SARTHAK VORA

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EDUCATION

University of California, Los Angeles (UCLA)   **Expected Date: March 2025**
Master of Science in Electrical and Computer Engineering

Indian Institute of Technology (IIT) Madras, Chennai, India   **June 2023**
Bachelor of Technology in Electrical Engineering   **CGPA 8.98/10**

SKILLS

- Programming Languages - Python, C, Linux, MATLAB, Verilog
- Frameworks – PyTorch, TensorFlow, OpenCV, Numpy, Pandas, Scikit-Learn
- Other skills – Git, Problem-Solving, Teamwork, Adaptability

PROFESSIONAL EXPERIENCE

Resilience Business Grids (RBG.AI), Coimbatore, India   **June 2023 – August 2023**
Artificial Intelligence Intern

- Integrated *Segment-Anything (SAM)* with *SegFormer* model for improved Floorplan Image segmentation.
- Utilized OpenCV's contour detection method to transform segments within the semantic map into polygons.
- Crafted a 3D model of the FloorPlan Image in Blender by extruding walls and objects from 2D polygons.

Vision and AI Lab (VAL), Indian Institute of Science (IISc) Bangalore, India   **June 2022 – March 2023**
Research Intern – Computational and Data Science (CDS) Department

- Modelled the latent space of *StyleGAN2* with a Denoising Diffusion Model to generate attribute variations.
- Generated a dataset of attribute edit directions by encoding synthetic image pairs into the *W+* latent space.
- Improved FID metric by 3.7 units on average across hairstyle, eyeglass, and smile attributes in *FFHQ* dataset.

PUBLICATIONS

- "Exploring Attribute Variations in Style-based GANs using Diffusion Models", *NeurIPS 2023 Diffusion Workshop Proceedings, **NeurIPS 2023** (under review)*
- "3D-ADAP: Advancing Object Detection through 3D-Aware Placement Augmentation", *Proceedings of the **AAAI** conference on Artificial Intelligence, **2024** (under review)*

PROJECTS

Road Scene Completion with Geometry-Aware 3D Vehicle Placement
Vision and AI Lab (VAL), Indian Institute of Science (IISc) Bangalore, India

- Designed a VAE placement module on *MonoDTR* backbone for learning dense 3D bounding box distribution.
- Developed an augmentation strategy for localizing plausible locations leveraged as sparse input distribution.
- Achieved road scene completion by rendering copy-paste cars at sampled box locations in the original scene.
- Showcased 22.6% improvement in Average Precision (AP_{40}) metric on *KITTI3D* Object Detection benchmark.

Learning Projections from Single Photon Cameras (SPC) for Stereo Depth Estimation
Undergraduate Thesis, Guided by Prof. Kaushik Mitra (IIT Madras) and Prof. Mohit Gupta (UW Madison)

- Formulated a software-defined projection technique to estimate depth from SPC photon cube at low light.
- Incorporated exposure bracketing into *ACVNet* by selectively using multiple exposures for depth prediction.
- Reduced D1 error by nearly 2% with learned-mask aided video compressive projection over multi-exposure.

Model Pruning: Lottery Ticket Hypothesis

- Trained a lightweight model M1 and Resnet18 on CIFAR-10 dataset to perform model pruning in PyTorch.
- Observed that iteratively pruned models with 40-80% sparsity were able to re-achieve original performance.
- Concluded that iterative pruning has better model generalizability and better accuracy on the validation set.

EXTRACURRICULAR ACTIVITIES

- Acted as the Co-Head of The Fifth Estate 2021-22, Official Student News Body of IIT Madras. Co-led a team of 5 members to conduct surveys and present them as institute newsletters.
- Facilitated a Prototyping session for nearly 30 participants from SQIL NGO (Non-governmental organization).