Vikram Sandu

Contact Information

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Research Interests

- ◇ 3D Computer Vision
- ◇ Image and Video Signal Processing
- ◇ Machine Learning

Education

M.Tech - Indian Institute of Technology (IIT), Hyderabad Aug 2017 - May 2019
Dept of Electrical Engineering

- ◇ Thesis : 3D Reconstruction of the Human Face using Multi-stereo Camera Network
- ◇ Advisor : Dr. Soumya Jana
- ◇ CGPA : 9.06
- ◇ Recipient of MHRD scholarship (Govt of India)

B.Tech - University College of Engineering and Technology, Bikaner Aug 2012 - May 2016
Dept of Electronics and Communication Engineering

- ◇ Percentage: : 65
- ◇ GATE Score : 658 (AIR 1550)

Course Work

Mathematics	: Linear Algebra, Probability and Random Process, Linear and Non-Linear Optimization
Electrical	: Practical Challenges in Image Analysis, Optimization Methods in Machine Learning, Bayesian Data Analysis, Introduction to AI and ML

Work Experience

Indian Institute of Science (IISc) June 2024 - Present

- ◇ Role : Research Associate
- ◇ Lab : Vision and Image Processing (VIP)
- ◇ Domain : 3D Scene Representation
- ◇ Advisor : Dr. Rajiv Soundararajan
- ◇ Working on dynamic novel view synthesis methods based on NeRF, K-Planes, and Gaussian Splatting, with a focus on improving Gaussian Splatting based methods for complex and long-range motion scenarios.

Updated on May 3, 2025

- ◇ A paper based on this work has been recently submitted to ICCV 2025 and is currently under peer review.

Checko, IIT Kanpur Sep 2021 - Jan 2024

- ◇ Role : Computer Vision Engineer
- ◇ Domain : Anti-counterfeiting Technology
- ◇ Advisor : Dr. Deepak Gupta, IIT Kanpur
- ◇ Designed and implemented efficient computer vision and deep learning algorithms for real-time detection of labels embedded with 3D Physically Unclonable Functions (PUFs), along with real-time quality assessment of these labels during the production process.
- ◇ Leveraged Stable Diffusion-based data augmentation to boost the performance of lightweight classification models like SqueezeNet and MobileNet for classifying genuine 3D PUF labels from counterfeit or photocopied ones.

Tata Consultancy Services, Hyderabad Aug 2019 - Sep 2021

- ◇ Role : Software Engineer
- ◇ Worked on diverse projects across areas such as Machine Learning, AngularJS, Amazon Web Services (AWS), Power BI, and more.

LVPEI, Hyderabad Aug 2018 - Oct 2018

- ◇ Role : Intern
- ◇ Team : Research and Development
- ◇ Domain : Medical Augmented Reality
- ◇ Developed a patient-friendly multi-camera system for facial image acquisition and 3D reconstruction, enabling pre-operative planning and post-operative assessment for facial surgeries.
- ◇ We published this work here.

Academic Experience

Indian Institute of Technology (IIT) Hyderabad Aug 2017 - May 2019

- ◇ Teaching Assistant
- ◇ Advanced Digital Signal Processing - Aug 2018 semester

Computer Skills

Programming Languages	: Python, C, MATLAB
Platforms	: Windows, LINUX
Softwares	: LaTeX

Publications

- ◇ Thesis:
  - ➢ Vikram Sandu and Soumya Jana. 3d reconstruction of the human face using multi-stereo camera network. *IITH Archive*, 2019. [Link]
- ◇ Conferences:
  - ➢ Roopak Tamboli, Vikram Sandu, and Soumya Jana. Novel hybrid teleophthalmology: Technological case for oculofacial surgery. In *9th Annual IEEE Global Humanitarian Technology Conference, GHTC, 17-20 October 2019, Seattle, United States*, 2019. [Link]

Projects

Distributed optimization in Multi-agent System.

- ◇ Course Project for "Optimization Methods in ML"
- ◇ This project was aimed to optimize a global function formed by a sum of local functions, using only local communication and local computation. Building upon Nesterov gradient descent, We proposed a weight sharing strategy among the local agents that leads to a better convergence rate and sub-optimality. [Link]

Diffusion Models: PyTorch Implementation and Benchmarking

- ◇ Research Project at Checko
- ◇ Implementation, Training, and Benchmarking of the following Diffusion Models from the scratch in PyTorch.
- ◇ Denoising Diffusion Probabilistic Models (DDPM) [Link]
- ◇ Diffusion models beat gans on image synthesis. [Link]

CommonLit - Evaluate Student Summaries

- ◇ Kaggle Competition
- ◇ In this Kaggle competition, the objective was to train a language model to assess summaries written by students in grades 3 to 12 for a given prompt.
- ◇ I proposed a simple Data pre-processing approach to incorporate contextual information from the prompt text into summaries before feeding them into the transformers. We got bronze medal in this competition. [Link]

Research paper Implementations and Benchmarking

- ◇ Implemented and benchmarked several research papers from scratch in PyTorch.
- ◇ Check the provided links below to view the implementations corresponding to each paper.
- ◇ Chien-Yao Wang, Alexey Bochkovskiy, and Hong-Yuan Mark Liao. Yolov7: Trainable bag-of-freebies sets new state-of-the-art for real-time object detectors. *arXiv preprint*, 2022. [Link]
- ◇ Aaron van den Oord, Oriol Vinyals, and Koray Kavukcuoglu. Neural discrete representation learning. *Advances in Neural Information Processing Systems (NeurIPS)*, 30, 2017. [Link]
- ◇ Mingxing Tan and Quoc Le. Efficientnet: Rethinking model scaling for convolutional neural networks. In *Proceedings of the 36th International Conference on Machine Learning (ICML)*, 2019. [Link]
- ◇ Ashish Vaswani, Noam Shazeer, Niki Parmar, Jakob Uszkoreit, Llion Jones, Aidan N Gomez, Łukasz Kaiser, and Illia Polosukhin. Attention is all you need. In *Advances in Neural Information Processing Systems (NeurIPS)*, 2017. [Link]

Language Modeling: A Digestible Walkthrough

- ◇ Medium Blog
- ◇ In this blog, I have consolidated insights from various sources on language modeling, presenting them in a clear and structured manner for easier understanding. [Link]