Aryaman Sharma

+916291017509 | aryaman.aryan@gmail.com | LinkedIn | GitHub

Master's Degree student specializing in 3D reconstruction and pose estimation, seeking a career opportunity in computer vision. Passionate about learning and exploring State-of-the-art techniques to solve real-world problems.

Experience

Master Thesis Intern Mar. 2024 – Present

Laboratoire Hubert Curien *Saint-Etienne, France*

- Master Thesis Title: Neural Radiance Fields (NeRFs) relighting for VR visualization
- Creating a varying-illuminant dataset for 3D Gaussian Splatting Relighting without repetitive data preprocessing
- Developing a novel feature for existing 3D Gaussian Splatting algorithms to support HDR (High Dynamic Range) images along with sRGB
- Designing an algorithm for transferring 3D Gaussian parameters from reconstructed scenes to relight in unseen lighting conditions
- Skills and Tools: Python, CUDA, 3D Gaussian Splatting, WebVR, 3D rendering, Mitsuba

Summer Intern June 2023 – Aug. 2023

Laboratoire Hubert Curien *Saint-Etienne, France*

- 2D and 3D pose estimation, Avatar Creation for assist in European Commission funded Premiere Project
- Worked on SMPL-X-based Avatar creation, and keypoint detection from monocular videos using SOTA models
- Comparison between Human body avatars generated from videos and synthetically designed Avatars
- Studied different 3D models for Human body avatars such as MANO, FLAME, SMPL, SMPL-X, and visualization using Three.js and OpenXR
- Skills and Tools: Python, Open-CV, Pose-Estimation, Expressive Human Body Avatar Creation, 3D visualization using Three.js, Python

Intern Jun. 2021 – Mar. 2022

Indian Statistical Institute *Kolkata, India*

- Skeletal Pose Estimation to create novel videos containing sentences in Indian Sign Language from single word videos
- Identification of key points and correlating between different frames
- Survey analysis by computing success or failure of results between test and control group by using statistical analysis tests
- Skills and Tools: Database Management, Open-CV, Pose Estimation, Statistical Analysis

Projects

Les Furnitures | *Python, PyTorch, CUDA, Three.js, WebXR* April 2023 – June 2023

- Developed a multi-model pipeline for single shot room reconstruction and visualization without Neural Fields, Structure from Motion or inpainting
- Implemented Handshake between Object Detection and Semantic Segmentation model Grounded DINO(Grounding DINO, Segment Anything) and Depth Estimation Models ZoeDepth and LeReS
- Extraction of room dimensions and relative position of furniture and openings
- Visualized the room in Virtual Reality based on the dimension and added standard furniture geometry at extracted coordinates using three.js and HTML
- Quickstart and Notebook Demo: https://github.com/AryamanSharma17/ScenRec

Eye Tracking data recording and analysis | *Python* Oct 2022 – Dec 2022

- Developed a Fixation Detection Algorithm with custom Dispersion Threshold
- Evaluated the performance of the Algorithm compared to the U'n'Eye Algorithm
- Use of GazeRecorder API and Tobii 4C for data recording and set an experiment for studying effects of Dementia by tracking Eye movement

Education

Erasmus Mundus Joint Master Degree Japan – Imaging and Light in Extended Reality (IMLEX)

Sep. 2022 – Present

Semester 1: University of Eastern Finland *Joensuu, Finland*
Awarded Degree: Master of Science in Computer Science "Imaging and Light in Extended Reality"

Semester 2: Université Jean Monnet *Saint-Étienne, France*
Awarded Degree: Master Optics, Image, Vision, Multimedia with the specialization "Imaging and Light in Extended Reality"

Semester 3: Toyohashi University of Technology *Toyohashi, Japan*
Awarded Degree: Master of Engineering

Semester 4: Université Jean Monnet-Laboratoire Hubert Curien *Saint-Étienne, France*
Thesis Title: 3D Gaussian Splatting (3DGS) and Neural Radiance Fields (NeRFs) relighting for VR visualization

GPA: 3.91

Scholarships and Grants:
Erasmus+ Mobility, JASSO Scholarship, BRMI Grant, Erasmus+ Traineeship , Manutech-SLEIGHT - Mobility

Bachelor of Technology in Optics and Optoelectronics Engineering

July 2018 – Aug. 2022

University of Calcutta *Kolkata, India*
Thesis Title: Python-based microscope control and image visualization for next-gen light-sheet microscopes
GPA: 8.5/10

Technical Skills

Languages: Python, C/C++, JavaScript, HTML/CSS, R, MATLAB, LaTeX
Frameworks: Three.js, ViteJS, Nerfstudio, Gaustudio
Developer Tools: Git, Docker, VS Code, Visual Studio
Libraries: Keras, Tensorflow, SciPy, Scikit-Learn, Sckikit-image, Jupyter, Pandas, NumPy, Pytorch, Anaconda, Matplotlib
3D rendering and XR Development: Unity, Blender, OpenGL, WebXR