

# Shrikant Arvvasu

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## Experience

### University of Michigan, Laboratory of Dr. Hun-Seok Kim

Ann Arbor, MI

#### Research Assistant (Computer Vision and LiDAR Perception)

May 2023 - Dec 2025

- Developed a **temporal-sensor-fusion** pipeline using a transformer backbone to process NuScenes LiDAR scans and camera frames, combining past detected boxes with LiDAR points, simulating **real-time constraints** in autonomous vehicle setups.
- Designed experiments validating the applicability of several hypotheses in training 3D object detection models by incorporating known and unknown parameters in the experiment.
- Coordinated with a team of doctoral researchers and a professor and maintained a detailed record of all experiments, pitfalls and discussed improvements.
- Finetuned the state of the art BEVFusion for 3D bounding box detection by only utilizing **50%** of the lidar beams, achieving a mAP of 0.601 and NDS of 0.63 on **NuScenes dataset** using subsampled point clouds.
- Developed novel diffusion sampling algorithms for inverse imaging problems, enhancing the quality and fidelity of the samples of **latent diffusion models**, achieving an FID score of 37.2, **an improvement of 17.2%** over the baseline model.

### Skylark Labs

Dover, DE

#### Machine Learning Intern (Representation Learning and Computer Vision)

June 2023 - August 2023

- Designed a caching mechanism using a pre-trained RegNet model to achieve a **recall of 65% in self-learning** new categories by storing **multi-scale quantized features** to recognize pre-trained classes.
- Improved the accuracy of the detector by 12% on detecting novel classes by training a detector with vector-quantized features.

### SixSense Corporation

Jalan Besar, Singapore

#### Computer Vision Intern (Automatic Augmentation and Multiclass Classification)

January 2022 - April 2022

- Trained a stochastic automatic augmentation framework based on **Fast AutoAugment** on a ResNet50 model to techniques for CIFAR-100 and ImageNet.
- Improved the average accuracy of the detector model by 2.3% by integrating the AutoAugment as a plugin-augmentation module for the company's defect detection dataset.

## Independent Projects

### Autolabelling Driving Scenes in Cityscapes using DiNO and Segment Anything

November 2024

- Automated dataset labeling using Grounded-SAM, tuning parameters through extensive experiments involving data cleaning and pseudo labeling.
- Reported 0.26 mAP-mask on YOLOv11-Seg for semantic segmentation of road markings, validating the model's robustness under minimal manual supervision.
- Packaged a TensorRT-based C++ inference pipeline for road-marking segmentation, enabling optimized deployment on Jetson boards.

### Translating Cartoon to Natural Images using Stable Diffusion

November 2023

- Implemented an image-to-image translation system from cartoon Tom and Jerry images to real cat and mouse images using diffusion models.
- Implemented a Stable Diffusion utilizing BLIP-based text guidance to translate cartoon images to real-like images, achieving an FID score of 46.32 comparing the real-ness of the images generated.

### Block-Based Compressed Sensing for Natural Images and Videos

January 2023

- Innovated a block-based compressed sensing approach for natural images and videos, leveraging deep learning inspired by the insights from the paper "Video Compressed Sensing Using a Convolutional Neural Network."
- Trained the model and achieved a compression factor of 0.1 on non-keyframes of videos of KITTI Dataset.

## Technical Skills

**Languages/OS:** Python, C, C++, Cuda, MATLAB, Shell Scripting, Linux, ROS

**Developer Tools:** OpenCV, SLURM, Git, Open3D, Docker

**Machine Learning Tools:** Pytorch, Pytorch-Lightning, MMDetection3D, Pandas, TensorRT

**Technologies/Concepts:** Deep Learning, Image Processing, Point Cloud Processing, 3D Computer Vision, Lidar-Voxel Algorithms, Sensor Fusion in AV systems, Generative AI, Diffusion Models

Education

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<b>University of Michigan</b> <i>Master of Science in Electrical and Computer Engineering</i> <i>Specialization: Signal &amp; Image Processing and Machine Learning</i>	<b>Ann Arbor, Michigan</b> <i>2022 – 2024</i> <i>GPA: 3.97/4.0</i>
<b>National Institute of Technology Karnataka</b> <i>Bachelor of Technology in Electronics and Communication Engineering</i> <i>Honors: Machine Learning and Signal Processing</i>	<b>Karnataka, India</b> <i>2018 – 2022</i> <i>GPA: 3.87/4.0</i>