SAKSHI KAKDE

sakshi@terpmail.umd.edu | (+1)240-714-0043 | GitHub: sakshikakde | LinkedIn: Sakshi Kakde | Website: sakshikakde | San Francisco, CA, USA

Domain skills: 3D Reconstruction, Robot Perception, Computer Vision, Sensor Fusion, Mapping, Localization, Deep Learning, Artificial Intelligence

EDUCATION

University of Maryland, College Park *01/2021 - 12/2022*

M.Eng. Robotics | CGPA: 3.87/4 | *Roles: Teaching Assistant for CMSC426 (Computer Vision) and ENPM673 (Perception for Robotics). Courses: Foundations of Deep Learning, Numerical Optimization, Perception, Planning and Controls for Robotics, Software Development.*

Visvesvaraya National Institute of Technology, India *07/2014 - 05/2018*

B. Tech. Electrical and Electronics | CGPA: 8/10 | *Roles: Core team member of IVLABS.*

SKILLS

Programming Languages: Python, C++, MATLAB

Libraries and Tools:, PyTorch, Pytorch3D, TensorFlow, Open3d, OpenCV, ROS, Git, pytest

Deep Learning Architectures: Transformers, Diffusion Models, **Ne**ural **R**adiance **F**ields (NeRF), **V**ision **L**anguage **M**odels.

WORK EXPERIENCE

Fyusion/Cox Auto Inc. | **Senior Machine Learning Engineer** *San Francisco, California (03/2026 - Present)*

- Automated mask data annotation pipelines using dense feature-matching techniques based on **DINO**.
- Exploring **RL-based** fine-tuning self-supervised training for image feature matching using **epipolar constraints** as a reward.
- Deployed **keypoint detectors** for camera/light-panel corners to add spatial constraints for camera calibration.

Fyusion/Cox Auto Inc. | **Machine Learning Engineer** *San Francisco, California (09/2023 - 03/2026)*

- Automated camera calibration by deploying an ALIKED + LightGlue image feature matcher, removing the need for manual 3D-marker setup.
- Generated 3D car meshes from sparse point clouds using **Diffusion** + **S**igned **D**istance **F**unction methods.

Quidient | **AI/ML Engineer** *Columbia, Maryland (02/2023 - 09/2023)*

- Developed **NeRF**-based light field estimation for indoor environments.
- Combined physics-based rendering with NeRF to reconstruct complex, non-Lambertian surfaces.

Apple, Technology Development Group | **Research Intern** *Sunnyvale, California (05/2022 - 08/2022)*

- Estimated camera pose via semantic cues using hybrid classical + deep learning methods.
- Designed novel loss function leveraging **perspective-3-points + distance transforms**.
- Trained semantic NeRF models for scene geometry learning.
- Implemented inverse NeRF pose estimation, improving pose accuracy from weak initial guesses.

The Hi-tech Robotic Systemz Ltd. | **Research Engineer** *Gurugram, India (06/2018 - 05/2020)*

- Implemented **Normal Distribution Transform** matching for localization on large-scale 3D maps.
- Designed **sensor fusion system** (GPS, IMU, LiDAR) with Kalman filters, reducing velocity noise by ~40%.
- Built a dynamic **map-loading server**, improving localization system efficiency by ~50%.

PROJECTS

Vision-Language Model for Auto-Labeling - Finetuned *SegZero* with **GRPO** for automated damage detection from text descriptions.

Face Reconstruction from a Single Image - Integrated parametric 3D face models (e.g., FLAME) with monocular depth estimation to reconstruct 3D facial geometry from a single RGB image.

Forkast (StanfordXR Hackathon) - VR food menu application using Snap Spectacles and interactive XR UI. *(devpost)*

Video Classifier Interpretability - Applied Temporal Saliency Rescaling for spatiotemporal feature attribution. *(GitHub)*

Face Swap - Built DL + classical hybrid face-swapping pipeline (Delaunay Triangulation, Thin Plate Spline, PMRN). *(GitHub)*

SfMLearner - Unsupervised depth + ego-motion estimation from monocular sequences. (*GitHub*)

Structure from Motion - Reconstructed 3D scenes + camera poses via triangulation & nonlinear optimization. (*GitHub*)

AutoPano - Panorama stitching with classical homography + DL-based HomographyNet. (*GitHub*)

PUBLICATIONS & PATENTS

- Patent: **Generalized Scene Reconstruction and Appearance Modeling** (US 20230281955A1), *Sept 2023*.
- Patent: **Humanoid Robot** Granted Indian Patent Number 517158, *filed on May 05 2017*.
- Paper: **OrumBot** Origami-based Deformable Robot Inspired By Umbrella Structure, *Nov 2018 (link)*