Siddharth Katageri

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Machine Learning Researcher and Engineer with 3+ years of experience in machine learning, deep learning, generative AI, robotics, multi-view geometry, and optimization.

EDUCATION

International Institute of Information Technology, Hyderabad (IIIT-H) Aug 2021 - Aug 2024
Masters by Research, Computer Science and Engineering, GPA: 8.57/10

KLE Technological University, Hubballi Jul 2017 - Jun 2021
B.Eng. in Computer Science and Engineering, GPA: 8.66/10

EXPERIENCE

○ **TCS Research, Kolkata**
Researcher - Visual Computing and Emboddied AI Nov 2024 - Present
Working on spatial mapping towards interactable virtual 3D worlds (including geometry and texture) and enhancing user experiences in AR/VR environments. Using technologies like Generative AI, Differentiable rendering, 3D reconstruction to build solutions that work in real-world scenarios.

○ **International Institute of Information Technology, Hyderabad (IIIT-H)**
Research Fellow - Machine Learning Lab (MLL) Aug 2021 - Jul 2024
advised by **Prof. Charu Sharma** and **Prof. Kai Han**
Worked on 3D Computer Vision topics like representation learning in non-euclidean spaces, unsupervised domain adaptation, and learning human-scene interactions.

○ **KLE Technological University, Hubballi**
Research Intern - Center of Excellence in Visual Intelligence (CEVI) Mar 2021 - Aug 2021
advised by **Prof. Uma Mudenagudi**
Worked on the task of 3D shape decomposition into basic primitive shapes towards improving the performance of various 3D analysis tasks like classification and segmentation.

○ **Indian Institute of Technology, Delhi (IIT-D)**
Project Trainee Jun 2019 - Jul 2019
Worked with **Prof. Prem Kumar Kalra** and his Ph.D. students on a medical-related project called "Drilling Effectualness", which was a collaborative project with AIIMS, Delhi.

PUBLICATIONS

Synergizing Contrastive Learning and Optimal Transport for 3D Point Cloud Domain Adaptation
Siddharth Katageri*, Arkadipta De*, Chaitanya Devaguptapu*, VSSV Prasad, Charu Sharma, Manohar Kaul
Winter Conference on Applications of Computer Vision (WACV), 2024, **Oral**

Metric Learning for 3D Point Clouds Using Optimal Transport
Siddharth Katageri, Srinjay Sarkar, Charu Sharma
Winter Conference on Applications of Computer Vision Workshops (WACVW), 2024 - Pretrain

ABD-Net: Attention Based Decomposition Network for 3D Point Cloud Decomposition
Siddharth Katageri, Shashidhar Kudari, Akshay Gunari, Ramesh Tabib, Uma Mudengudi
International Conference on Computer Vision Workshops (ICCVW), 2021 - StruCo3D

PointDCCNet: 3D Object Categorization Network using Point Cloud Decomposition
Siddharth Katageri, Sameer Kulmi, Ramesh Tabib, Uma Mudengudi
Conference on Computer Vision and Pattern Recognition Workshops (CVPRW), 2021 - WiCV

PAST AND ONGOING PROJECTS

○ **Learning Human-Object Interactions in Real 3D Scenes** (*ongoing*)
Summary: We are interested in building systems that comprehend human motion and interactions in 3D environments and are actively working on it. Includes building a dataset using techniques like GenAI and optimization.

○ **3D Object Detection and Tracking in Outdoor LiDAR Scans.**
Summary: We worked on benchmarking various SoTA methods across multiple datasets for the task of outdoor 3D Object Detection/Tracking, as a preprocessing step to remove dynamic objects from 3D scans towards building

a 3D City Map. Project was carried out under the guidance of **Dr. Avinash Sharma** and **Dr. Charu Sharma**.

○ **Multi-view geometry based 3D reconstruction.**
Summary: Worked on multi-view stereo and camera calibration pipelines, relevant for 3D pose estimation and stereo-based reconstruction. Generated sparse and dense 3D reconstructions using structure-from-motion techniques.

○ **Vision-Based Techniques to Evaluate Effectualness of Micro Suturing by Trainee Neurosurgeons**
Summary: We designed and implemented a vision-based technique for automated evaluation and scoring of the micro-suturing performed by trainee neurosurgeons. This project was done in collaboration with AIIMS, Delhi.

○ **Mesh-Based Cloth Simulation**
Summary: Implemented and proposed slight upgrades to "Learning Mesh-Based Cloth Simulation with Graph Networks" as a part of a course project at IIIT-H.

TEACHING AND EVENTS

○ Delivered hands-on tutorials on 3D Vision during the 2022 and 2023 Summer School at IIIT Hyderabad, introducing foundational concepts and tools. (slides).

○ Organized workshops on Machine Learning and Computer Vision, fostering collaboration among 100+ participants at **Summer School on AI** in 2023 organized in IIIT Hyderabad.

○ An active volunteer in managing **NCVPRIPG-2019**, which was organized at KLE Technological University.

○ Active Volunteer in conducting workshops on Image Processing, Machine Learning, and Computer Vision conducted by CVG. (2019, 2020)

CERTIFICATIONS AND ACHIEVEMENTS

○ Attended a workshop on 3D Computer Vision at IIIT Hyderabad. (2020)

○ Attended CVG Winter Workshop on Image Processing, Machine Learning, and Neural Networks. (2020)

○ Completed multiple courses of *Deep Learning Specialization* authorized by deeplearning.ai, offered through Coursera.

○ Won multiple state and national level awards in the Abacus and Mental Math Championship. (*National rank: 65*)

TECHNICAL SKILLS

Languages: Python, C, C++
Framework: PyTorch, Scikit, OpenCV
Tools: Blender, MeshLab, Git, WandB
Topics: Deep Learning, Optimization, 3D Vision, Multi-view Geometry, Robotics, Generative AI, Muilti-modal Learning