



Anirudh Narasimamurthy Jayasimha

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Work Experience

Student Research Engineer	REWE Digital, Köln - Germany	Aug 2020 - May 2021
<ul style="list-style-type: none">Designed and Implemented a pipeline for human hand pose estimation pipeline for multimodal data using 3D point cloud processing techniques and mediapipe based CNN models. (<i>python, Realsense, Open3D, OpenCV</i>)Prototyped large scale object detection pipeline for warehousing applications using CNN and various computer vision techniques. (<i>python, OpenCV, TensorFlow</i>)		
Student Research Engineer	Fraunhofer FKIE, Wachtberg - Germany	June 2019 - May 2020
<ul style="list-style-type: none">Researched and prototyped ways to integrate Unity with ROS for 3D robot and pointcloud visualization in a VR environment. (<i>C#, python, Unity, ROS-bridge</i>)Wrote a standalone software for automatically converting ROS models into Godot compatible 3D models and importing. (<i>python, C++, Unity</i>)		
Senior Software Engineer	Cognitive Machines, Bangalore - India	Feb 2016 - May 2018
<ul style="list-style-type: none">Created Augmented Reality application with custom algorithms based on Natural Feature Tracking for both Android and iOS. (<i>Basic Java/NDK Android, Basic Swift iOS, OpenCV</i>)Designed and implemented a Modular in-house image processing framework based on Process Block Architecture. (<i>C++, OpenCV</i>)Offline Drone photography based vehicle counting system for parking lots using an SVM based object finder with over 90% accuracy on real world data. Complete cross platform GUI application created in Qt with 5 < screens structured as Model View Controller . (<i>C++, Qt, OpenCV, DLib</i>)		

Skills

Programming Languages	Frameworks/Tools and Hardware
<ul style="list-style-type: none">PythonModern C++ and CMakeC# and Java (Basic)SQL (Basic)Google Cloud Platform (Basic)	<ul style="list-style-type: none">OpenCV, DLib, PCL, Open3D (C++, python)PyTorch, Pytorch-Lightning, TensorFlow KerasQt (C++, python)Git, Git CI, DockerScikit-learn/image, pandas, matplotlib, numpyRGB cameras, GigE, Intel Realsense

Projects

- CNN based object detection for counting edible nuts of 3 classes in a video*** : Detecting the stable frame in the video using classic computer vision techniques like hashing and then using a custom trained Faster R-CNN for object detection. This implementation achieved the highest score and ***First place in the competition among 30+ contestants*** with a success rate of 85% on hold-out dataset. ([code](#))
- Modular Autoencoder framework in Pytorch and Pytorch lightning*** : Dynamically generated model inputs, representation and output layers from config files for easier prototyping and fast training. ([code](#))
- AR-Toolkit 5 and OpenCV based Natural Feature Tracking (NFT) application*** : Integration of AR-Toolkit C++ code with OpenCV with custom compatibility wrapper. (C++, OpenCV) ([code](#))
- Placed second in the Siemens eHighway 2021 Hackathon*** : Involved 2D image and 3D lidar data processing and visualization for road infrastructure development and planning. (Open3D, Qt)
- Members of the team placed ***second in Catalysts Coding Contest 2019 - Köln.*** (pandas, numpy, scikit-learn)

Education

Sept 2018 - Present	Masters in Science (M.Sc) , Autonomous Systems <i>Hochschule Bonn-Rhein-Sieg , Germany</i>
Aug 2011 - June 2015	Bachelor of Engineering (B.E), Mechanical Engineering <i>National Institute of Engineering, India</i>

Publications and Research

- Mitrevski, Alex, Ahmed Abdelrahman, **Anirudh NJ**, and Paul G. Plöger. " On the Diagnosability of Actions performed by Contemporary Robotic Systems ." DX 2020 - ([paper](#))
- **Anirudh NJ** , Mitrevski, Alex, Paul G. Plöger. " Handle Grasp Improvement using Weighted-Maximum Likelihood Estimation ". 2020 (Preprint) - ([paper](#))
- **Master Thesis** on " Visuomotor Policy Learning for Predictive Manipulation " - ([report](#), [code](#))
 - Testing different **Autoencoders for image representation generation**. (PyTorch)
 - **Deep Reinforcement Learning** with **Gaussian Process** for predicting success of task using policy output in a custom Kinova3 arm and CoppeliaSim environment using **StableBaselines-3**.
- **Research and Development Project** on " Manipulation of Handles in Domestic Environments " - ([report](#))
 - **Deep Reinforcement Learning** in the DoorGym environment for handle manipulation.
 - Object detection for detecting different classes of handles in images and obtaining its 3D location with respect to the robot base using pointcloud processing. (Tf-Object Detection Api, PCL)
 - Complete handle manipulation pipeline with Weighted-Maximum Likelihood Estimation run on Toyota HSR robot. (OpenCV, ROS)

Language

English (Business Proficiency), German (Basic - Actively Learning), Hindi (Business Proficiency), Kannada (Mother Tongue)

Hobbies

Playing Guitar, Astronomy, Running and Hiking, DIY projects, Music