Shrisudhan **Govindarajan**

PhD student · Simon Fraser University

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Education

Simon Fraser University
Burnaby, Canada

Doctor of Philosophy in Computing Science — *September 2023 - Present*

- Cumulative Grade Point Average(CGPA): 4.33/4.33

Indian Institute of Technology, Madras
Chennai, India

Interdisciplinary Dual Degree in Mechanical Engineering(B.Tech) and Data Science(M.Tech) — *August 2017 - May 2022*

- Cumulative Grade Point Average(CGPA): 9.17/10
- Completed Bachelors with **honors**

Maharishi Vidya Mandir
Chennai, India

High School | PCM along with Computer Science — *March 2013 - May 2017*

- Percentage: 96.2%

Publications

Lagrangian Hashing for Compressed Neural Field Representations
ECCV, 2024

Shrisudhan Govindarajan, Zeno Sambugaro, Ahan Shabanov, Towaki Takikawa, Weiwei Sun, Daniel Rebain, Nicola Conci, Kwang Moo Yi, Andrea Tagliasacchi

Project page

Point Cloud Serialization for Efficient Surface Reconstruction
3DV, 2025 [Under Submission]

Zhen Li, Weiwei Sun, **Shrisudhan Govindarajan**, Shaobo Xia, Daniel Rebain, Kwang Moo Yi, Andrea Tagliasacchi

BANF: Band-limited Neural Fields for Levels of Detail Reconstruction
CVPR, 2024

Ahan Shabanov, **Shrisudhan Govindarajan**, Cody Reading, Lily Goli, Daniel Rebain, Kwang Moo Yi, Andrea Tagliasacchi

Project page

Stereo-Knowledge Distillation from dpMV to Dual Pixels for Light Field Video Reconstruction
ICCP, 2024

Aryan Garg, Raghav Mallampalli, Akshat Joshi, **Shrisudhan Govindarajan**, Kaushik Mitra

Synthesizing Light Field Video from Monocular Video
*ECCV, 2022[**Oral**]*

Shrisudhan Govindarajan, Prasan Shedligeri, Sarah, Kaushik Mitra

Project page

Research Experience

TetRad: Tetrahedral Radiance Field for fast ray-tracing
Vancouver, Canada

GRUVI lab, SFU | Advised by Prof Andrea Tagliasacchi — *April, 2024 - Present*

- Working on a tetrahedral primitive-based volumetric representation for 3D unbounded scenes.
- Also developing a novel ray-tracing technique that traces through the primitive at O(1) in comparison to O(log N) complexity with Optix.
- This work is to be submitted at CVPR 2025.

Lagrangian Hashing for Compressed Neural Field Representations [Project Page]
Vancouver, Canada

GRUVI lab, SFU | Advised by Prof Andrea Tagliasacchi — *September, 2023 - April, 2024*

- Proposed a hybrid-representation for neural fields combining the characteristics of fast training NeRF methods that rely on Eulerian grids (i.e. InstantNGP), with those that employ points equipped with features as a way to represent information.
- As the points are equipped with a field of influence, it can be interpreted as a mixture of Gaussians stored within the hash table.
- Proposed a regularizer that encourages the movement of our Gaussians towards regions that require more representation budget.
- This work is under review at ECCV 2024.

BANF: Band-limited Neural Fields for Levels of Detail Reconstruction [Project Page]

Vancouver, Canada

GRUVI lab, SFU | Advised by Prof Andrea Tagliasacchi

September, 2023 - January, 2024

- Proposed a simple modification so that one can obtain neural fields that are low-pass filtered, and in turn show how this can be exploited to obtain a frequency decomposition of the entire signal.
- This work is published at CVPR 2024.

Self-supervised light field synthesis from Monocular video [Project Page]

Chennai, India

Masters Thesis - Data Science, Computational Imaging lab, IIT Madras | Advised by Prof Kaushik Mitra

May 2021 - March, 2022

- Proposed a self-supervised learning approach to address the ill-posed problem of synthesize light field video from monocular video.
- Implemented an adaptive low-rank scene representation tailored efficiently for each scene based on the scene depth distribution.
- Proposed novel techniques to address the limitations of monocular inputs like lack of disocclusion information and difficulty in depth scale perception to synthesize high-quality light fields.
- This work is published as an oral paper at ECCV 2022.

Caching in DNNs - Speeding up Inference for similar inputs

Hyderabad, India

Research Internship, IIT Madras | Advised by Prof Pratyush Kumar

May 2020 - July 2020

- Implemented a Histogram-based hashing function which estimates key features from the deep neural network to produce build hash map.
- Implemented a memory and compute efficient ProtoNN module that compares hash maps with samples from training set in order to predict the class labels.
- Achieved a 2-3% boost in classification accuracy on CIFAR-10 and CIFAR-100 datasets while reducing the inference latency to 60% of the model.

