RUIXIANG DU

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OBJECTIVE

Internship in the field of robotics, with special interests in motion planning of mobile robots.

EDUCATION

Worcester Polytechnic Institute (WPI), Worcester, MA USA
Doctor of Philosophy in Mechanical Engineering, GPA: 3.94/4.0 12/2018
Master of Science in Robotics Engineering, GPA: 3.83/4.0 06/2013

North China Electric Power University (NCEPU), Hebei China
Bachelor of Engineering in Automation, GPA: 87.9/100 07/2011

TECHNICAL SKILLS

Robotics: modeling, simulation, control and motion planning of robots
Programming Languages: C/C++, Matlab, Python
Software & Frameworks: ROS, V-REP, Gazebo, LCM, OMPL, Qt, Git, Linux
Embedded Development: Cortex-M3/M4, AVR, MSP430 (bare metal or with RTOS)

EXPERIENCE

Maneuver Intent Inference and Motion Planning for Self-Driving Cars 05/2017-08/2017
Autonomous Vehicle Intern *nuTonomy*

- Conducted literature review on intent inference for path planning of autonomous vehicles
- Developed an inference model and implemented the model in C++
- Interfaced with nuTonomy code base and tested the algorithm with real data from the cars

Hierarchical Motion Planning for Small Unmanned Aerial Vehicles 01/2016-Present
Research Assistant in Systems and Robot Control Laboratory *WPI*

- Implemented 2D map representation using square grid and quadtree
- Integrated Octomap and constructed graph representing local 3D space
- Experimented with A* and RRT* to find optimal paths online with limited global information and onboard sensor data in a partially known environment
- Tested a QP-based minimum-snap optimization algorithm for fast local trajectory generation
- Exploring motion planning algorithms for one task agent with multiple sensing agents

DARPA Robotics Challenge Trials & Finals, Team WPI-CMU 09/2013-06/2015
Research Assistant in Robotics and Intelligent Vehicles Research Laboratory *WPI*

- Participated in the discussion and decision making of overall team strategies and led a sub-team towards the completion of wall task for the Finals
- Implemented a state machine and position and force controllers for the wall cutting task

- Studied the whole-body manipulation controller developed by CMU and collaborated on the interfacing with task-level features
- Experimented on strategies for the door task of DRC Trials to traverse different types of doors
- Developed the motions and user control interface for the door task using MoveIt and Qt
- Performed numerous tests on both the real Atlas Robot and the Gazebo simulator to tune controller parameters and explore feasible motions

PROJECTS

Physics-Based Robot Simulation 07/2015-09/2015

- Constructed the simulation for the 2-link pelican robot arm, the AscTec Hummingbird quadrotor and an ackerman-steering RC car in V-REP
- Implemented code to interface with the simulator for each simulated robot using ROS, Matlab and C++ remote-API interfaces
- Integrated a C++ logger into the simulation/control code and wrote Matlab scripts to analyze log files generated by the logger

Robotics Enabled In-Home Environment Screening for Fall Risks, WPI 01/2014-05/2014

- Worked out a robotic framework for home fall risk assessment, including setting up the software for both the Turtlebot2 platform and the Gazebo simulator, adding new sensors and developing drivers, implementing a web interface based on the ”Robot Management System” to make the system accessible from a web page
- Studied the navigation of mobile robots in home environment and potential applications of robotic technologies for improving the life quality of elderly people, prepared preliminary results for proposal of further research on this topic

Intelligent Portable Aerial Surveillance System - IPASS, WPI 12/2012-05/2013

- Developed the dynamics model of the aircraft and designed controller with Matlab simulation
- Provided support to the undergraduate team of this project for improving the mechanical design of the aircraft, based on the theoretical analysis
- Evaluated different image stitching techniques to get panoramas from cameras on the aircraft

ADDITIONAL EXPERIENCE

Teaching Assistant of the Electrical and Computer Engineering Department, WPI

Real-time Embedded Systems, WPI	10/2015-12/2015
Embedded Computing in Engineering Design, WPI	08/2015-10/2015
Introduction to ECE, WPI	08/2014-10/2014
Robot Control, WPI	01/2014-05/2014
Power Electronics, WPI	10/2013-12/2013

PROFESSIONAL AFFILIATIONS

Student Member, Robotics and Automation Society, IEEE	03/2013-Present
Member, Rho Beta Epsilon Robotics Honors Society, WPI	02/2013-Present