
Jason M. O'Kane

Curriculum Vitae

University of South Carolina
Department of Computer Science and Engineering

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RESEARCH INTERESTS The goal of my research is to enable robots, both individually and in teams, to operate autonomously in contexts that are unpredictable and inhospitable, while ensuring that the resulting systems are robust and inexpensive. Because sensing and uncertainty are central issues in robotics, it is essential to understand how to solve robotics problems when sensing is limited and uncertainty is great. My interests span sensor-based algorithmic robotics and related areas, including planning under uncertainty, artificial intelligence, computational geometry, sensor networks, and motion planning.

EDUCATION **Ph.D.** in Computer Science, University of Illinois, Urbana-Champaign, 2007.
Dissertation title: *A Theory for Comparing Robot Systems*
Dissertation advisor: Steven M. LaValle
M.S. in Computer Science, University of Illinois, Urbana-Champaign, 2005.
Thesis title: *Almost-Sensorless Localization*
Thesis advisor: Steven M. LaValle
B.S. *summa cum laude* in Computer Science, Taylor University, Upland, Indiana, 2001.

PROFESSIONAL EXPERIENCE **Assistant Professor**, University of South Carolina. August 2007 - present.
Research Assistant, University of Illinois. August 2002 - July 2007.
Visiting Lecturer, University of Illinois. June 2002 - August 2002.
Teaching Assistant, University of Illinois. August 2001 - May 2002.

AWARDS **Member of DARPA Computer Science Study Group** (1 of 12 awards), 2010.
National Science Foundation CAREER Award, 2010-2015.
Best Student Paper Award finalist for "On Comparing the Power of Mobile Robots," *Robotics: Science and Systems*, 2006.
Roy J. Carver Fellowship, University of Illinois, 2001-2002.
Outstanding Computer Science Graduate, Taylor University, 2001.
President's Scholarship, Taylor University, 1997-2001.

COURSES TAUGHT **Robotics** (csce574) at University of South Carolina. Spring 2008, Spring 2009, Spring 2010, Spring 2011.
Robotic Systems (csce774) at University of South Carolina. Fall 2008, Fall 2009, Fall 2011.
Algorithms and Data Structures (csce350) at University of South Carolina. Fall 2007, Fall 2010.
Computer Architecture I (cs231) at University of Illinois. Summer 2002.

PUBLICATIONS

Journal articles

- [J:05] Laura Boccanfuso, Jason M. O’Kane. CHARLIE: An Adaptive Robot Design with Hand and Face Tracking for Use in Autism Therapy. *International Journal of Social Robotics*, 2011. To appear.
- [J:04] Chase Gray, Chuan Qin, Jason M. O’Kane, Srihari Nelakuditi. Movement strategies for intelligent mobile routers. *Mobile Computing and Communications Review*, 14(2):19–21, 2010.
- [J:03] Jason M. O’Kane, Steven M. LaValle. On comparing the power of robots. *International Journal of Robotics Research*, 27(1):5–23, January 2008.
- [J:02] Jason M. O’Kane, Steven M. LaValle. Localization with limited sensing. *IEEE Transactions on Robotics*, 23:704–716, August 2007.
- [J:01] Robert Ghrist, Jason M. O’Kane, Steven M. LaValle. Computing pareto optimal coordinations on roadmaps. *International Journal of Robotics Research*, 24(11):997-1010, November 2005.

Journal articles under review

- [J:xx] Jason M. O’Kane, Nicholas M. Stiffler. On the value of ignorance: An optimal reactive strategy for privacy-preserving robotic target tracking. *Submitted to Robotica*, 2011. Under review.
- [J:xx] Wenyuan Xu, Jason M. O’Kane. Towards Energy-Efficient Robotic Target Tracking Utilizing a Network of Unreliable One-Bit Proximity Sensors. *Submitted to IEEE Transactions on Mobile Computing*, 2011. Under review.

Refereed conference papers

- [C:17] Miao Xu, Wenyuan Xu, Jason M. O’Kane. Content-Aware Data Dissemination for Enhancing Privacy and Availability in Wireless Sensor Networks. In *Proc. IEEE International Conference on Mobile Ad-hoc and Sensor Systems*, 2011. To appear.
- [C:16] Nicholas M. Stiffler, Jason M. O’Kane. Visibility-Based Pursuit-Evasion with Probabilistic Evader Models. In *Proc. IEEE International Conference on Robotics and Automation*, 2011.
- [C:15] Jason M. O’Kane. Decentralized Tracking of Indistinguishable Targets using Low-Resolution Sensors. In *Proc. IEEE International Conference on Robotics and Automation*, 2011.
- [C:14] Laura Boccanfuso, Jason M. O’Kane. Adaptive Robot-Assisted Autism Therapy Using a Robot with Hand and Face Tracking. In *Proc. International Conference on Social Robotics*, 2010.
- [C:13] Jason M. O’Kane, Wenyuan Xu. Network-assisted target tracking via smart local routing. In *Proc. IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2010.
- [C:12] Jeremy S. Lewis, Jason M. O’Kane. Guaranteed navigation with an unreliable blind robot. In *Proc. IEEE International Conference on Robotics and Automation*, 2010.

