Yang Song

2009 Greene Street
Apartment 502
Columbia, SC 29205

www.cse.sc.edu/~song24
ysong.sc@gmail.com
803-381-1667

Summary

Developed advanced planning algorithms for mobile robots. Familiar with robot dynamics and control. Experienced in robotics programming with diverse languages and libraries. Demonstrated written and verbal communication skills from teaching and research activities.

Education

University of South Carolina, Columbia, SC
Ph.D. Candidate, Computer Science — Aug. 2015

University of New Mexico, Albuquerque, NM
M.S., Electrical Engineering — Dec. 2009

China University of Geosciences, Wuhan, Hubei
B.S., Electrical Engineering — June 2007

Research Experience

South Carolina Autonomous Robotics Research Lab, USC

Distributed Formation Algorithm for Multi-Robot Systems — Aug. 2013 – present

- Innovated a distributed multi-robot lattice formation algorithm
- Conceptualized a novel graph with its edges labeled with rigid-body transformations
- Developed a ROS-based software with C++ and Python
- Designed and implemented a GUI with the GTK+ and the Boost libraries
- Supported by the National Science Foundation (NSF) grant

Planning Algorithm under Uncertainty — Aug. 2010 – May 2011

- Promoted a geometric algorithm for robot planning under uncertainty
- Implemented simulations using C++
- Achieved the same level of performance in navigation tasks as using the approach that computed the high-fidelity information states, but with a much lower computational cost
- Experimental data collection and visualization with Perl and Gnuplot
- Supported by the NSF grant

Multi-Agent, Hybrid and Embedded Systems Lab, UNM

Multi-Robot Control Algorithm — Aug. 2009

- Implemented a cyclic pursuit algorithm for nonholonomic vehicles with Matlab and C++

TXT-1 Autonomous Mobile Robot Development — Aug. 2008 – May 2009

- Tested platform hardware: PC/104 single-board computer and CAN bus circuit board
- Configured onboard system and software: Player/Stage
- Wrote documentations

Language & Tools

C/C++, Python, Ruby, Java, HTML/CSS, JavaScript, LaTeX
ROS, Git, CMake, Matlab, OpenCV, Bootstrap, Boost

Honors & Awards

NSF Student Travel Grant Award May 2014

Code-A-Thon Winner (2 out of 12 teams) Feb. 2014

Web Application Development: Shopping for Groceries Economically

- My contribution: Designed a web interface using MVC pattern and implemented the front-end with PHP and Bootstrap to show items dynamically from the database
- Supported by the Boeing Company

Teaching Experience

University of South Carolina, Columbia, SC

Lecturer Instructor

General Application Programming June 2012 – May 2014

- Taught web front-end interface design using HTML/CSS/JavaScript

Introduction to Computer Architecture Jan. 2012 – May 2012

- Taught computer architecture and MIPS programming

Teaching Assistant

Algorithmic Design I Aug. 2010 – May 2011

- Instructed problem-solving patterns, algorithmic design, and Java programming

Publications

Y. Song and J. M. O'Kane, "Decentralized formation of arbitrary multi-robot lattices", ICRA 2014.

Y. Song and J. M. O'Kane, "Comparison of constrained geometric approximation strategies for planar information states", ICRA 2012.

D. Miklic, S. Bogdan, R. Fierro, **Y. Song**, "A grid-based approach to formation reconfiguration for a class of robots with non-holonomic constraints", European Journal of Control, 2012.