XIAOZHOU ZHANG

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Education

University of Pennsylvania — Philadelphia, PA
M.S.E. in Robotics; GPA: 4.00/4.00 — *May 2021*
M.S.E. in Computer and Information Science; GPA: 4.00/4.00 — *May 2021*

Mao Yisheng Honors College, Southwest Jiaotong University — Chengdu, China
B.E. in Mechanical Engineering; GPA: 3.60/4.00; Ranking: 1/21(Honors Class) — *Jun 2018*

Experience

iFLYTEK Research Institute — Suzhou, China
Computer Vision Research Intern — *Jun 2019 - Aug 2019*

- Leveraged Mask R-CNN on x-ray machine for prohibited items detection
- Implemented human keypoint detection on x-ray machine by extending Mask R-CNN with such branch
- Developed GAN model for super-resolution reconstruction on medical lesion images

GRASP Lab — Philadelphia, PA
Research Assistant — *Spring 2018*

- Assisted develop prototype of low-cost HRI platform Quori
- Set up SLAM packages for autonomous navigation to human visitors
- Generated minimum jerk trajectory for arm module which mimics ball joint of human shoulder
- Conducted systematic test to evaluate the performance of arm module

Projects

F1/10 Autonomous Car Racing — Philadelphia, PA
End to End Framework for 1:10 Scaled RC Car Autonomous Racing — *Fall 2019*

- Developed wall following and reactive planning algorithms as local planner to run laps with RC car
- Achieved real time collision-free path planning with Informed RRT* in real environment
- Localized RC car using particle filter and point to line ICP for real time waypoint following
- Implemented raceline optimization for minimizing lap time using CMA-ES on given map
- Developed MPC pipeline with waypoint tracking and obstacle avoidance on CVXGEN

Quadrotor Control, Planning and Vision — Philadelphia, PA
End to End Framework for Autonomous Quadrotor Navigation — *Spring 2019*

- Formulated CrazyFile quadrotor's motor and rigid body dynamics modeling and geometric controller
- Implemented path planning with A* and Dijkstra's algorithm to fulfill complex indoor flying tasks
- With 4^{th} derivative of position input generated minimum snap trajectory for tracking
- Implemented pose estimation by VIO and optical flow
- Estimated and updated pose and velocity in real world with Extended Kalman Filter

Serial Manipulator Kinematics and Planning — Philadelphia, PA
Introduction to Robotics Course Project — *Fall 2018*

- Modeled 5 DOF Lynx robot in MATLAB for simulation
- Formulated foward, inverse and velocity kinematics to accomplish diverse tasks on real world platform
- Realized collision-free path planning with RRT and Artificial Potential Field in envrionment with obstacle
- Implemented real time path planning using D* search algorithom on given dynamic 2D map

Skills & Relevant Courses

Programming: C++/C, Python, MATLAB, JAVA

Platforms and Libraries: ROS, Pytorch, OpenAI-Gym, Simulink

Courses: Analysis of Algorithms, Networked Systems, Autonomous Car Racing, Advanced Machine Perception, Advanced Robotics, Data-Driven Modeling, Reinforcement Learning