Hesen Zhang

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Education

University of Southern California, Los Angeles, CA May 2016
Master student in Computer Science

University of Liverpool, Liverpool, United Kingdom May 2014
Bachelor Degree of Electronics Engineering

Skills

Programming Languages: C++11, C, Python, Matlab, Java, JavaScript, C#, HTML&CSS, SQL, Verilog, VHDL
Hardwares: Raspberry Pi, Intel Galileo, Arduino, FPGA(Altera DE2), Nao robot, Lego EV3 robot
Tools/Libraries/Frameworks: OpenCV, OpenGL, Vim, Latex, Django, JQuery, ROS, MRPT, Boost

Experience

Student Worker in USC Robotic Embedded Systems Laboratory, Los Angeles, CA October 2015 - Present
- Implementing Path Planning with Dead-End of Underwater Robots
- Built website for Southern California Robotics Symposium 2016
- Maintaining infrastructural codes including related utilities and functions

Internship in Chinese Academy of Sciences, Ningbo, China August 2014
Associate engineer in advanced manufacturing Laboratory, Institute Of Materials Technology and Engineering
- In participation in Brushless Direct Current Motor design, calculated desired parameters
- Designed and built peripheral circuit for unit testing on DSP(QQ2812)

Projects

Stochastic Path Planning for Underwater Robots, Los Angeles, CA Dec 2015 - Present
A Linux simulation software developed by C++, Displayed by OpenGL User Interface
- Implemented Markov Decision Processing Model and Value Iteration Solution to calculate an optimal path
- Developing Stochastic Planning Model based on Markov Chain Transition Matrix and Dead End Detecting based on Recursive First Passage Time Evaluation
- Researching on integrating fluid model developed from Navier–Stokes Equations

Smart Home Hub, Los Angeles, CA December, 2015
An embedded system on Intel Galleo II board developed by Python, and a client mobile App by Phonegap
- Implemented functions to sensing temperature, air quality, sound and light, and being able to detect fire hazard
- Supported the cloud server for providing RESTful JSON API to let the client side receiving data
- Built an mobile App to receive and display real-time data, and to remind unhealthy environment and to alarm fire

Swarm Intelligence Inspired Path Planning, Los Angeles, CA November, 2015
A Java multithreading path planing simulation program with Graphic User Interface
- Modeled and implemented the communication behaviors between robots and sensors in a limited sensible range
- Established uniform or random distributed grid-based environment and obstacles
- Built planning framework based on Reinforcement Learning(Q-Learning) and output an optimal path

Pi-Lego-Bot, Liverpool, United Kingdom March 2014
Interfaced Raspberry Pi with a Camera Module to Lego Mindstorm EV3 robot and finished several certain tasks
- Established command-line interface among Raspberry Pi, EV3 and a remote device, supporting secure communication
- Run facial detection algorithm to determine the target position in the images
- Measured distance and angle based on stereoscopic pictures taken by the camera module on the robot
- Built kinematics model and PID control model for navigation