

# Aryaman Sharma

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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

## 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

## PROJECTS

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**Les FURNITURES** | *Python, PyTorch, CUDA, Three.js, WebXR*

April 2022 – June 2022

- 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>

## TECHNICAL SKILLS

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**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:** Jupyter, Pandas, NumPy, Pytorch, Anaconda, Matplotlib

**3D rendering and XR Development:** Unity, Blender, OpenGL, WebXR