SIDDHARTH DEY

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EDUCATION

University of California San Diego *Mar' 2024*
Master of Science, Electrical and Computer Engineering *CGPA: 3.85/4.0*
- Coursework: Deep Learning for 3D Data; Statistical Learning; GPU Programming; Sensing and Estimation in Robotics; Deep Generative Models; Introduction To Visual Learning; Digital Image Processing

Indian Institute of Technology Madras *Jul' 2022*
Bachelor of Technology (Honours), Mechanical Engineering *CGPA: 9.18/10.0*
- Coursework: Data Structures, and Algorithms; Introduction to Robotics; Dynamics and Control of Serial Robots

SKILLS

Programming Languages: Python, C/C++, MATLAB
Python Libraries: PyTorch, Keras, scikit-learn, MLflow, OpenCV, ROS, JAX, CUDA, NumPy, pandas
Software/Tools: Visual Studio, Git, AWS, Arduino, LaTeX, ONNX, SolidWorks, ANSYS, Adams

PROFESSIONAL EXPERIENCE

Rivian | Machine Learning Engineering Intern | Palo Alto, USA *Jun 2023 – Sep 2023*
- Performed comprehensive analysis of motion prediction models for trajectory estimation of surrounding road users
- Trained the transformer-based Wayformer model from scratch on the Waymo Open Motion Dataset (WOMD)
- Worked on optimizing the ONNX computational graph and reducing model size using Post-Training Quantization

Toyota Connected India (TCIN) | Computer Vision Intern | Chennai, India *Dec 2020 – Mar 2021*
- Implemented detection and mapping of small obstacles on the road and Bird's Eye View (BEV) map generation
- Trained an Encoder-Decoder CNN on LostAndFound dataset for semantic segmentation using OpenCV and Keras
- Integrated Adabins for monocular depth estimation and Detectron2 for detection with pre-trained weights

Fixnix | Data Lake Intern | Chennai, India *May 2019 – Jul 2019*
- Laid foundation for the Regulatory Risk Data Lake Project and developed tools to automate the web crawling process using Python libraries like Beautiful Soup and Selenium to scrape online data
- Structured the scraped data with Named Entity Recognition (NER) using Spacy for keyword identification

RESEARCH EXPERIENCE & PROJECTS

Motion Prediction and 3D Multi-Object Tracking (MOT) *Oct 2023 – Present*
- Integrated Poly-MOT for 3D MOT into the self-driving stack for the Autonomous Vehicle Laboratory (AVL)
- Exploring the combined application of motion prediction models such as HiVT and Multi-Hypothesis Tracking (MHT) on the nuScenes dataset to enhance object tracking performance in high occlusion scenarios

Course Projects *Oct 2022 – Present*
- Pose Estimation: Performed 6D pose estimation from point cloud by using Iterative Closest Point and PointNet
- Particle Filter (PF) SLAM: Used PF for a LiDAR-equipped wheeled robot to generate the occupancy grid map
- CUDA accelerated Q-learning: Trained multiple agents in parallel threads using CUDA to navigate in a 2D grid
- Depth Diffusion: Trained a conditional Latent-Diffusion Model for monocular depth estimation on the NYU dataset

Learning-based Task Recommendation System *Oct 2022 – Mar 2023*
- Trained a Transformer-Encoder model in PyTorch to evaluate the repetitions in a physical therapy exercise video
- Used MLflow to track the parameters and metrics of the different experiments and log the artifacts in AWS S3

Underwater Glider Design using Variable buoyancy *Jun 2021 – Apr 2022*
- Published a paper titled "Towards Mission-Specific Characterization of the Diving Performance of an Underwater Glider" in the IEEE Oceans Conference & Exposition, 2022 [Link]
- Worked on Multi-objective Optimization of wing parameters using Genetic Algorithm and K-means clustering

Survey of Reinforcement Learning Algorithms for Drone Navigation *Apr 2020 – Apr 2021*
- Simulated an indoor drone capable of navigating in a GPS-denied environment with obstacle avoidance
- Trained the drone to plan a collision-free path in minimal time with RL algorithms including Deep Q Network (DQN) and Actor-Critic using ROS and Gazebo for simulation and used MAVROS for drone's flight control