Sayan Deb Sarkar

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Academic Qualifications

- **Manipal Institute of Technology** — Manipal, India
  B.Tech in Information Technology; CGPA: 9.16/10.00 — Aug 2016 – July 2020

Work Experience

- **Computer Vision Research Engineer, Mercedes-Benz R & D India Pvt. Ltd.** — May 2021 - Present
  Bangalore, India
  - Working 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.

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.
- **Project Intern, Indian Institute of Technology - BHU** — Dec 2018 - Jan 2019
  Varanasi, India
  - Worked under the supervision of **Prof. Amrita Chaturvedi** on the project - **A Multi-Class EEG Classification using Filtering and Soft Computing Techniques**, on Graz 2008 Dataset.
  - Applied Noise Reduction followed by feature extraction using filter bank Common Spatial Pattern and dimensionality reduction, subsequently pipe-lining XGBoost algorithm to achieve an accuracy of approx. **85%**.
- **Software Developer Intern, Workathlon** — May 2018 - Jun 2018
  Athens, Greece
  - Responsible for designing an employee level workflow for the intelligence powered recruitment company using **C++**, cutting their overhead delays by **25%**.
  - Developed an automated document scanner using **Python** and **OpenCV** for resume uploading from job seekers to reduce manual intervention by **50%**.

Publications

1. Shreyas Hampali, **Sayan Deb Sarkar**, Mahdi Rad, Vincent Lepetit, **HandsFormer: Keypoint Transformer for Monocular 3D Pose Estimation of Hands and Object in Interaction** [paper]
2. Sinisa Stekovic*, Shreyas Hampali*, **Sayan Deb Sarkar**, Chetan Srinivasa Kumar, Friedrich Fraundorfer, Vincent Lepetit, **Monte Carlo Scene Search For 3D Scene Understanding**, *IEEE 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]
4. Shreyas Hampali, **Sayan Deb Sarkar**, Vincent Lepetit, **HO-3D v3: Improving the Accuracy of Hand-Object Annotations of the HO-3D Dataset** [paper]
5. Sayan Deb Sarkar, Ajitha Shenoy KB, **Face Recognition using Artificial Neural Network and Feature Extraction**, *IEEE SPIN, 2020*[paper]

Relevant Projects

- **Predicting Invasive Ductal Carcinoma using Convolutional Neural Networks**
  [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**.
- **Skin Lesion Classification Using Feature Extraction Backbones and An Encoder-Decoder Network**
  [Project Report]
  - Trained a fully automated encoder-decoder-style pyramid architecture which utilises the backbone extracted feature map for classification.
  - Suggested a segmentation-map-based pre-processing approach to enhance the lesion regions before feeding as input to a network.
  - Achieved an average Area Under the Receiver Operating Characteristic **(AUROC)** curve value of **91.55%** on the **150** images on the validation set in the **ISIC 2017** challenge.

Technical Skills

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

Certifications and Courses

- **Relevant Coursework**:
  - Data Structures
  - Design and Analysis of Algorithms
  - Computer Vision
  - Social Network Analytics
  - Data Warehousing and Data Mining
- **Relevant Certifications**:
  - Deep Learning Specialisation - **Coursera**
  - Machine Learning Basic Nanodegree - **Udacity**
  - Python For Everybody Specialisation - **Coursera**
  - Machine Learning - **Coursera**
  - Big Data Specialisation - **Coursera**

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.
- Awarded **Leadership Development Experience** as a part of **Global Entrepreneurship Exchange Programme**, **AIESEC**, 2018.
- **Human Resources Department**, Core Committee Member, **Revels '19**
- **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.