

SUSHRUTH NAGESH

[linkedin.com/in/sushruthn](https://www.linkedin.com/in/sushruthn) \diamond github.com/sushruthn96 \diamond sushruthn96.github.io

Google Scholar : [Link](#)

+1(858) 405-5871 \diamond Mountain View, CA

EDUCATION

Master of Science, University of California, San Diego 2019 - 2021
Major - Intelligent Systems, Robotics and Control. GPA - 3.86/4
Dept - Electrical and Computer Engineering

Bachelor of Engineering, Sri Jayachamarajendra College of Engineering 2014 - 2018
Major - Electrical and Computer Engineering GPA - 9.44/10
Class Rank - 10 out of 150

SKILLS

Programming Languages	Python, C++, Java
Python Libraries	NumPy, OpenCV, matplotlib, SciPy, Pandas, Scikit-learn
Tools	Git, AWS, Linux, Jupyter, PyCharm, Eclipse
Deep Learning frameworks	Pytorch, Tensorflow

EXPERIENCE

Ford Motor Company *Palo Alto, CA*
Senior Perception Research Engineer Apr 2023 - present

- Researched and developed a perception neural network for lane and object detection up to 200 meters
- Developed an in-house neural network framework for all Machine learning projects at Ford to use
- Designed and implemented scaling and distributed computing support for the in-house framework to train and validate neural network models on TB's of data
- Implemented and tested the onboard inference pipeline for high speed object and lane detection as part of future Blue Cruise releases

Perception Research Engineer July 2021 - Mar 2023

- Researched and developed point cloud-based 3D LIDAR object detection model for Ford autonomous shuttle. Optimization of the model using tensorrt and custom CUDA kernels.
- Implemented data augmentation for images using NeRF based scene rendering and sparse depth map.
- Designed and developed Bayesian filtering based object tracking and sensor fusion algorithm for automatic vehicle marshalling system to be deployed at Ford manufacturing plants.
- Developed multi camera end-to-end vehicle pose estimation from keypoints using non-linear optimization to improve auto labeling capability for vehicle marshalling system.

Jabra (Altia Systems Inc) *Cupertino, CA*
AI Intern Mar 2021 – Jun 2021

- Built a binary whiteboard segmentation model to be deployed on Jabra Panacast 50 camera system. Wrote a tool to render synthetic meeting room images dataset using API's from a third-party vendor.

AI Intern Jun 2020 – Sept 2020

- Researched and developed a real-time SSD based body and face detection model to run on Jabra PanaCast 180° camera system. Over 25 % speed improvement and around 4 points mAP improvement was obtained.
- Auto mixed precision training and optimization including filter pruning and quantization were investigated.

- Designed and wrote a benchmarking and quality measurement tool to be used company-wide to measure performance and inference statistics of a given object detection model on different target devices.

Mercury Health

Deep Learning Intern

San Diego, CA

Feb 2020 - Jun 2020

- Developed and deployed single image human action detector system to AWS Sagemaker cloud machine-learning platform. Transfer learning techniques to leverage existing CNN models like Resnets and VGG nets was used.
- Improving the accuracy of DNN based sequence human action detector model by tuning the hyper parameters including manipulating the variance of synthetic dataset using ZCA, background subtraction and introducing gaussian noise.
- Developed visualization tools to analyze feature maps at different network stages. PCA, T-SNE, KNN, covariance shift based methods were utilized.

Hewlett Packard Enterprise

Systems Software Engineer

Bengaluru, India

Jul 2018 - Jul 2019

- Worked on SSL certificate-based authentication of connections and secure data exchange between different resource modules, network and storage managers which maintain a datacenter.
- Designed and developed a web application using Django framework for developers to request and get assigned virtual machines on demand. In the background a pool of VM's are maintained and synched to the network using API calls to VMware vSphere client.

Software Intern

Jan 2018 - Jun 2018

- Wrote an open source python package which automated the process of downloading, verifying and uploading CRL's through REST API's to HPE OneView resulting in reduction of time from hours to seconds. ([Link](#))

Vigyan Labs Innovation Pvt Ltd

Computer Vision Intern *

Mysuru, India

Sept 2017 - Dec 2017

- Automated energy meter reading system using edge, line and contour detection algorithms for analog meters and ResNet-50 based learning model for digit detector was developed. 97.3 % classification accuracy for digits and 90 % accuracy for analog meters was obtained. [* Undergrad thesis project] ([Link](#))

