Dikshit Hegde

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Understanding "***how human brain perceives three-dimensional space***" poses a significant challenge. I am PhD scholar at Computer Vision Image and Graphics Lab (CVIG), Indian Institute of Technology Gandhinagar (IITGN) under Prof Shanmuganathan Raman. My focus lies in developing methods for Learning Representation of Visual Data to enhance the interpretation of Real world mimicking Human perception. My goal is to advance the capabilities of a machine, enabling them to think, perceive and act with a human like understanding.

Research Interest

Unsupervised Learning | Geometric Learning | Learning Representation | 3D Data Processing | Categorization | Incremental Learning

Experience

09/2024 – 03/2025 **Research Fellow,** *3DVis | Indian Institute of Technology Jodhpur (IITJ)*
Understanding the Geometry of 3D Data, Radiance Fields, Human Modeling

06/2021 – 06/2025 **Research Fellow,** *CEVI | KLE Technological University*
Learning Representation of Data, Understanding the Geometry of 3D Data

10/2021 – 09/2024 **Technical Consultant,** *CEVI-SEED | KLE Technological University*
Support for building in-house annotation tools

09/2020 – 06/2021 **Software Engineer,** *MulticoreWare*
Human Pose Estimation

01/2020 – 08/2020 **Project Intern,** *MulticoreWare*
Human Activity Recognition

2019 (1 month) **Research Intern,** *Indian Institute of Technology, Delhi*
2018 (1 month) Categorization of Images towards 3D Reconstruction, Re-localization of a agent in a 3D Generated Map

Education

2025 – Present **Doctor of Philosophy in Computer Science and Engineering,**
Indian Institute of Technology Gandhinagar (IITGN)| Gandhinagar, India
Computer Vision, Deep Learning

2020 – 2016 **Bachelor of Engineering in Electronics and Communication,**
KLE Technological University | Hubballi, India
Machine Learning, Deep Learning, Signals and System ***(9.04 CGPA)***

2016 – 2014 **Pre-University Education,**
Vidyaniketan PU Science College | Hubballi, India
Physics, Maths, Statistics, Chemistry ***(94.3% PCMS)***

Skills

Python | C | PyTorch | Technical Writing | Linux | Presentation Skills

Courses and Certifications

Summer School **3D Vision Summer School,** *CVIT | IIIT Hyderabad*
Understanding, Interpreting and Processing of 3D Data and its algorithms such as Farthest Point Sampling, Ball Query, K-Nearest Neighbors, Implicit functions, Sign Distance Function on Point Clouds

Course **Deep Learning,** *NPTEL | IIT Madras (Online)*
Course outcomes an introduction to Deep Learning consist of Neural Networks, Backpropagation, Convolution Neural Network, Autoencoders, Generative algorithms.

Publications

CVPR-W 2024 — **LGAfford-Net: A Local Geometry Aware Affordance Detection Network for 3D Point Clouds**, *DLGC*
Ramesh Ashok Tabib, **Dikshit Hegde**, Uma Mudenagudi

ICCV-W 2023 — **DeFi: Detection and Filling of Holes in Point Clouds Towards Restoration of Digitized Cultural Heritage Models**, *e-Heritage*
Ramesh Ashok Tabib, **Dikshit Hegde**, Tejas Anvekar, Uma Mudenagudi

CVPR-W 2023 — **IPD-Net: SO(3) Invariant Primitive Decompositional Network for 3D Point Clouds**, *StruCo3D*
Ramesh Ashok Tabib, Nitishkumar Upasi, Tejas Anvekar, **Dikshit Hegde**, Uma Mudenagudi

IEEE PReMI 2023 — **AfforDrive: Detection of Drivable Area of Drivable Area for Autonomous Vehicles**
Mahek Jain, Guruprasad Kamat, Rochan B, Vinayak A B, **Dikshit Hegde**, Ujwala Patil

SIGGRAPH ASIA 2022 — **Metric KNN is All You Need**
Tejas Anvekar, Ramesh Ashok Tabib, **Dikshit Hegde**, Uma Mudenagudi

CVPR-W 2022 — **DA-AE: Disparity-Alleviation Auto-Encoder Towards Categorization of Heritage Images for Aggrandized 3D Reconstruction**, *IMW*
Dikshit Hegde, Tejas Anvekar, Ramesh Ashok Tabib, Uma Mudenagudi

CVPR-W 2022 — **VG-VAE: A Venatus Geometry Point-Cloud Variational Autoencoder**, *DLGC*
Tejas Anvekar, Ramesh Ashok Tabib, **Dikshit Hegde**, Uma Mudenagudi

