# 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, Matplotlib
- Other skills – Git, Critical-Thinking, Problem-Solving, Collaborative

## 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***
- "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*

- Collaborated with two researchers to design a VAE-based placement module for dense 3D bounding boxes.
- Designed 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 projection method for estimating depth using deep stereo networks with SPC photon cube.
- 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.

**3D BlobGAN: Enhancing Generative Models for Controlled 3D Scene Generation**

- Enhanced *BlobGAN* framework to support 3D blobs in latent space, enabling controlled 3D scene generation.
- Conducted experiments with the *PatchGAN* Discriminator to ensure consistent generation of multiple views.
- Independently synthesized top and front view for *CleVr* dataset by projecting volumetric blob distributions.

## 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).