DAOQI ZHANG, E.I.T

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Self-motivated and passionate UPenn graduate working towards a robotics software engineer. Previous experience on implementing Dijkstra, A*, RRT, RRT*, ACO, Potential field and D* Lite algorithms. Solid understanding and practice of ROS and Deep Reinforcement Learning. Excellent programming skills on Python and Java.

EDUCATION

University of Pennsylvania, Philadelphia, PA *May 2020*
MSE in Robotics, GPA: 3.66/4.0

Rutgers University, New Brunswick, NJ *June 2018*
BS in Mechanical and Aerospace Engineering, Minor: *Mathematics*, GPA: 3.75/4.0

TECHNICAL STRENGTHS

Programming Skills:	Python, Java, MATLAB, ROS, Git, C++, Arduino, Latex
Hardware Skills:	SolidWorks, Soldering, Laser Cutting, 3D Printing, Circuit Design
Machine Learning & Simulation Skills:	Pytorch, TensorFlow, MoveIt, Gazebo

PROJECTS

Deep Reinforcement Learning on OpenAI environment *Spring 2020*
• Implement Policy Gradient and Deep Deterministic Policy Gradient (DDPG) algorithm in Tensorflow and test on OpenAI gym pendulum environment .
• Implement Double Deep Q Network algorithm in Pytorch and test on OpenAI gym cartpole environment. Achieve testing average reward of 200.

2D Motion Planning and trajectory optimization in dynamical environment *Spring 2020*
• Realize obstacle avoidance in unknown dynamical environment using D* lite algorithm and reach 100% success rate.
• Optimize the eight-connected grid map to smooth trajectory by convex optimization.

Particle filter SLAM *Spring 2020*
• Use raw Lidar, joints, IMU, odometry data to implement particle filter and SLAM with occupancy grid for humanoid robot.

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 IMU data. RANSAC and Extend Kalman Filter used for filtering.

5 DoF robotic arm motion planning *Fall 2018*
• Apply forward and inverse kinematics on Lynx robot to reach desire position.
• Generate collision-free trajectories for a five degree of freedom robot arm to reach target positions using RRT algorithm and Potential field methodology.

WORK EXPERIENCE

Teaching Assistant: Upenn edX Online Courses *Sep 2019 - Present*
Department of Online Learning, University of Pennsylvania, Philadelphia, PA
• Answer questions and lead virtual office hours for Upenn online robotics courses: *Kinematics and Mathematical Foundations, Vision Intelligence and Machine Learning* and *Dynamics and Control*.

Mechanical Engineering Intern *Jul 2016 - Aug 2016*
Shenzhen High-Great Development Co.Ltd, Shenzhen, Guangdong, China
• Work with Research and Development team in designing and drawing the Unmanned Aerial Vehicle Camera Platform using SolidWorks.
• Conduct field works to test the Unmanned Aerial Vehicle performance under different weather conditions and different controlling variables. The results were used to improve the PID control system of the drone.