NOBEL DANG

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EDUCATION

Clemson University | *Doctor of Philosophy in Computer Vision, Ph.D. (**GPA:** x / 4.0)* **SC, USA** | *(2023 -Present)*
- **Research Interest:** Novel View Synthesis, 3D Reconstruction, Localization, Foundational Models, Vision Language Models, Perception, Geometric Learning.
- **Coursework**: Computer Graphics, Linear and Nonlinear optimization.

New York University | *Master of Science in Computer Science (**GPA:** 3.97 / 4.0)* **NY, USA** | *(2021 - 2023)*
- **Coursework**: Computer Vision, Deep Learning, Machine Learning, Big Data, Cloud Computing, Information Visualization, Algorithms.

Guru Gobind Singh Indraprastha University | *B.Tech. in Computer Science & Engineering (**GPA:** 8.16 / 10)* **Delhi, India** | (*2016 - 2020*)
- **Coursework**: Artificial Intelligence, Machine Learning, Algorithms, Database Management Systems, Operating System, JAVA.

EXPERIENCE

VIPR, DEVCOM, CU *(Research Scientist)* **SC, USA | (***Aug 2023 – Present)*
- Developing hyperspectral-based foundation model with self-supervised learning.
- Developing VPR and localization techniques for autonomous AI.

AI4CE, NYU *(Research Assistant)* **NY, USA | (***Jun 2022 – Aug 2023)*
- Developing Computer Vision, Deep Learning and Robotics Perception methodologies to solve spatial reasoning and create dataset for autonomous driving for New York City.

Deep Learning, NYU *(Teaching Assistant)* **NY, USA |** *(Jan 2023 – May 2023)*
- Served as a Teaching Assistant in the Deep Learning course at NYU under Professor Chinmay Hegde.

Libsys Ltd *(Software Developer Intern)* **Gurugram, India** | (*Jun 2019 – Aug 2019)*
- Developed **hybrid application** for Library management system that uses RFID, using **Flutter**.

PUBLICATIONS

Co-VisiON: Co-visibility ReasONing on Sparse Image Sets of Indoor Scenes || *Arxiv*
- Developed Co-Vision benchmark, evaluating co-visibility reasoning of models across 1000+ indoor scenarios with sparse image set.
- Curated and open-sourced large-scale dataset using habitat-sim from iGibson and HM3D datasets by parallel processing.
- Introduced baselines for co-visibility reasoning; like traditional vision methods **(SIFT & RANSAC)**, contrastive methods **(SimCLR with ViT)**, place recognition **(with NetVLAD),** 3D reconstruction **(MV-DUSt3R)** and multimodal methods **(GPT4-v and/or SigLIP)** with highest **AUC of 0.63**.
- Designed and implemented Covis, a novel multi-view pure-vision baseline, with **AUC of 0.57** and narrowed the gap to proprietary VLMs.

Kinematics Estimation of Carpal Bones || *MS Thesis, Proquest*
- Evaluated and estimated kinematics from volumetric 4D MR sequences of the carpal wrist bones by generating Dense Displacement vector fields in a novel way and detecting pathology in wrist using geometric learning from motion patterns.
- Performed 3D-segmentations and regression to get smooth trajectories of the carpal bones in SE(3) manifold.
- Created template of volumetric frame sequences of carpal bones using ANTs and ITK-SNAP and transferred the rigid segmentations from a high-resolution static image to the dynamic image sequences.
- Performed a novel quasi rigid image registration between the volume sequences that maintains the rigidity of carpal bones, but the rest of volume is deformable with average DICE score **~ 0.9**.

Malaria Detection on Giemsa-Stained Blood Smears Using Deep Learning and Feature Extraction || *AISC 1087, Chapter-7, Springer*
- Detected malarial parasites in the Giemsa-stained blood smears using deep convolutional architecture and SVM with an **accuracy of 98.8%** and **F1-score of 0.9795.** Also, performed benchmarking with transfer learning on models like RESNET, VGGNet and DenseNet.

RESEARCH PROJECTS

Spatial-VPR || *Currently in progress AutoAI@Clemson *Present*
- Introducing new methodology that solves VPR task by combing multiple images to share information across them rather than individual image-based representation.
- Performed fundamental experiments with learnings from CroCo, CLIP, DIFT, MiDaS and DINOv2 to understand how they effect VPR task at scale.

Hyper-vision || *Currently in progress AutoAI@Clemson *Present*
- Aligning hyperspectral and RGB modality for scene understanding.

SKILLS

- 3D Reconstruction, View Synthesis, Scene Understanding, Visual Localization, Large Language Models (and VLMs), Geometric Learning, Perception