

Tejan Karmali

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Research Interests: Generative Models, Reinforcement Learning

🌐: tejank10.github.io | 🎓: Google Scholar

Education

Stanford University

PhD in Computer Science

GPA: 4.0/4.0

Sept 2024 - Present

Indian Institute of Science, Bengaluru

Master of Technology (Research) in Computational and Data Sciences

GPA: 8.7/10.0

2019 - 2022

National Institute of Techonlogy, Goa

Bachelor of Technology in Computer Science and Engineering

GPA: 9.12/10.00

2015 - 2019

Work Experience

Graduate Student - Stanford University

Mentor: Prof. Kayvon Fatahalian

Stanford, USA

Present

- RL agents to aid game development.

Research Engineer II - Avataar

Mentor: Dr. Sohil Shah

Bengaluru, IN

October 2023 - July 2024

- 3D Reconstruction from sparse-view images using large diffusion models and LRMs.

Pre-Doctoral Researcher - Google Research

Mentors: Dr. Varun Gulshan , Alex Wilson

Bengaluru, IN

April 2022 - May 2023

- Addressed the problem of producing high-resolution segmentation maps of agricultural fields from their low-resolution satellite imagery.

Thesis

Landmark Estimation and Image Synthesis Guidance using Self-Supervised Networks

Advisor: Prof. R. Venkatesh Babu

- Proposed techniques to leverage pretrained networks trained using Self-Supervised Learning (SSL) on large data to improve performance on discriminative (landmark estimation) and generative (image synthesis) tasks.
- Discovered the emergence of correspondence tracking property in SSL networks and used it to solve few-shot landmark estimation. [WACV 2022]
- Identified the correlation between problem of unnatural image generation in StyleGAN and their PPL scores. Proposed distilling intermediate features from SSL networks into the generator to improve the naturalness. This led to 16% improvement on PPL score across datasets. [ECCV 2022]

Publications

Conference Papers

- *Hierarchical Semantic Regularization of Latent Spaces in StyleGANs*
Karmali T. , Parihar R., Agrawal S., Rangwani H., Jampani V., Singh M., Babu R.V.
Published at the 17th European Conference on Computer Vision (**ECCV 2022**)
- *LEAD: Self-Supervised Landmark Estimation by Aligning Distributions of Feature Similarity*
Karmali T.* , Atrishi A.* , Harsha S.S., Agrawal S., Jampani V., Babu R.V.
Published at the 2022 IEEE/CVF Winter Conference on Applications of Computer Vision (**WACV 2022**)

- *NoisyTwins: Class-Consistent and Diverse Image Generation Through StyleGANs*
Rangwani H.*, Bansal L.*, Sharma K., **Karmali T.**, Jampani V., Babu R.V.
Published at the IEEE/CVF Conference on Computer Vision and Pattern Recognition, 2023 (**CVPR 2023**)
- *Improving GANs for Long-Tailed Data Through Group Spectral Regularization*
Rangwani H., Jaswani N., **Karmali T.**, Jampani V., Babu R.V.
Published at the 17th European Conference on Computer Vision (**ECCV 2022**)
- *Everything is There in Latent Space: Attribute Editing and Attribute Style Manipulation by StyleGAN Latent Space Exploration*
Parihar R., Dhiman A., **Karmali T.**, Babu R.V.
Published at the 30th ACM International Conference on Multimedia (**ACM MM 2022**)
- *Deep Implicit Surface Point Prediction Networks*
Venkatesh R., **Karmali T.**, Sharma S., Ghosh A., Babu R.V., Jeni L., Singh M.
Published at the 2021 IEEE/CVF International Conference on Computer Vision (**ICCV 2021**)

Workshop Papers

- *Fashionable Modelling with Flux*
Innes M., Saba E., Fischer K., Gandhi D., Rudilosso M.C., Joy N.M., **Karmali T.**, Pal A., Shah V.; **SysML at NeurIPS 2018**

Awards, Grants, & Honours

Facebook AI Research International Scholarship for DPhil at Oxford University (declined) 2023

Selected for International Computer Vision Summer School (ICVSS) at Milan, Italy 2023

Outstanding Reviewer at CVPR 2022

Travel grant for presenting poster at JuliaCon in London, UK 2018

2x Google Summer of Code recipient 2018-2019

Select Projects

Duckietown.jl (as part of JuliaLang in Google Summer of Code) May 2019 - Aug 2019

- Developed a differentiable self-driving car simulator to train driving agent via differentiable programming.

AlphaGo.jl (as part of NumFOCUS in Google Summer of Code) May 2018 - Aug 2018

- Developed a Julia package to train and play zero-sum board games using Alpha(Go)Zero algorithm.

Academic Service & Volunteering

Reviewer	CVPR 2024, ICLR 2024, NeurIPS 2023, CVPR 2023, CVPR 2022, WACV 2022, SPCOM 2022
Volunteer	ICML 2020, NeurIPS 2020, IISc EECS Symposium 2021
Teaching	Tutorials on Computer Vision in IISc-TalentSprint Executive M.Tech. programs in Deep Learning
Mentorship	Undergraduate Interns at Video Analytics Lab, IISc

Skills

Languages and Tools	C++, Python, Julia, L ^A T _E X, Git, Docker, Linux
Libraries and Softwares	Tensorflow, PyTorch, OpenCV, Diffusers