

DEEPTI HEGDE

3D Computer Vision, Deep Learning

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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 3D scene and shape understanding under limited supervision. I am currently working on domain generalization and zero shot recognition of 3D shapes. 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 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

- **Deepti Hegde**, Vishal Patel, Attentive Prototypes for Source-free Unsupervised Domain Adaptive 3D Object Detection, [under review]
- **Deepti Hegde**, Vishwanath Sindagi, Velat Kilic, A. Brinton Cooper, Mark Foster, Vishal Patel, Uncertainty-aware Mean Teacher for Source-free Unsupervised Domain Adaptive 3D Object Detection, [under review]
- Velat Kilic, **Deepti Hegde**, Vishwanath Sindagi, A. Brinton Cooper, Mark Foster, Vishal Patel, Lidar Light Scattering Augmentation (LISA): Physics-based Simulation of Adverse Weather Conditions for 3D Object Detection, [under review]
- T Santosh Kumar **Deepti Hegde**, Ramesh Tabib, Uma Mudenagudi, Refining SfM Reconstructed Models of Indian Heritage Sites, Poster - ACM SIGGRAPH Conference and Exhibition on Computer Graphics and Interactive Techniques - Asia 2020.
- **Deepti Hegde**, Chaitra Desai, Ramesh Tabib, Uma Mudenagudi Single Underwater Image Restoration, Oral Presentation - Women in Computer Vision Workshop, 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, Third International Conference on Computing and Network Communications (CoCoNet 2019), Trivandrum, Kerala
- **Deepti Hegde**, Chaitra Desai, Ramesh Tabib, Ujwala Patil, Uma Mudenagudi, Prabin K Bora, Adaptive Color Correction for Underwater Image Enhancement, Extended Abstract, International Conference on Computer Vision Workshops (ICCV 2019).
- **Deepti Hegde**, Ramesh Tabib, Uma Mudenagudi, Relocalization of Camera in a 3D Map on Memory Restricted Devices, 7th National Conference on Computer Vision, Pattern Recognition, Image Processing and Graphics (NCVPRIPG 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 runtime 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”