

# Prajwal Kumar Singh

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## RESEARCH INTEREST

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Generative Networks, Image and Video Synthesis, 3D Shape Reconstruction, Graph Neural Networks, Multimodal, Brain Computer Interface (EEG), Neural Rendering and Representation Learning.

## EDUCATION

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<b>PhD in Computer Science,</b> PMRF Scholar, IIT Gandhinagar, Gujarat, India Advisor: Dr. Shanmuganathan Raman CGPA: 9.71/10.0	<i>Oct 2021 - Present</i>
<b>M.Tech. in Computer Science and Engineering,</b> IIT Gandhinagar, Gujarat, India Advisor: Dr. Shanmuganathan Raman CGPA: 8.89/10.0	<i>Jul 2019 - May 2021</i>
<b>B.Tech. in Computer Science and Engineering,</b> LPU, Punjab, India CGPA: 8.78/10.0	<i>Aug 2014 - May 2018</i>
<b>HSC [Class XII],</b> Kendriya Vidyalaya 39 G.T.C, Varanasi, U.P., India Percentage: 78.2/100	<i>Apr 2013 - Mar 2014</i>
<b>SSC [Class X],</b> Kendriya Vidyalaya 39 G.T.C, Varanasi, U.P., India Percentage: 8.6/10.0	<i>Apr 2011 - Mar 2012</i>

## THESIS

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<b>Master's Thesis:</b> Generating 3D Shapes and Images from The Embedding of Images and Text	<i>May 2021</i>
<ul style="list-style-type: none"><li>- This work is about generating images based on the embedding of given text and also generating 3D point cloud shapes based on the embedding of single view image.</li><li>- Another purpose of this work is to experiment with deep learning models that can generate information preserving embedding's for images and texts.</li></ul>	

## TEACHING EXPERIENCE

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<b>Probability, Statistics, and Data Visualization</b> (taught by Dr. Shanmuganathan Raman, IIT Gandhinagar) <i>Teaching Assistant</i>	<i>Spring 2023</i>
<b>Operating System</b> (taught by Dr. Abhishek Bichhawat, IIT Gandhinagar) <i>Teaching Assistant</i>	<i>Fall 2022</i>
<b>Deep Learning</b> (taught by Dr. Shanmuganathan Raman, IIT Gandhinagar) <i>Teaching Assistant</i>	<i>Spring 2022</i>
<b>Introduction to Computing</b> (Python Programming Course, IIT Gandhinagar) <i>Teaching Assistant</i>	<i>Fall 2019, Fall 2020, Winter 2021</i>
<b>Databases</b> (taught by Dr. Mayank Singh, IIT Gandhinagar) <i>Teaching Assistant</i>	<i>Spring 2021</i>

## EXPERIENCE

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### Junior Research Fellow

IIT Gandhinagar, Gujarat, India

May 2021 - Sep 2021

### Freelancer (GATE CSE)

Gradeup (Gradestack Learning Pvt Ltd)

May 2019 - Jun 2019

## TECHNICAL SKILLS

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**Programming Languages:** C, Python, C++, Matlab

**Database Language:** MySQL

**Software:** Blender, Git, Wireshark, Cisco Packet Tracer

**Tools and Libraries:** OpenCV, Numpy, Tensorflow, Matplotlib

## ACADEMIC PROJECTS

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### Graph Based Image Segmentation

Jun 2020 - Jul 2020

- This project is based on research paper "Efficient Graph-Based Image Segmentation" by Felzenszwalb et.al. Purpose of this project is to use traditional computer vision approach to solve the problem of image segmentation.

### Visual Object Tracking

Mar 2020 - Jun 2020

- This project is based on fully convolutional siamese network for object tracking research paper. Purpose of this project is to understand working of visual tracking network and find some new method or approach for object tracking.

### OpenCV Morse Code Solver

May 2018

- Designed an DFA algorithm that takes images pixel as input and convert it to characters if the input pixels are Morse code pixel.

## PUBLICATIONS (GOOGLE SCHOLAR PROFILE)

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### Conference paper

1. *EEG2IMAGE: Image Reconstruction from EEG Brain Signals* [Project Page]  
**Prajwal Singh**, Pankaj Pandey, Krishna Miyapuram, Shanmuganathan Raman  
(ICASSP 2023)
2. *APEX-NET: Automatic Plot Extractor Network* [Paper][Project Page]  
Aalok Gangopadhyay, **Prajwal Singh**, Shanmuganathan Raman  
(NCC 2022)
3. *LS-HDIB: A Large Scale Handwritten Document Image Binarization Dataset* [Paper]  
Kaustubh Sadekar, Ashish Tiwari, **Prajwal Singh**, Shanmuganathan Raman  
(ICPR 2022)

### Workshop paper

1. *DILIE: Deep Internal Learning for Image Enhancement* [Paper]  
Indra Deep Mastan, Shanmuganathan Raman, **Prajwal Singh**  
(VAQ Workshop, WACV 2022)

### Arxiv articles

1. *TreeGCN-ED: Encoding Point Cloud using a Tree-Structured Graph Network* [Paper]  
**Prajwal Singh**, Kaustubh Sadekar, Shanmuganathan Raman

### Under review

1. *Search Me Knot, Render Me Knot: Embedding Search and Differentiable Rendering of Knots in 3D*  
Aalok Gangopadhyay, Paras Gupta, Tarun Sharma, **Prajwal Singh**, Shanmuganathan Raman