

# DEEPTI HEGDE

## 3D Computer Vision, Deep Learning

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### EDUCATION

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#### Johns Hopkins University

Ph.D Department of Electrical and Computer Engineering

August 2020 - Present

#### KLE Technological University

B.E, School of Electronics and Communication

August 2016 - June 2020

### EXPERIENCE

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

Graduate Research Assistant

August 2020 - Present

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

PRISM Program

November 2018- May 2019

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

#### IIT, Guwahati

Summer Research Intern

June-July 2019

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

Summer Intern

June-July 2018

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

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- *T Santosh Kuamr* **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

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### Low Memory GEMM-Based Convolutions for Deep Neural Networks

I worked in a team of 2 to design and implement 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. We demonstrated reduced memory footprint of multi-channel, multiple kernel convolution as compared to standard deep learning library functions. Joint collaboration with Samsung Research Institute Bangalore and KLE Tech. (C++)

### ARM NN Offline Graph Generation Study for Deep Neural Networks

ARMNN has various runtime parsers for the various model formats such as Caffe, Tensorflow, ONNX, TFLite etc. To avoid this overhead during runtime, I worked in a team of 5 to parse the models and generate the ARMNN graph offline by developing a graph generator tool which generates ARMNN graphs using an efficient serialization library such as FlatBuffers. We successfully built ARMNN SDK on an x86 machine. Joint collaboration with Samsung Research Institute Bangalore and KLE Tech. (C++)

### Real-Time Multiple Person Recognition and Tracking for CCTV Camera

I led a team of 6 to design and develop a 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. Facial recognition is done using HOG features and image embedding using OpenFace. We were able to perform simultaneous tracking and recognition of multiple individuals across multiple cameras in real time. Winning project, Smart India Hackathon 2019. (Python)

## ACADEMIC ACHIEVEMENTS

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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”