JINESH RAJASEKHAR

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EDUCATION

M.S. in Robotics Engineering, Worcester Polytechnic Institute, Massachusetts **Aug.'22 -Present**
Courses: Deep Learning, Machine Learning, Artificial Intelligence, Foundations of Robotics *GPA : 3.67/4*

B.Tech. in Electrical & Electronics Engineering, National Institute of Technology **July '17 - May '21**
Courses: Artificial Neural Networks, Computational Techniques, Data Structure and Algorithms *GPA : 7.64/10*

SKILLS

Programming Languages: Python, C/C++, Embedded C, MATLAB, LaTeX
Frameworks Packages: ROS, PyTorch, TensorFlow, OpenCV, Git, PyQT
Microprocessors/controllers used: ATSAMD21, Arduino
Software & Tools: SIMULINK, V-Rep, CARLA

EXPERIENCE

Research Assistant **WPI, Massachusetts**
Prof Ziming Zhang; Vision, Intelligence and Systems Lab *Jan. '23 - Present*
- Implemented RGB-guided LiDAR point cloud completion with uncertainty estimation using a CNN.
- Improved LiDAR accuracy and completeness compared to state-of-the-art methods using a dataset of LiDAR and RGB data.

Spine Surgery Robot **HTIC, India**
Software Engineer at Healthcare Technology Innovation Center *May. '22 - July '22*
- Build a graphical user interface for the doctors to perform clinical trials using the 6-DOF Image-guided Surgical Robot, and the interactions were made to simulate live in Pybullet engine.
- Designed the framework on PyQT which establishes the communication between GUI and Pybullet using XML-RPC protocol call.

Bipedal Walking **IIIT Hyderabad, India**
Prof Abhishek Sarkar, Robotics Research Center *July '20 - October '20*
- Developed a 12DoF Dynamic Walking Robot in Matlab-Simulink, which can traverse through a flat plane.
- Implemented Footstep planning and generated Zero moment points from the reference path and current position. Inverse Kinematics is applied to actuate to the desired position for the corresponding joints.

Detection of Varus Thrust in Knee Osteoarthritis **IIT Madras, India**
Prof Varadhan SKM, Neuromechanics Laboratory *May '19 - July '19*
- Designed a wearable device to monitor the gait movement of older adults, who are likely to have Varus Thrust
- Applied Kalman filters to reduce noise from IMU sensors, predictions were updated in real-time using Pygame.

PROJECTS

Image Classification of Stroke Blood Clot Origin Sept. '22 - Dec.. '22
- Objective: To analyze pathology images of blood clots and classify the etiology to either CE (i.e., originating from the heart) or LAA (i.e., originating from the plaque in the inner lining of an artery).
- Used DenseNet and ResNet network with transfer learning to classify blood clot images to detect their origin. Achieved an accuracy of 72.4% and 73.75% with an F1 score of 0.701 and 0.765 respectively

Implementation of Deep Q Learning (DQN) on Racetrack Environment Sept. '22 - Dec.. '22
- Objective: To train the car in a racetrack environment to overtake, change lanes and follow the track
- Used DQN network in Open AI gym environment and analyzed how different model parameters affect the performance of the racing car.

Simulation in Self-Driving Cars June. '21 - Aug.. '21
- Implemented Stanley controller in a self-driving car in CARLA Simulator to follow a race track environment.
- Model Predictive Control was used to implement lateral lane switching, and Python was used to simulate it.

SPEAR: Soft Robotic EMG Assisted Rehabilitation Sept. '18 - Mar. '19
- A bio-inspired solution for foot rehabilitation of stroke with temporary foot paralysis.
- Developed a control system by using EMG signals to control the soft pneumatic actuators.