PUBLICATIONS

- **S Nagesh***, S Mishra*, S Manglani, G Mills, P Chakravarty, and G Pandey. Look both ways: Bidirectional visual sensing for automatic multi-camera registration. ([Link](#)) (**Closing the loop on localization - IROS 2023**). * Equal Contribution
- S A Deevi, C Lee, L Gan, **S Nagesh**, G Pandey, S Chung. RGB-X Object Detection via Scene-Specific Fusion Modules. ([Link](#)) (**WACV 2024**)
- S Shrivastava, X Zhang, **S Nagesh**, A Parchami. DatasetEquity: Are All Samples Created Equal? In The Quest For Equity Within Datasets. ([Link](#)) (**Out Of Distribution Generalization in Computer Vision - ICCV 2023**)
- G Kouros, S Shrivastava, C Picron, **S Nagesh**, T Tuytelaars. Category-Level Pose Retrieval with Contrastive Features Learnt with Occlusion Augmentation. ([Link](#)) (**BMVC 2022**)
- G Kouros, M Wu, **S Nagesh**, S Shrivastava, P Chakravarty, T Tuytelaars. Ref-DVGO: Reflection-Aware Direct Voxel Grid Optimization for an Improved Quality-Efficiency Trade-Off in Reflective Scene Reconstruction. ([Link](#)) (**Transparent and Reflective objects In the wild Challenges - ICCV 2023**)
- W Li, **S Nagesh**, S Shrivastava, N Barnes. Supervised Masked Modeling for Data-Limited LiDAR Semantic Segmentation. (Link will be updated once accepted for publication).(Submitted to **CVPR 2024**)
- **S Nagesh**, S Rajesh, A Baig, S Srinivasan. Domain Adaptation for Object Detection using SE Adaptors and Center Loss. 2021. ([Link](#)) ([arXiv](#))
- **S Nagesh**, A Baig, S Srinivasan, A Rangesh, M Trivedi. Structure Aware and Class Balanced 3D Object Detection on nuScenes Dataset. 2020. ([Link](#)) ([arXiv](#))

PATENTS FILED

- **S Nagesh**, S Shrivastava, P Chakravarty. Multi camera end-to-end vehicle pose estimation using non-linear optimization. 2021. (US Filed, Appl No: 17/745920. Germany Filed, Appl No: 102023112542.7. China Filed, Appl No: 202310515363.8)
- S Mishra, **S Nagesh**, P Chakravarty. Extrinsic Calibration of distributed cameras using Monocular Visual Odometry. 2022. (US Filed, Appl No: 17/815252. Germany Filed, Appl No: 102023119534.4. China Filed, Appl No: 202310885755.3)
- **S Nagesh**, S Shrivastava. 2D-aided 3D Perception Network. 2023. (US Filed, Appl No: 18/489263)

PAPER REVIEWS

- CVPR 2024 - Reviewed **6** papers
- ICRA 2024 - Reviewed **1** paper
- IROS 2023 - Reviewed **1** paper
- Journal of Autonomous Vehicles and Systems (ASME) - Reviewed **3** papers
- IEEE Transactions on Automation Science and Engineering - Reviewed **1** paper
- Neurips 2023 - Reviewed **2** papers
- ICRA 2022 - Reviewed **1** paper

PROJECTS

Unsupervised subspace clustering of human faces

UC San Diego

Guide: Prof An Cheolhong

Developed an auto encoder-based model to mimic the self-expressive property of face subspaces. Used spectral clustering to group faces. High 80 % clustering accuracy on UC San Diego ORL dataset was achieved.

Visual Inertial SLAM

UC San Diego

Guide: Prof Nikolay Atanasov

Built a 2D map of the environment and trajectory of the car using Extended Kalman Filter based visual and inertial measurement sensor fusion. Camera perspective projection based EKF update and IMU kinematics based EKF predict steps were used.([Link](#))

Image Captioning

UC San Diego

Developed a CNN encoder and LSTM decoder-based sequence model to generate image captions. Experiments based on optimizers, word embeddings and different type of RNN's were carried out.([Link](#))

Modernization and GDP

UC San Diego

Team Lead

Analyzed GDP as an indicator of socio-economic factors of a country. Data analysis and visualization through scatter, bubble and box plots using Pandas, matplotlib was carried out.([Link](#))

VM Rental System

Hewlett Packard Enterprise

As part of a hackathon at HPE, designed a Web application using Django framework for developers to request and immediately get VM's on demand. In the background a pool of VM's are maintained and monitored using API calls to VMware vSphere client.

RECOGNITION

- Employee of the month - Ford Motor Company (Nov 2021)
- Letter of Excellence - Hewlett Packard Enterprise (Jan 2019)
- Finalist - Texas Instruments India Innovation Challenge (2017-18) ([Link](#))
- Finalist - Intel India IOT challenge (2018)

RESEARCH LAB

Graduate Student Researcher

UC San Diego CHEI Lab

3D reconstruction of historical monuments using Structure from motion techniques at UC San Diego Culture and Heritage Initiative (CHEI) Lab. Explored 3 point absolute pose estimation for robust reconstruction.

TEACHING

Graduate Teaching Assistant

UC San Diego

- MATH 10A - Basic Calculus under Prof Benson Au in winter 2021
- CSE 151B - Deep learning under Prof Gary Cottrell in Fall 2020
- PHYS 1CL - Modern Physics Lab under Prof Phil Tsai in Spring 2020
- MATH 11 - Introduction to Probability & Statistics for Data Science under Prof F. Hammock in winter 2020

MISCELLANEOUS

- Session Chair - **Ford AI/ML conference 2023**
- Panelist - Your Internship is Over, What Do You Do Next 2023?. **IEEE Industry HUB Silicon Valley**