Sharmitha Ganesan

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EDUCATION

Master of Engineering in Robotics, University of Maryland - College Park | GPA: 3.8/4 **Expected May 2023**
Coursework: Computer Vision, Planning and Perception for Autonomous Robots, Software Development for Robotics, Machine Learning, AI planning, Robot Learning
Bachelor of Technology in ECE, **Pondicherry Engineering College | GPA : 9.2/10** **2016 – 2020**
Coursework: VLSI Design, Embedded Systems, Digital System Design, Electronic Circuit Design
Notable BTech Projects: UV_wearable , sign_language_to_voice-model , anti_glare_goggles

SKILLS

Programming Languages : C++, PYTHON, MATLAB, Verilog
Operating Systems : Ubuntu, WSL,Windows, Raspbian
Tools : ROS 1 & 2 , PCL programming, GAZEBO, SOLIDWORKS, Keras, TensorFlow,Torch, OpenCV, Open3D, RViz, ROSBAG, ROSPY, PCL_ROS, Pygame, 3D printing (FDM), LabView, Ignition

WORK EXPERIENCE

Maryland Applied Graduate Engineering, UMCP *Graduate Grader* **Jan 2023 - Present**
- Enabling students to simulate autonomous robots in the ARIAC industrial automation environment in the course ***Building a Manufacturing Robot Software System*** (ENPM663).

Maryland Robotics Center, UMCP *Research Assistant (RA)* **Apr 2022 - Present**
- Working as an RA, leading the perception and planning team for autonomous navigation of REZOOM E-Scooters inside the UMCP campus area.
- Developed point cloud processing solution with semantic segmentation model and tested on Jetson Orin with inputs from ZED2i RGBD camera.
- UMD Grand Challenges: ***Individual Project Grant Recipient*** Link

Fossilshale Embedded Technologies Pvt. Ltd., Bangalore, India *Hardware Design Intern* **Jan – Apr 2020**
- Design of UAV controller board in Altium and comparing UAV state estimation performance for indoor operation.

PROJECTS

- **REZOOM AUTONOMOUS E-SCOOTER** | DL, CV and Hardware **Apr 2022- Present**
  Semantic segmentation of input from ZED2i camera to perform local path planning in real time for e-scooter navigation | Processed point clouds using semantically segmented frames to feed in to the movebase local planner | NVIDIA Jetson Orin and Nano Developer Kit platforms are used | C++ and ROS | Link
- **ARIAC (NIST) |** Industrial Automation **Jan 2023 - Present**
  Agile Robotics for Industrial Automation Competition | Cost optimized software development to perform kitting and assembly tasks with UR10e and AGVs in ROS Gazebo | Integrated with break beam sensors, RGBD camera, lidar, laser profiler, proximity sensors | Python and ROS | Link
- **HI-RES MONOCULAR DEPTH ESTIMATION** | DL and CV **Oct - Dec 2022**
  Implementation of boosting the monocular depth estimation in critical cases using MiDAS and LeRes | Panoptic segmentation results used to achieve high resolution depth estimation | Python | Link
- **SLIC** | ML and CV **Sept - Oct 2022**
  Simple Linear Iterative Clustering implementation in RGBXY (5D) space | Developed source code of boundary recall and under segmentation error metrics with more than 90 % accuracy | Python | Link
- **HUMAN DETECTION AND TRACKER USING YOLOv5s** | DL **Sept - Oct 2022**
  Human detector and tracker implementation using YOLOv5s deep learning model | Agile Iterative process of software development with Doxygen documentation | C++ and ROS | Link
- **AFFINE SFM IMPLEMENTATION |** CV **Aug - Sept 2022**
  Performed feature detection and tracking (kanade-lucas-tomasi algorithm) for a sequence of images, and the shape and motion of 3D points are recovered using Affine Structure from Motion algorithm | Python | Link
- **GESTURE CONTROL BOT** | Hardware, CV and Serial Comm **Apr - May 2022**
  Controlling a differential drive robot with hand gestures using principal component analysis(PCA) | Gesture control achieved in turtlebot with serial communication interface | Python | Link
- **MOBILE BOT DEVELOPMENT** | Hardware, CV and Controls **Jan - May 2022**
  Development of a mobile bot from scratch to autonomously navigate without path planner | Obstacle detection and localization with IMU and optical encoder | Python | Link