Kaivalya Shah

Specializing in Computer Vision for Robotics and ROS Development
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Education

- **Pandit Deendayal Energy University (PDEU)** — Gandhinagar, Gujarat, India
  Bachelor of Technology in Computer Science & Minor in Robotics; CGPA: 8.7 — *July 2022 – Present*

Experience

- **Sastra Robotics (Startup), IITGN** — Gandhinagar, India
  Computer Vision Intern — *Sep 2024 – Present*
  - **Robot Grasping Technique**: Developing and optimizing vision-based AI models on Jetson edge devices, integrating inference pipelines, and enhancing real-time robotic perception systems.
- **IITGN Robotics Lab** — Gandhinagar, India
  Research Intern under Prof Harish PM. — *May 2024 – Jul 2024*
  - **Computer Vision**: Led projects on 6D pose estimation and 3D reconstruction using advanced computer vision techniques.

Projects

- **VisionEdge Stack (Server - client : SDK + UI)**: A scalable vision inference stack with a Jetson Orin NX-powered server, SDK for seamless integration, and a web-based UI for real-time monitoring and validation of AI-driven vision modules.
- **Live Grasp Detection For multiple Objects**: Efficient 6-DoF Grasp Generation in Cluttered Scenes with realsense depth camera with docker.
- **Object Physical Property Detection**: Implemented algorithms to detect and analyze object physical properties for robotic applications.
- **6DOF Live Pose Estimation and Tracking**: Developed a high-speed ROS package for live pose estimation using depth cameras.
- **Novel 3D Reconstruction (NeRF + LoFTR)**: Designed a pipeline for accurate 3D object reconstruction using NeRF and LoFTR models.
- **Multi-Purpose Differential Drive Robot**: Built a versatile ROS2 package integrating SLAM, RGBD vision, and point cloud generation with YOLO and Midas capabilities .

Skills

- **Hands-On:** Edge Device Optimization, Computer Vision, NeRF, LoFTR, LLM, ViT, CLIP
  Libraries: Asyncio, Flask, PyTorch, TensorFlow, Open3D, Keras, NumPy
  Languages: C++, Python, Java, R, MATLAB
- **Technologies:** ROS, Gazebo, SLAM, Nav2, CUDA, WebSockets
  Hardware: Jetson orin nx , Arduino, ESP32, Raspberry Pi
  Tools: Docker, Conda, Git
- **Theory:** Robotics and Control Systems
  CAD: Fusion 360