Kaustubh Prashant Sadekar

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Publications

Ph.D. Computer Science, Portland State University   *June 2022 - Present*
Department of Computer Science

B.Tech. Electrical Engineering, Pandit Deendayal Petroleum University   *August 2014 - May 2018*
School Of Technology Department of Electrical Engineering

Skills

Languages and libraries :	Python, C++, OpenCV, Open3D, PCL, PyTorch, PyTorch3D
Platforms :	Blender, Mitsuba3, Meshroom, ROS, Meshlab, Shining 3D, FARO Scene, Visual Studio, MATLAB, Arduino IDE
Hardware :	Intel Realsense D345i, OAK-D, FARO Focus, EinScan Pro, NVIDIA Jetson Nano, ARM-STM32f4, Arduino, Raspberry-Pi

Experience

Portland State University   *June 2022 - Present*
Graduate Research Assistant At The Computational Imaging Lab   *PI: Prof. Atul Ingle*
- Designing power and data-efficient in-pixel compressed imaging algorithms for megapixel SPAD-based flash LiDARs.

Indian Institute of Technology Gandhinagar   *August 2021 - March 2022*
Senior Research Fellow At The Computer Vision Imaging and Graphics Lab   *PI: Prof. Shanmuganathan Raman*
- 3D reconstruction of cultural heritage sites using FARO terrestrial scanner and EinScan structured light scanner. Proposals for research grants.

Indian Institute of Technology Gandhinagar   *August 2020 - August 2021*
Junior Research Fellow At The Computer Vision Imaging and Graphics Lab   *PI: Prof. Shanmuganathan Raman*
- Point cloud and mesh post-processing pipelines for structured light 3D scans. Custom photogrammetry pipeline for 3D reconstruction.

LearnOpenCV.com   *August 2019 - April 2022*
Contributing Author (remote work)   *Dr. Satya Mallick*
- Authored several technical articles explaining fundamental concepts of classical computer vision and 3D computer vision. % Author Profile

Indian Institute of Technology Bombay   *May 2019 - August 2020*
Research Associate At The Autonomous Robots and Multi-robot Systems (ARMS) Lab   *PI: Prof. Leena Vachhani*
- Streaming and surveillance system for spherical robots using fisheye camera. Created OmniCV - library for omnidirectional cameras.% Read Docs

Publications

Shadow Art Revisited: A Differentiable Rendering Based Approach   *WACV 2022*
Kaustubh Sadekar, Ashish Tiwari, Shanmuganathan Raman | % Project Page % Paper

LS-HDIB: A Large Scale Handwritten Document Image Binarization Dataset   *ICPR 2022*
Kaustubh Sadekar, Ashish Tiwari, Prajwal Singh, Shanmuganathan Raman |% Project Page% Paper

TreeGCN-ED: Encoding Point Cloud using a Tree-Structured Graph Network   *ArXiv*
Prajwal Singh, Kaustubh Sadekar, Shanmuganathan Raman | % Paper

Major Projects

Simulating Single Photon Cameras for Supervised Depth Estimation
To Be Open Sourced % Project Page
- Physics-based modeling of SPAD sensor measurements simulating the effect of photon randomness, laser characteristics, and ambient light.

Affordable Stereo Camera
To Be Open Sourced % Project Page
- Stereo camera with USB webcams. Supporting software for stereo calibration, multiple depth estimation algorithms, and RGB-D data processing.

Implementation of Kinect Fusion Algorithm For 3D Reconstruction
To Be Open Sourced % Project Page
- Vectorized, GPU-accelerated implementation of Iterative Closest Point (ICP) algorithm and TSDF Fusion algorithm using PyTorch.

OmniCV - Library for omnidirectional cameras
Open Sourced Code And Documentation Available On GitHub % Read Docs % Code
- ROS compatible library with different models of omnidirectional cameras (C++ and Python support). CI-CD using GitHub actions.

Cyclops - A Spatial AI-based Assistant for Visually Impaired
OpenCV Spatial-AI 2020 round 1 winners % link | Group members: Malav Bateriwala, Vishruth Kumar % Project Page
- Detects query objects with accurate depth estimates using Luxonis OAK-D and guides the user with audio feedback. RaspberryPi used as SoC.