Work Experience

Microsoft India R&D Pvt. Ltd.

Hyderabad, India

Data and Applied Scientist

July 2022 - August 2023

- In Microsoft Teams, for a given search, we see multiple entity suggestions, like People suggestions, Message suggestions, File suggestions, Calendar suggestions, and others. I worked on developing a ranking model to rank these entities based on their relevance to the searched query and past user interaction.
- Developed a new labeling system called APSAT which acts as a measure of relevance between the entities and query, and is estimated using the dwell time and suggestion's click rate.
- I also developed a ranker model that understands the user's past behavior variations and identifies a Hero answer(most clickable) for a given query.

Microsoft India R&D Pvt. Ltd.

Hyderabad, India

Data and Applied Scientist Intern

May 2021 - July 2021

- Developed an model for ranking suggestions for a query based on their relatedness and usefulness at an Enterprise-level setup.
- Extracted important features for a ranking algorithm from various suggestion providers using graphical representation algorithms.
- Implemented semi-supervised learning approach motivated by Generative Adversarial Network for training the ranking problem on a large scale sparsely labelled commercial search data.
- This work significantly outperformed the baseline model and is currently being used in the Microsoft Bing Work vertical.

AutoInfer Pvt. Ltd.

Bangalore, India

Machine Learning Engineer Intern

June 2020 - August 2020

- Developed a Generative Network inspired by Layout2Image algorithm to generate realistic documents from user-specified layouts.
- Developed an algorithm to render additional erosion, dilation, and noise effects to enhance the document's realism. Utilizing perspective projection, the rendered document is warped on various artificial backgrounds to resemble camera captured documents.
- Built an information extraction network inspired by LayoutLM algorithm to extract textual and image features for extracting table information.

Yamaha India Pvt. Ltd.

Chennai, India

Production Engineer Intern

June 2019 - July 2019

- Implemented a manufacturing procedure to optimize and semi-automate the assembly process for head cylinder used in Yamaha Z-ray.
- Developed 3D model of an easily transportable carrier for transporting assembled head cylinders between production lines.

Invited Talks

Mobile Intelligent Photography & Imaging Workshop(MIPI), ECCV 2022

Tel Aviv, Israel

Invited Talk on Synthesizing Light Field Video from Smartphones

October 2022

- This talk focuses on self-supervised learning technique to reconstruct light field(containing 3D information) video from simple smartphone camera configurations, namely monocular camera and stereo camera.
- Discussions on various novel techniques we developed to address the challenges associated with these camera configurations in an attempt to synthesize structurally and temporally consistent light field video were conducted.

Vision India, ICVGIP 2022 *Gandhinagar, India*

Invited Talk on Synthesizing Light Field Video from Monocular Video *December 2022*

- This talk focuses on self-supervised learning technique to reconstruct light field(containing 3D information) video from monocular camera.
- Discussion on limitations of monocular input sequences for light field synthesis task, like difficulty in occlusion handling and depth scale perception, and the novel techniques we proposed to address these challenges were conducted.

Achievements

2021	**Fellowship**, Qualcomm Innovation Fellowship, 2021-22	*India*
2021	**Fellowship**, Samsung IITM-Pravartak Undergraduate Fellowship, 2021-22	*India*
2021	**Ranked 27th across the world**, International Data Analytics Olympiad (IDAO)	
2018	**Represented IIT-Madras**, Inter IIT Tech Meet in Engineer's Conclave Event	*Mumbai, India*
2017	**National Top 0.1%**, AISSEC(High School Exam) in Physics and Mathematics	*India*
2017	**National Top 1%**, National Standard Examination in Chemistry, India	*India*
2017	**State Top 1%**, National Standard Examination in Physics, India	*India*
2016	**Among Top 33 candidates in State**, Regional Maths Olympiad, India	*India*

Extracurricular Activity

IIT Madras Institute Football team *Chennai, India*

Goalkeeper

References

Dr. Andrea Tagliasacchi *Burnaby, Canada*

Associate Professor, Dept. of Computing Science, SFU; Part-time Staff Research Scientist at Google DeepMind

- **Email**: taiya@theialab.ca

Dr. Kaushik Mitra *Chennai, India*

Assistant Professor, Dept. of Electrical Engineering, IIT Madras

- **Email**: kmitra@ee.iitm.ac.in

Dr. Pawan Baheti *Bangalore, India*

Senior Director of Engineering, Qualcomm India Pvt. Ltd.

- **Email**: pbaheti@qti.qualcomm.com