Chinmay Talegaonkar

⌂ Website | ✉ ctalegaonkar@ucsd.edu | in LinkedIn | ○ GitHub | ☲ Google Scholar

EDUCATION

University of California, San Diego   San Diego, CA
Ph.D. in Electrical and Computer Engineering   *Sept 2022 – Present*
Advisor: Prof. Nicholas Antipa   GPA: 4.0/4.0

University of California, Los Angeles   Los Angeles, CA
M.S. in Electrical and Computer Engineering   *2019 – 2021*
Advisor: Prof. Achuta Kadambi   GPA: 4.0/4.0

Indian Institute of Technology, Bombay   Mumbai, India
B.Tech. in Electrical Engineering   *2015 – 2019*
Minor in Computer Science   GPA: 9.07/10.0
Advisor: Prof. Ajit Rajwade

WORK EXPERIENCE

Research Intern   *San Diego, CA*
Qualcomm AI   *June 2023 – Sept 2023*

- Developed a memory-efficient generalizable NeRF-like method to create human avatars from monocular videos. Achieved comparable accuracy to existing methods. *Patent Pending*
- Invented a point-based 3D scene representation for human modeling that reduces memory usage by 10x and training time by 100x respectively.
- Engineered an end-to-end pipeline to estimate SMPL mesh, and segmentation masks from videos.

Senior Deep Learning Engineer   *Mountain View, CA*
Intrinsic.ai   *May 2022 – Sept 2022*

- Led the development of a novel HDR fusion algorithm, resulting in higher pose estimation accuracy for difficult lighting scenarios.
- Implemented a deep learning-based feature extractor to improve stereo matching and point cloud generation from a multi-view camera setup.

Senior Deep Learning Engineer   *Palo Alto, CA*
Akasha Imaging - **acquired** by Intrinsic.ai (an Alphabet company) in May 2022.   *May 2021 – May 2022*

- Developed an end-to-end deep learning based multi-view pose estimation pipeline with more than 99% reliability and sub-millimeter accuracy. This led to the company's first product order.
- Engineered a synthetic data generation pipeline to generate training data for segmentation and keypoint estimation algorithms.
- Contributed to tools for ML Ops, CI/CD testing, pose evaluation frameworks, and data collection setups.

Deep Learning Software Intern   *Santa Clara, CA*
NVIDIA   *June 2020 – Sept 2020*

- Optimized CUDA kernels for backpropagation in 2D and 3D convolution layers in popular CNN architectures, resulting in 30% speedup.
- Implemented a linearized thread launching algorithm resulting in over 30 % speedup for 3D convolutions with low channel counts.
- Enabled complex valued convolution kernels in *CUTLASS* achieving more than 90% compute resource utilization.

AI/ML Compute DevTech Intern   *Bengaluru, India*
NVIDIA   *May 2018 – July 2018*

- Developed CUDA kernels for optimizing routing layer and back-propagation in capsule networks resulting in a 2x speedup
- Parallelized end-to-end implementation of *DBscan* using *CUTLASS* and *thrust* libraries for **NVIDIA Rapids** ↗ platform

Publications

Pose Estimation of Buried Deep-Sea Objects using 3D Deep Learning Models
Jerry Yan*, ***Chinmay Talegaonkar***, Nicholas Antipa, Eric Terrill, Sophia Merrifield
OCEANS Conference and Expositions, 2024. Paper ↗ Code ↗

Visual Physics: Discovering Physical Laws from Videos
Pradyumna Chari*, ***Chinmay Talegaonkar***, Yunhao Ba*, Achuta Kadambi
ICCP 2020 Poster, CVPR 2020 Tutorial. arXiv PrePrint ↗
Journal Version: *On learning mechanical laws of motion from video using neural networks.*
IEEE Access, 2023. Paper ↗

Compressive Phase Retrieval Under Poisson Noise
Chinmay Talegaonkar, Parthasarthi Khirwadkar, Ajit Rajwade
IEEE International Conference on Image Processing (**ICIP**) 2019. Paper ↗

Performance Bounds For Tractable Poisson Denoisers With Principled Parameter Tuning
Chinmay Talegaonkar, Ajit Rajwade
IEEE Global Conference on Signal and Information Processing (**GlobalSIP**) 2018. Paper ↗

Key Skills

Programming Languages: C & C++, CUDA, Bash, Python, MATLAB
Frameworks: Pytorch, OpenCV, scikit-learn, numpy, scipy, pandas, blender, mitsuba3, Slang.D
Development Tools: Github, Jenkins, Google Cloud, Docker

Research Projects

Exact Volume Rendering of 3D Gaussians   Aug 2024 - Present
Guide: Prof. Nicholas Antipa and Prof. Ravi Ramamoorthi

   Developed a method for fast, exact volume rendering of 3D Gaussians. Currently exploring potential applications in Computed Tomography.

Defocus Blur Rendering with 3D Gaussian Splatting   Jan 2024 - Present
Guide: Prof. Nicholas Antipa and Prof. Ravi Ramamoorthi

   Devised an approach for rendering 3D Gaussians with defocus blur. Demonstrated applications in novel view synthesis from blurry images.

Monocular Depth Diffusion Models with Defocus Cues   Jan 2024 - Present
Guide: Prof. Nicholas Antipa

   Developed a test-time optimization method leveraging lens blur to remove depth ambiguities in monocular depth diffusion models. The proposed approach also enables metric depth estimation through these models.

Novel View Synthesis in the Presence of Phase Optics   Sept 2022 - Dec 2022
Guide: Prof. Ravi Ramamoorthi

   NeRF-based view synthesis from sparse views captured using a microlens array Code ↗ Report ↗

Teaching Assistant

- Introduction to Quantum Physics   IIT Bombay, Fall 2016
- Software Systems Lab   UCLA, Winter 2020
- Reinforcement Learning   UCLA, Spring 2020
- Introduction to Computer Vision   UCLA, Winter 2021
- Computational Imaging   UCSD, Spring 2024