DEEPTI HEGDE

3D Computer Vision, Deep Learning

https://deeptibhegde.github.io

ABOUT ME

I am a third year PhD student advised by Vishal M Patel at the Vision and Image Understanding Lab in the Department of Electrical and Computer Engineering, Johns Hopkins University. I am interested in learning in limited-label scenarios and vision-language models for 3D scene understanding. I have previously worked on pointcloud refinement, image enhancement, and embedded intelligence.

EDUCATION

Johns Hopkins University *August 2020 - Present*
PhD, Department of Electrical and Computer Engineering

KLE Technological University *August 2016 - June 2020*
Bachelor of Engineering, School of Electronics and Communication

EXPERIENCE

Mitsubishi Electric Research Labs (MERL) June 2023- September 2023
Research Intern

Summer research internship working self supervised representation learning on LiDAR point clouds..

Mitsubishi Electric Research Labs (MERL) June 2022- August 2022
Research Intern

Summer research internship working on multi-modal domain generalization for 3D object detection using lidar and image data to address cross-dataset distribution shift in autonomous driving scenarios. Work submitted to a major computer vision conference.

Vision and Image Understanding Lab, Johns Hopkins University August 2020 - Present
Graduate Research Assistant

Research in the department of Electrical and Computer Engineering advised by Vishal M. Patel working on domain adaptation, domain generalization, and self-supervised learnign for 3D scene and shape understanding.

Samsung Research Institute, Bangalore November 2018- May 2019
PRISM Program

One year project collaboration with SRI, Bangalore on embedded computing intelligence and efficient implementation of the convolution operation for the ARM Compute Library

IIT, Guwahati June-July 2019
Research Intern

Summer internship working with Prabin K Bora in the Image Processing and Computer Vision Lab, IITG on the enhancement of images captured underwater towards improved structure-from-motion reconstruction of submerged heritage sites.

IIT, Delhi June-July 2018
Summer Intern

Summer internship working with Prem Kalra to demonstrate real-time relocalization of an agent by estimation of pose and trajectory of a camera at any given mapped location with a memory efficient relocalization algorithm capable of being run on 2GB RAM ARM Cortex A53 processor.

PUBLICATIONS

- CLIP goes 3D: Leveraging Prompt Tuning for Language-Grounded 3D Recognition, ***Deepti Hegde****, Jeya Maria Jose Valanarasu**, Vishal Patel*, ICCVW 2023
- Attentive Prototypes for Source-free Unsupervised Domain Adaptive 3D Object Detection, ***Deepti Hegde****, Vishal Patel*, WACV 2024
- Uncertainty-aware Mean Teacher for Source-free Unsupervised Domain Adaptive 3D Object Detection, ***Deepti Hegde****, Vishwanath Sindagi, Velat Kilic, A. Brinton Cooper, Mark Foster, Vishal Patel*, ICRA 2023
- Lidar Light Scattering Augmentation (LISA): Physics-based Simulation of Adverse Weather Conditions for 3D Object Detection, *Velat Kilic,* ***Deepti Hegde****, Vishwanath Sindagi, A. Brinton Cooper, Mark Foster, Vishal Patel*
- Refining SfM Reconstructed Models of Indian Heritage Sites, *T Santosh Kumar* ***Deepti Hegde****, Ramesh Tabib, Uma Mudenagudi*, - SIGGRAPH Asia 2020.
- ***Deepti Hegde****, Chaitra Desai, Ramesh Tabib, Uma Mudenagudi* Single Underwater Image Restoration, Oral Presentation - WiCV, ECCV 2020.
- ***Deepti Hegde****, Chaitra Desai, Ramesh Tabib, Ujwala Patil, Uma Mudenagudi, Prabin K Bora*,Adaptive Cubic Spline Interpolation in CIELAB Color Space for Underwater Image Enhancement, Oral Presentation - Best Paper Session, CoCoNet 2019
- ***Deepti Hegde****, Chaitra Desai, Ramesh Tabib, Ujwala Patil, Uma Mudenagudi, Prabin K Bora*, Adaptive Color Correction for Underwater Image Enhancement, International Conference on Computer Vision Workshops (ICCV 2019).

PROJECTS

Semantic Segmentation of MR Images for Brain Tumor Identification Propose and implemented a two branched variant of 3D U-Net which uses edge supervision to enforce learning of higher-level features such as the edges of tumors and the classes with fine structures.

Low Memory GEMM-Based Convolutions for Deep Neural Networks
Implementation of a convolution algorithm with reduced memory and computational complexity for inference of CNN models on low memory devices such as mobile phones, using the ARM Compute Library. Demonstrated reduced memory footprint of multi-channel, multiple kernel convolution as compared to standard deep learning library functions.

ARM NN Offline Graph Generation Study for Deep Neural Networks Reduce overhead of ARMNN runitme parsers and generation of offline ARMNN graph by developing a graph generator tool which generates ARMNN graphs using an efficient serialization library such as FlatBuffers. Built ARMNN SDK on an x86 machine. Joint collaboration with Samsung Research Institute Bangalore and KLE Tech.

Real-Time Multiple Person Recognition and Tracking for CCTV Camera Surveillance system for CCTV cameras which recognizes selected multiple target individuals and tracks in real time across multiple cameras, with detection, recognition, and kernel-based tracking modules. Winning project, Smart India Hackathon 2019. (Python)

ACADEMIC ACHIEVEMENTS

First place, Smart India Hackathon, Software Edition, for the project “Real-Time Multiple Person Recognition and Tracking for CCTV Camera” (Team Leader)

Certificate of Excellence, Samsung PRISM Program for contribution to the worklet ”Offline Graph Generation Study for Deep Neural Networks”