Richards Britto

Computer Vision Engineer

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Education

Master's | Uppsala University

Sept 2021 – Nov 2023 Uppsala, Sweden

- Major: Image Analysis and Machine Learning

Bachelor's | National Institute of Technology Trichy

Sept 2016 – May 2020 Tiruchirappalli, India

- Major: Electronics and Communication Engineering
- Minor: Humanities and Social Sciences (Economics)
- GPA: 8.01

Work Experience

Synthetic Data Generation | VIDHANCE AB

Sept 2022 – Jan 2023 Uppsala, Sweden

- Crafted Blender Python API tool for realistic synthetic datasets, replicating real world camera effects and responsive sensor-driven camera motions—cutting down over 20 weekly hours previously spent on real videos.
- Collaborated with a four-member agile team to generate videos featuring depth maps, optical flow, and customizable environmental factors.

Academic Research

iNPH Diagnosis using DL (Masters Thesis) |

Feb 2023 – Sept 2023 Uppsala University, Sweden

- Utilized **nn-UNet** to precisely estimate 3D voxel coordinates of bio-markers with **sub-millimeter** accuracy and aligned MRI scans to the Talairach coordinate system.
- Segmented 3D binary masks for lateral ventricles and whole brain via FastSurfer and Synthstrip, then computed Evan's Index, operating on NVIDIA 3090-Ti in Linux env.

Occlusion Aware Origami Pose Estimation |

May 2020 – April 2021 NUS, Singapore

- Developed a unique pipeline with **Mask-RCNN** and **GAN** for tasks like depth map and 3D keypoints generation.
- Attained a 97% accuracy in pose estimation by employing a modified **Mask-RCNN** with concatenated RGB and depth features.

Co-Curricular Activities

- 3D modelling and anime sketching.
- Represented university's Football Team, Athletics Team, and Power-Lifting Team.
- Playing for 5th division football club (IK Apollon).

Technical Skills

- **PL :** Python, C++, JavaScript/JSX, LaTex, HTML/CSS
- **ML Library :** PyTorch, OpenCV, Open3D, NumPy, Pandas, Matplotlib, MONAI, scikit-learn, SciPy, PyGame
- **Dev Tool :** Git, CUDA, SSH, venv, VSCode, Linux, Docker
- **Software :** MATLAB, Blender, CARLA, Unity, MS Office

Project Work

3D Object Detection using LiDAR |

Feb 2024 – Mar 2024 Uppsala, Sweden

- Implemented SFA3D algorithm for 3D object detection on the KITTI dataset, utilizing Bird's Eye View representation of LiDAR point cloud data. Employed Keypoint-FPN architecture with ResNet 18 backbone.

MIP Control and Dynamcs |

Dec 2023 – Feb 2024 Uppsala, Sweden

- Designed a control system for Mobile Inverted Pendulum in **MATLAB**, incorporating **Extended Kalman Filters** for state estimation and **PD controllers** for dynamic stabilization, resulting in 25% increase in system stability.

3D Scene Rendering using NeRF |

Dec 2023 – Jan 2024 Uppsala, Sweden

- Employed Blender's Python API to generate a synthetic dataset containing ∼150 RGB images and camera parameters, then trained **NeRF** to model volumetric scenes.

Monocular ORB-SLAM |

Nov 2023 – Dec 2023 Uppsala, Sweden

- Executed **6 DoF** camera pose estimation and 3D scene reconstruction utilizing the TUM RGBD dataset.
- Leveraged the **PnP** algorithm for pose estimation, refined results through **bundle adjustment**, and applied **Bags-of-Words** for loop closure, 0.12 RMSE was achieved.

Ray Tracing Implementation in C++ |

Sept 2023 – Oct 2023 Uppsala, Sweden

- Engineered ray tracing techniques in C++ including motion blur, textures, lights, and volumetric effects, achieved a 40% rendering speed boost using BVH.

Autonomous Driving in CARLA | |

Jan 2023 – Feb 2023 Uppsala, Sweden

- Implemented a **CNN** based **DQN** to control agents using high-dimensional sensory inputs like vision and velocity.