas, Siyu Tang, Javier Romero, and Michael J Black

Learning to Dress 3D People in Generative Clothing CVPR 2020
Qianli Ma, Jinlong Yang, Anurag Ranjan, Sergi Pujades, Gerard Pons-Moll, Siyu Tang, and Michael J. Black

Attacking Optical Flow ICCV 2019
Anurag Ranjan, Joel Janai, Andreas Geiger, and Michael J Black

Competitive Collaboration: Joint Unsupervised Learning of Depth, Camera Motion, Optical Flow CVPR 2019
and Motion Segmentation
Anurag Ranjan, Varun Jampani, Lukas Balles, Kihwan Kim, Deqing Sun, Jonas Wulff, and Michael J Black

Capture, Learning, and Synthesis of 3D Speaking Styles CVPR 2019
Daniel Cudeiro, Timo Bolkart, Cassidy Laidlaw, Anurag Ranjan, and Michael J Black

Generating 3D faces using convolutional mesh autoencoders Anurag Ranjan, Timo Bolkart, Soubhik Sanyal, and Michael J Black	ECCV 2018
Learning human optical flow Anurag Ranjan, Javier Romero, and Michael J Black	BMVC 2018
Unsupervised learning of multi-frame optical flow with occlusions Joel Janai, Fatma Guney, Anurag Ranjan, Michael Black, and Andreas Geiger	ECCV 2018
Optical flow estimation using a spatial pyramid network Anurag Ranjan, and Michael J Black	CVPR 2017
Seeing Skin in Reduced Coordinates Debanga R Neog, Anurag Ranjan, and Dinesh K Pai	FG 2017
Interactive gaze driven animation of the eye region Debanga R Neog, João L Cardoso, Anurag Ranjan, and Dinesh K Pai	Web3D 2016
Gaze driven animation of eyes Debanga Raj Neog, Anurag Ranjan, João L Cardoso, and Dinesh K Pai	SIGGRAPH SCA 2015

AWARDS

Mitacs Globalink Graduate Fellowship A sum of CA \$70,000 over two years that supported tuition and living at The University of British Columbia, for Master of Science program.

Mitacs Globalink Fellowship A funded research exchange at Ecole Polytechnique de Montreal.

Prime Minister's Letter Letter of appreciation from the Canadian Prime Minister's office during my research exchange at Ecole Polytechnique de Montreal.