Sayan Deb Sarkar

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Academic Qualifications

- **ETH Zurich** Sept 2022 - May 2024 (expected)
  Zurich, Switzerland
  MSc. Computer Science, Major in Visual Interactive Computing
  Relevant Coursework : Computer Vision, Computer Graphics

- **Manipal Institute of Technology** Aug 2016 - Jul 2020
  Manipal, India
  B.Tech in Information Technology; CGPA: 9.16/10.00
  Relevant Coursework : Data Structures, Design and Analysis of Algorithms, Social Network Analytics

Technical Skills

- **Languages** Python, C++, Java, JavaScript
- **Tools/Frameworks** Tensorflow, Pytorch, OpenCV, D3.js, mySQL, Node.js, Django, mongoDB, git

Work Experience

- **Computer Vision Research Engineer, Mercedes-Benz R & D India Pvt. Ltd.** May 2021 - April 2022
  Bangalore, India
  - Worked in the **Intelligent Interior Team** of MBUX Interior Assist programme for **Maybach S-Class** series.
  - Responsible for designing deep-learning based vision modeling for driver monitoring system like 3D head position estimation and depth estimation from monocular RGB images for face spoofing applications in **Multi-Purpose Integrated Camera(MPIC)** systems.

- **Research Assistant, Institute of Computer Graphics and Vision, TU Graz** Jan 2020 - May 2021
  Graz, Austria
  - Worked under the supervision of **Prof. Vincent Lepetit** at the **Computer Vision For Augmented Reality Lab**, funded by **Qualcomm Inc**.
  - Developed an automated method for joint optimisation of **3D hands+object poses** in RGB-D action sequences and improved the annotation accuracy by over **33%**.
  - Explored problems on **3D Room Layout Estimation** and **Indoor Scene Understanding** using Monte Carlo Tree Search from noisy RGB-D scans.

Relevant Publications

1. Shreyas Hampali, **Sayan Deb Sarkar**, Mahdi Rad, Vincent Lepetit, **Keypoint Transformer: Solving Joint Identification in Challenging Hands and Object Interactions for Accurate 3D Pose Estimation**, *CVPR, 2022* **[paper]** **[code]**
2. Sinisa Stekovic*, Shreyas Hampali*, **Sayan Deb Sarkar**, Chetan Srinivasa Kumar, Friedrich Fraundorfer, Vincent Lepetit, **Monte Carlo Scene Search For 3D Scene Understanding**, *CVPR, 2021* **[paper]** **[code]**
3. Sinisa Stekovic, Shreyas Hampali, Mahdi Rad, **Sayan Deb Sarkar**, Friedrich Fraundorfer, Vincent Lepetit, **General 3D Room Layout from a Single View by Render-And-Compare**, *ECCV, 2020* **[paper]** **[code]**

Research Experience

- **Merging Partial 3D Scene Graphs** Sep 2022 - Present
  Guide : Dr. Iro Armeni, Dr. Ondrej Miksik (Microsoft Mixed Reality & AI Lab) ETH Zurich
  Supervisor : Prof. Dr. Marc Pollefeys, Computer Vision For Geometry Lab
  - The goal of this project is, given partial 3D scene graphs of a large space, to align them together to create one coherent scene graph and explore the effect of noise in both geometry, semantics, the case of change in the scene.
  - Understanding the relevant ground truth geometry and semantics and focusing on identifying the appropriate structure and features for this task, as well as the minimum overlap across scene graphs to perform the alignment.

- **Predicting Invasive Ductal Carcinoma using Convolutional Neural Networks** July 2019 - Nov 2019
  Guide : Prof. Dr. Harish Kumar JR Manipal Institute of Technology
  [Project Report]
  - Proposed a simple and effective CNN architecture for automated detection of invasive ductal carcinoma using whole-slide images of breast cancer tissues.
  - Experimented and evaluated on the Breast Cancer Histopathology dataset of 277,524 images from 162 patients, achieving a state-of-the-art metric in Balanced Accuracy as **0.8897** and F1-score as **0.8675**.

Internships

- **Summer Research Intern, Indian Institute of Science** May 2019 - Jul 2019
  Bengaluru, India
  - Worked under the supervision of **Prof. Chandra Sekhar Seelamantula** at the Spectrum Lab on the project - **Micro Aneurysm Detection For Early Diagnosis of Diabetic Retinopathy**.
  - Developed a variant three-stage **REDNet** architecture for segmentation of aneurysms in retinal fundus images that gains a Free Response Operating Characteristic **(FROC)** score of **0.4033** and prevents prognosis of DR in patients.

Positions and Awards

- **Technical Head, Defeat COVID**, a non-profit organisation, aimed at tracking the spread of COVID-19 using a mobile-based heat map interface.
- **Artificial Intelligence Team Member, Dronaid**, a college-based student project aiming to build trauma response and pre-medical health care infrastructure.
- **Management Committee Member, IECSE Manipal**, official university Computer Science chapter, co-worked with a team of 80+ members to conduct technical workshops and events for benefits of the students.