

# SIDDHANT RANADE

## RESEARCH SCIENTIST

### EXPERIENCE

#### Topaz Labs, Deep Learning Researcher

Dallas, TX | Jun 2023 – Present

- Developed, trained and launched data-driven video enhancement features (*PyTorch, C++*):
  - Automatic denoising, upscaling, and sharpening to improve clarity while retaining detail.
  - Fast, color-accurate SDR-to-HDR inverse tone-mapping for higher contrast and saturation.
- Built data ingestion and processing pipelines to create a categorized dataset of > 1M high quality videos. (*Python, Bash*)
- Productionized a frame interpolation model, increasing slow-motion by 2x. (*C++, FFmpeg*)
- Owned all the inference pipelines for frame interpolation. (*ONNX, TensorRT, CoreML, FFmpeg*)
- Contributed fixes to colorspace-correctness of video playback. (*C++, C, FFmpeg*)

#### Meta, Research Intern

Remote, USA | Aug 2021 – Mar 2022

- Developed novel algorithms for creating high-quality, labeled, human-centric 3D scenes using semantically decomposed neural radiance fields. (*Python, PyTorch, OpenCV*)

#### Meta, Research Intern

Remote, USA | May 2020 – Aug 2020

- Trained neural networks for human pose estimation in production. (*Python, PyTorch, OpenCV*)
- Diagnosed and resolved bugs in the original implementation, improving precision. (*TensorFlow*)

#### Amazon, Applied Scientist Intern

Sunnyvale, CA | May 2019 – Nov 2019

- Developed algorithms for single-view, unsupervised 3D human pose estimation. (*PyTorch*)
- Demonstrated an 18% improvement in joint articulation accuracy over the state-of-the-art.

#### Adobe Research, Research Intern

Seattle, WA | May 2017 – Aug 2017

- Published research on learning material-aware local descriptors for 3D shapes for tasks such as classification and material-aware retrieval using neural networks. (*Python, Caffe*)

### EDUCATION

#### University of Utah, PhD in Computing – Graphics

Aug 2017 – May 2023

- Dissertation: Inferring Shape and Appearance of 3D Scenes – Advances and Applications.
- School of Computing Department Fellowship, 2017-18.

#### IIT Bombay, B.Tech. in Engineering Physics / Computer Science

Jul 2013 – May 2017

- Thesis: Material Prediction for Untextured 3D Models from 2D Images.

### PATENTS AND PUBLICATIONS

- A. Mateus, **S. Ranade**, S. Ramalingam, P. Miraldo, "Fast and accurate 3D registration from line intersections constraints," *Int. J. Comput. Vis.*, 2023.
- **S. Ranade**, C. Lassner, K. Li, C. Haene, S.-C. Chen, J.-C. Bazin, S. Bouaziz, "SSDNeRF: Semantic Soft Decomposition of Neural Radiance Fields," *arXiv preprint arXiv:2212.03406*, 2022.
- S. Tripathi, A. Tyagi, A. K. Agrawal, **S. Ranade**, "Three-dimensional pose estimation," U.S. Patent 11 526 697, 2022.
- **S. Ranade**<sup>\*</sup>, X. Yu<sup>\*</sup>, S. Kakkar, P. Miraldo, S. Ramalingam, "Mapping of sparse 3D data using alternating projection," in *Proc. Asian Conf. Comput. Vis.*, 2020.
- S. Tripathi<sup>\*</sup>, **S. Ranade**<sup>\*</sup>, A. Tyagi, A. Agrawal, "PoseNet3D: Learning temporally consistent 3D human pose via knowledge distillation," in *Int. Conf. 3D Vis.*, 2020.
- H. Lin, M. Averkiou, E. Kalogerakis, B. Kovacs, **S. Ranade**, V. Kim, S. Chaudhuri, K. Bala, "Learning material-aware local descriptors for 3D shapes," *Int. Conf. 3D Vis.*, 2018.
- **S. Ranade**, S. Ramalingam, "Novel single view constraints for Manhattan 3D line reconstruction," *Int. Conf. 3D Vis.*, 2018.

✉ [contact@siddhantranade.com](mailto:contact@siddhantranade.com)

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### SERVICE

**Peer review for:** Int. Conf. 3D Vis., Indian Conf. Comput. Vis. Graph. Image Process., AAAI Conf. Artif. Intell., IEEE Int. Conf. Robot. Automat.

**Teaching assistant for:** Computer Graphics, Interactive Graphics, Signals & Systems

### TECHNICAL SKILLS

**Programming languages:** C++, Python, C, MATLAB, Bash, R

**Deep learning:** PyTorch, TensorFlow, Caffe, ONNX, TensorRT, CoreML

**Math:** NumPy, Eigen, CUDA, Gurobi

**Graphics and vision:** OpenGL, OpenCV, Kornia, FFmpeg, Vulkan

**Color science:** color models, color spaces, transfer functions.

**Video editing:** Adobe Premiere, DaVinci Resolve, VapourSynth

**General-purpose tools:**  $\LaTeX$ , Excel