

# Ankita Ghosh

[ankitaghosh9.github.io](https://github.com/ankitaghosh9)

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## EDUCATION

### ETH Zurich

2022–Present

MSc in Computer Science (Major in Visual and Interactive Computing)

*Relevant Coursework: Computer Vision, Computer Graphics, 3D Vision, Digital Humans*

### Manipal Institute of Technology

2018 – 2022

B.Tech in Computer Science and Engineering (Minor in Graphics and Visualization)

CGPA: 9.27/10

*Relevant Coursework: Digital Image Processing, Deep Learning, Augmented and Virtual Reality*

## RELEVANT RESEARCH WORK

[C1] Ankita Ghosh\*, Sahil Khose\*, Yogish S. Kamath, Neetha I. R. Kuzhuppilly, Harish Kumar J R, **Fovea Segmentation Using Semi-Supervised Learning**, *INDICON 2023* [ [paper](#) | [code](#) ]

[C2] Ankita Ghosh\*, Sahil Khose\*, Yogish S. Kamath, Neetha I. R. Kuzhuppilly, Harish Kumar J R, **Explainable Classification of Macular Degeneration Using Deep Learning**, *INDICON 2023* [ [paper](#) | [code](#) ]

[W1] Rakshit Naidu, Ankita Ghosh, Yash Maurya, Shamanth R Nayak, Soumya Snigdha Kundu, **IS-CAM: Integrated Score-CAM for axiomatic-based explanations**, *Responsible Computer Vision, CVPR 2021* [ [paper](#) | [code](#) ]

[W2] Ankita Ghosh\*, Sahil Khose\*, Abhiraj Tiwari\*, **Semi-Supervised Classification and Segmentation on Aerial Images**, *Tackling Climate Change with ML, NeurIPS 2021* [ [paper](#) | [code](#) | [demo](#) ]

[W3] V Manushree\*, Sameer Saxena\*, Parna Chowdhury\*, Manisimha Varma\*, Harsh Rathod\*, Ankita Ghosh, Sahil Khose, **Extraction of Color Information from Images for Generation of Colored-Sketches**, *ML for Creativity and Design, NeurIPS 2021* [ [paper](#) | [code](#) | [demo](#) ]

## EXPERIENCE

### Student Researcher, Computer Vision and Learning Group, ETH Zurich

March 2023 – Present

*Supervisor: Prof. Dr. Siyu Tang and Korrawe Karunratanakul*

*Zurich, Switzerland*

- Currently working on human motion generation from textual description in a two-person interaction scenario using **transformer-based diffusion models**.
- Semester Project: Human Motion Generation in 3D Scene using Diffusion Models**

### Research Intern, Spectrum Lab, Indian Institute of Science

January 2022 – July 2022

*Supervisor: Prof. Dr. Harish Kumar J. R. and Prof. Dr. Chandra Sekhar Seelamantula*

*Bangalore, India*

- B.Tech Thesis: Deep Learning-based Fundus Image Analysis for Diabetic Retinopathy Grading**

### Mitacs Research Intern, SIRRL, University of Waterloo

June 2021 – September 2021

*Supervisor: Prof. Dr. Moojan Ghafurian and Prof. Dr. Kerstin Dautenhahn*

*Ontario, Canada*

- Recipient of **Mitacs Globalink Research Internship**, Project: Emotion Recognition in a Humanoid Robot.
- Designed facial expressions for **Furhat** robot using **Facial Action Coding System**, developed a model that maps emotions to facial gestures, and implemented the computational model of **Affect Control Theory**.

### Research Assistant, Kumudha Health Tech. Pvt. Ltd.

November 2019 – November 2020

*Supervisor: Dr. Hareesha K S*

*Manipal, India*

- Rendered anatomical parts in a **virtual environment** using Oculus Rift, aided by 3D Slicer and Unity.
- Used Insight Toolkit and Visualization Toolkit to perform image processing operations like **registration and fusion on medical data**, and developed GUI for real-time operations on data using Qt Software.

## RELEVANT PROJECTS

### Leveraging Motion Imitation in Reinforcement Learning for Biped Character

May 2023

*Digital Humans Spring 2023 Course Project at ETH Zurich* [ [code](#) | [report](#) | [demo](#) ]

- implemented a reinforcement learning framework that can **imitate motion capture data** in a physically-based environment while incorporating **task objectives**.
- synthesized a sequence of motions using methods like **multi-clip concatenation** and **composite policy**.
- proposed a **residual policy network** that can leverage pre-trained agents and retarget to new characters.

## Semantic-MD: Infusing Monocular Depth with Semantic Signals

May 2023

3D Vision Spring 2023 Course Project at ETH Zurich [ [code](#) | [report](#) | [poster](#) ]

- explored different ways of integrating semantic signals to the input in the form of **semantic maps and borders**.
- performed **multi-task learning** to jointly estimate depth and semantic maps.
- conducted extensive **ablation studies** with different segmentation architectures and loss functions.

## Ray Tracing Graphics Project

December 2022

Computer Graphics Autumn 2022 Course Project at ETH Zurich [ [report](#) ]

- Implemented **functionalities** like image textures, normal mapping, environment map emitter, Disney BRDF, probabilistic progressive photon mapping and NL-means denoising on Nori framework to render a scene portraying 'Man on Mars' based on the project theme of 'Out of Place'.

## Lane Detection Algorithm for Autonomous Vehicles

March 2019

Mars Rover Manipal research member, **globally 8th** at University Rover Challenge 2019 [ [code](#) ]

- Built an algorithm by combining the **SegNet** and **LSTM** deep learning architectures.
- Performed image processing techniques like edge detection, perspective transforms, and polynomial curve fitting using **OpenCV**.

## TECHNICAL SKILLS

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**Languages:** Python, C, C++, Java, Kotlin

**Tools and Libraries:** PyTorch, Tensorflow, OpenCV, Pandas, Matplotlib, Blender, ITK, VTK, 3D Slicer

## EXTRACURRICULAR

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- **Co-Founder and Technical Head**, [Research Society Manipal](#): administered a student body of 100+ members promoting inter-disciplinary research, mentored students in the field of AI, and hosted webinars with experienced researchers.
- **Member**, [ACM-Women in Computing](#): official university chapter, provided mentorship to female undergraduates with the aim of creating a community for women in STEM fields.
- **Volunteer**, [Teach Code for Good, Manipal](#): tutored underprivileged students in a needful school on Computer Science topics and programming languages like Python and C.
- **Writer**, [Manipal The Talk Network](#): published articles ranging from informative articles on technology to creative pieces on literature at Manipal's largest independent media organization in India.