ICVGIP 2021 — **Modelling Nuisance Classifier Towards Class-Incremental Learning of Crowd-sourced Data**
Ramesh Ashok Tabib, T Santoshkumar, **Dikshit Hegde**, Adarsh Jamadandi, Uma Mudenagudi

CoCoNet-W 2020 — **Deep Features for Categorization of Heritage Images Towards 3D Reconstruction**, *VisionNet*
Ramesh Ashok Tabib, **Dikshit Hegde**, T Santoshkumar, Srikar Hl, Mutturaj Harage, Chaitra Desai, Ujwala Patil, Uma Mudenagudi

NCVPRIPG 2020 — **Relocalization of Camera in a 3D Map on Memory Restricted Devices**
Deepti Hegde, **Dikshit Hegde**, Ramesh Ashok Tabib, Uma Mudenagudi

Capacity Building (Resource Person)

FDP — **ATAL Faculty Development Program (FDP)**, *KLE Technological University*
Conducted Hands on Session on Image Processing, Computer Vision, Machine Learning and its application in real world problems.

Summer School — **Summer School in Visual Intelligence**, *CEVI | KLE Technological University*
Trained students on Image Processing, Computer Vision, Machine Learning and its application in real world problems.

Tech Talk — **2D/3D Human Pose Estimation**, *CEVI | KLE Technological University*
Introduction to Human Pose Estimation, state-of-the-art methodology, and its application in real time

FDP — **Faulty Development Program on AR/VR**, *REVA University*
Conducted Hands on session on AR / VR using unity.

Projects

CEVI **Pipeline for Preserving the Heritage sites in Digital format using Crowdsourced Images (Sponsored),** *DST-IHDS*

Preserving heritage sites in digital format through creating a 3D models of sites for better presentation. 3D models are created through images collected through crowd. Curation and categorization of crowd sourced images for effective 3D reconstruction of models. I was privileged to contribute in these area through categorization, filtering and 3D reconstruction of data. Our work got published with the titles ***Deep Feature extraction, DA-AE for categorization and Modelling Nuisance classifier for class-incremental learning of crowdsourced data.*** I was also privileged to work on refinement of reconstructed 3d model where missing regions, noisy regions are included. This work was published with the title ***DeFi,*** where we concentrated on filling the missing regions.

CEVI **Shape Representation of 3D Data,** *AICTE-RPS*

Understanding a 3D model depends on understanding its composition and shape. I was privileged to work on this project and gain information about the intrinsic and extrinsic of a 3D model. Through ***Metric-KNN, VG-VAE, IPD-Net and LGAffordNet*** we decomposed the models compositionality, gather the semantical similar regions. This project helps professionals to mimic the real world Heritage sites to a CAD model towards Digital preservation.

SIH – HCL **Real-Time Multiple Person Recognition and Tracking for CCTV Cameras,**
Smart India Hackathon 2019 (Software Edition) | Winners

I was privileged to contribute in detection and tracking of multiple person through CCTV feeds. This was floated by HCL company focusing on criminals/thief recognition and tracking in highly dense crowded areas. We developed an algorithm which detects Human Face, recognizes the human from the database and tracking him using kernel based tracking.

Samsung SRIB **Data Encryption,** *Industry Collaboration*

Data Privacy is a major concern for a individual person. I was privileged to contribute in encrypting the data in a fashion that a learning algorithms can take a inference. We developed an learning based algorithm which encrypts the data and decrypts the encrypted data. We also validated the encrypted data by classifying them into their respective class.

Samsung SEED **Semi-Automated Annotation and Quality Check Tool,**
Industry Collaboration

I was privileged to contribute in building a Semi-automated annotation and a quality check tool, helping annotators for better annotations. Now a days there are too many dataset but there are few annotated dataset. Annotation is a major task in this domain for better learning and building of deep learning models.

References

Shanmuganathan Raman, *CVIG | Indian Institute of Technology Gandhinagar*

Professor and Head of Department of Computer Science and Engineering,
Professor at Department of Electrical and Electronics Engineering
shanmuga@iitgn.ac.in +91 743 300 9408

Uma Mudenagudi, *CEVI | KLE Technological University*

Dean of Research and Development, Professor at School of Electronics and Communications
Director of Center of Excellence in Visual Intelligence.
uma@kletech.ac.in +91 934 339 2667

Ramesh Ashok Tabib, *CEVI | KLE Technological University*

Assistant Professor at School of Electronics and Communications
Research Faculty at Center of Excellence in Visual Intelligence,
Operational Head of Student Ecosystem in Engineering Data (SEED) Collaboration with SAMSUNG SRIB.
ramesh_t@kletech.ac.in +91 984 471 2633

Declaration

I, declare the above data is appropriate according to my knowledge

Dikshit Hegde