

# **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

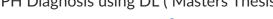
# **Work Experience**

#### 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 | 🜎 | 🕤





- **i** Jan 2023 Feb 2023
- Uppsala, Sweden
- Implemented a CNN based DQN to control agents using high-dimensional sensory inputs like vision and velocity.