DAOQI ZHANG, E.I.T

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EDUCATION

University of Pennsylvania, Philadelphia, PA *May 2020*
MSE in Robotics, GPA: 3.7/4.0
Rutgers University, New Brunswick, NJ *June 2018*
BS in Mechanical and Aerospace Engineering, Minor: *Mathematics*, GPA: 3.75/4.0
Dean's List, Spring 2016 - June 2018

TECHNICAL STRENGTHS

Programming Skills:	Python, Java, C++, MATLAB, ROS, Git, HTML, CSS, Linux
Machine Learning & database Skills:	Pytorch, TensorFlow, Numpy, Pandas, MySQL.
Path Planning Algorithm:	Dijkstra, A*, D*, D*Lite, RRT, RRT*, Ant Colony Optimization

PROJECTS

Service Robot Manipulation and simulation *Fall 2019*
- Design the 3D modeling for arm using SolidWorks and simulated the arm using gazebo. Implemented the arm motion planning using RRT* and inverse kinematics solver in MoveIt.
- Implement floor detection feature for service robot to get off the elevator automatically. Use IMU data to detect elevator state and add the feature into the robot navigation stack under ROS platform.

F1/10 Autonomous Racing *Spring 2020*
- Programming in C++ and Python in ROS to achieve the autonomous racing on F1/10 simulator.
- Implemented the Emergency Braking, Wall following, Lidar Processing and PID control on the car.

Particle filter SLAM *Spring 2020*
- Used LIDAR, IMU, joints and odometry data recorded using a humanoid robot to create a planar map of the path followed by the robot and simultaneously localized the robot in that map

Quadrotor control, trajectory planning and state estimation *Spring 2019*
- Apply minimum snap trajectory planning, PID hover control and motion planning(Dijkstra and A*) algorithm on Crazyflie quadrotor for multiple tasks under VICON system.
- Implement a vision based 3D pose and velocity estimator using April Tag detection, optical flow and fused IMU data. Applied Extend Kalman Filter for estimate position and orientation, used RANSAC for hitting inliners.

5 DoF robotic arm manipulation *Fall 2018*
- Controlled arm manipulator using position control, velocity control and force control, knowledge of rotation matrix, quaternion, forward, inverse kinematics, DH convention, skew matrix and Jacobian matrix.
- Collision-free trajectory planning for a five degree of freedom robot arm to reach target positions using RRT, D* Lite and Potential Field algorithm.

WiFi-controlled Gaming Robotic Car *Fall 2018*
- Programmed the remote control of robotic car using UDP and I2C communications between micro-controllers (ESP 32). Implemented the autonomous mode using ultrasound.
- Designed 3D model and assembly of the robot car in SolidWorks. Designed the electric circuit and soldered the PCBs manually. Documented product specification, material selection, implementation process and BOM.

WORK EXPERIENCE

Robotics Software Engineer Intern - Planning and Control *Sep 2020 - Present*
LYF Innovation Ltd, Philadelphia, PA
- Working on the motor control of automotive mower under a start-up environment.
- Working on the trajectory planning that can completely cover a given area.

Mechanical Engineering Intern *Jul 2016 - Aug 2016*
Shenzhen High-Great Development Co.Ltd, Shenzhen, Guangdong, China
- Worked with Research and Development team in designing and drawing the Unmanned Aerial Vehicle Camera Platform using SolidWorks.