Yang Song

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EDUCATION

University of South Carolina, Columbia, SC
Ph.D. Candidate, Computer Engineering   2010–2015
- Research Interests: Robotics, Planning Algorithms, Computational Geometry.
- Advisor: Dr. Jason M. O'Kane

University of New Mexico, Albuquerque, NM
M.S., Electrical Engineering   2008–2009
- Research Interests: Robotics, Control Systems, Embedded Systems.
- Advisors: Dr. Rafael Fierro

China University of Geosciences, Wuhan, Hubei
B.S., Electrical Engineering   2003–2007

RESEARCH EXPERIENCE

South Carolina Autonomous Robotics Research Lab, USC
Distributed Formation Algorithm for Multi-Robot Systems   2013–present
- Proposed a provably-correct distributed algorithm based on the task assignment algorithm to perform arbitrary lattices formation of the Multi-Robot Systems.
- Implemented the software using ROS, incorporated both C++ and Python.
- Tested the algorithm performance and scalability.
- Supported by the National Science Foundation (NSF) grant.

Planning Algorithm under Uncertainty   2010-2011
- Proposed a geometric planning algorithm to represent robot's states with uncertainty.
- Implemented and tested the algorithm using C++.
- Achieved similar performance with lower computation cost comparing with using the high-fidelity representation of robots states in navigation tasks.
- Supported by NSF grant.

Multi-Agent, Hybrid and Embedded Systems Lab, UNM
Multi-Robot Formation Control Algorithm   2008-2009
- Implemented the formation control algorithm for Multi-Robot Systems subject to nonlinear constraints using MATLAB and C++.
- Cooperated with team members to conduct experiments using Poineer-3AT robots.
- Supported by NSF grants and DOE-URPR (University Research Program in Robotics) grant.

HONORS & AWARDS

NSF Student Travel Grant Award.   2014
Code-A-Thon Winner (2 out of 12 teams).   2014
Web Application Development: Shopping for Groceries Economically
- Team work: Developed a web application providing users the optimal shopping solutions using PHP in 18 hours.
- My contribution: Implemented the web interface based on the bootstrap to show items dynamically from the database using the MVC pattern.

LANGUAGE & TOOLS	C/C++, Python, Java, Ruby, Bash, HTML/CSS, JavaScript, PHP, LaTeX ROS, Git, CMake, Matlab, OpenCV, Bootstrap

TEACHING EXPERIENCE

University of South Carolina, Columbia, SC

Lecturer Instructor 2012-2014
CSCE102 General Application Programming, SUMMER2012 − SPRING 2014
Teaching web front-end interface design using HTML/CSS/JavaScript.
CSCE212 Introduction to Computer Architecture, SPRING 2012
Teaching computer architecture and assembly-language programming (MIPS).
Teaching Assistant 2010−2011
CSCE145 Algorithmic Design I, FALL 2010, SPRING 2011
Teaching problem-solving patterns, algorithmic design, and programming in Java.

PUBLICATIONS

Y. Song and J. M. O'Kane, *"A provably-correct distributed arbitrary lattice formation algorithm for large-scale multi-robot systems"*, ICRA 2015 *(submitted)*.
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 18 (2), 162-181, 2012.