

# DEEPTI HEGDE

## 3D Computer Vision, Deep Learning

dhegde1@jhu.edu

### ABOUT ME

---

I am a second year PhD student advised by Dr. Vishal Patel at the Vision and Image Understanding Lab in the Department of Electrical and Computer Engineering, Johns Hopkins University where I work on 3D computer vision and deep learning. I currently work on 3D scene understanding for autonomous driving applications. I have previously worked on pointcloud refinement, image enhancement, and embedded intelligence.

### EDUCATION

---

#### Johns Hopkins University

*August 2020 - Present*

Ph.D Department of Electrical and Computer Engineering

#### KLE Technological University

*August 2016 - June 2020*

B.E, School of Electronics and Communication

### EXPERIENCE

---

#### Vision and Image Understanding Lab, Johns Hopkins University

August 2020 - Present

*Graduate Research Assistant*

Research in the department of Electrical and Computer Engineering on domain adaptive 3D object detection for scene understanding advised by Dr. Vishal Patel and in collaboration with Dr. Mark Foster.

#### Samsung Research Institute, Bangalore

November 2018- May 2019

*PRISM Program*

Project collaboration with SRI, Bangalore on embedded computing intelligence and efficient deep learning techniques over the course of two semesters.

#### IIT, Guwahati

June-July 2019

*Summer Research Intern*

On-campus internship under Dr. Prabin K Bora in the Image Processing and Computer Vision Lab, IITG. Worked on the underwater enhancement research project “Underwater Image Enhancement Using Adaptive Cubic Spline Interpolation in CIELAB Color Space”.

#### IIT, Delhi

June-July 2018

*Summer Intern*

On-campus internship under Dr. Prem Kalra and his PhD students working on the computer vision project “Relocalization of an Agent in 3D SLAM Generated Map”, to demonstrate real-time relocalization of an agent by estimation of pose and trajectory of a camera at any given mapped location with 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, arXiv 2021
- 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, arXiv 2021
- 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 (ICCVW 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”