- [C:11] Jason M. O’Kane, Wenyuan Xu. Energy-efficient target tracking with a sensorless robot and a network of unreliable one-bit proximity sensors. In *Proc. IEEE International Conference on Robotics and Automation*, 2009.
- [C:10] Jason M. O’Kane. On the value of ignorance: Balancing tracking and privacy using a two-bit sensor. In *Proc. International Workshop on the Algorithmic Foundations of Robotics*, 2008.
- [C:09] Hamid Chitsaz, Steven M. LaValle, Jason M. O’Kane. Exact Pareto-optimal coordination for two translating polygonal robots on a cyclic roadmap. In *Proc. Canadian Conference on Computational Geometry*, 2008.
- [C:08] Lawrence Erickson, Joseph Knuth, Jason M. O’Kane, Steven M. LaValle. Probabilistic localization with a blind robot. In *Proc. IEEE International Conference on Robotics and Automation*, 2008.
- [C:07] Jason M. O’Kane, Steven M. LaValle. Sloppy motors, flaky sensors, and virtual dirt: Comparing imperfect ill-informed robots. In *Proc. IEEE International Conference on Robotics and Automation*, 2007.
- [C:06] Jason M. O’Kane, Steven M. LaValle. Dominance and equivalence for sensor-based agents. In *Proc. AAAI Conference on Artificial Intelligence (NECTAR track)*, 2007.
- [C:05] Jason M. O’Kane, Steven M. LaValle. On comparing the power of mobile robots. In *Proc. Robotics: Science and Systems*, 2006.
- [C:04] Jason M. O’Kane. Global localization using odometry. In *Proc. IEEE International Conference on Robotics and Automation*, 2006.
- [C:03] Jason M. O’Kane, Steven M. LaValle. Almost-sensorless localization. In *Proc. IEEE International Conference on Robotics and Automation*, 2005.
- [C:02] Robert Ghrist, Jason M. O’Kane, Steven M. LaValle. Pareto optimal coordination on roadmaps. In *Proc. International Workshop on the Algorithmic Foundations of Robotics*, 2004.
- [C:01] Hamid Chitsaz, Jason M. O’Kane, Steven M. LaValle. Exact Pareto-optimal coordination for two translating polygonal robots on an acyclic roadmap. In *Proc. IEEE International Conference on Robotics and Automation*, 2004.

Conference papers under review

- [C:xx] Laura Boccanfuso, Jason M. O’Kane. Remote Measurement of Breathing Rate Using a High Precision Single-Point Infrared Temperature Sensor. In *Submitted to IEEE International Conference on Robotics and Automation*, 2012. Under review.
- [C:xx] Jeremy S. Lewis, Jason M. O’Kane. Reliable Indoor Navigation with an Unreliable Robot: Allowing Temporary Uncertainty for Maximum Mobility. In *Submitted to IEEE International Conference on Robotics and Automation*, 2012. Under review.
- [C:xx] Yang Song, Jason M. O’Kane. Comparison of Constrained Geometric Approximation Strategies for Planar Information States. In *Submitted to IEEE International Conference on Robotics and Automation*, 2012. Under review.
- [C:xx] Nicholas M. Stiffler, Jason M. O’Kane. Shortest Paths for Visibility-Based Pursuit-Evasion. In *Submitted to IEEE International Conference on Robotics and Automation*, 2012. Under review.

Book chapter

[BC:01] Jason M. O’Kane, Benjamin Tovar, Peng Cheng, Steven M. LaValle. Algorithms for Planning Under Uncertainty in Prediction and Sensing.

Other publications

[O:03] Jason M. O’Kane. Book Review: Maja J. Mataric, *The Robotics Primer. Autonomous Agents and Multi-Agent Systems*, 17:362–365, 2008.

[O:02] Benjamin Tovar, Anna Yershova, Jason M. O’Kane, Steven M. LaValle. Information Spaces for Mobile Robots. In *Proc. International Workshop on Robot Motion and Control*, 2005.

[O:01] Jason M. O’Kane, Steven M. LaValle. Sampling-based methods for discrete planning. In *Doctoral Consortium of the International Conference on Automated Planning and Scheduling*, 2004.

PRESENTATIONS
(SELECTED)

Invited talk, “Robotic Planning with Limited Sensing”, McGill University, Centre for Intelligent Machines. Montréal, Quebec, Canada. February 18, 2011.

Invited talk, “Robotic Planning with Limited Sensing”, University of Colorado, Aerospace Engineering Sciences Department. Boulder, Colorado. December 6, 2010.

Invited talk, “Planning and Reasoning for Simple Robots” Clemson University, Department of Electrical and Computer Engineering. Clemson, South Carolina. October 28, 2010.

Invited talk, “Robotic target tracking using incomplete information,” University of Nevada at Reno, Computer Science Department. Reno, Nevada. July 26, 2010.

Invited talk, “Robotic planning with limited sensing,” University of North Carolina Charlotte, Computer Science Department. Charlotte, North Carolina. February 27, 2009.

Invited talk, “Planning with Limited Sensing: Localization, Tracking, and Privacy,” Workshop on Topology and Minimalism in Robotics and Sensor Networks, Eidgenössische Technische Hochschule Zürich (ETHZ), Zürich, Switzerland, June 28, 2008.

Invited talk, “Computing Challenges in Robotics,” Benedict College, Mathematics and Computer Science Department. Columbia, South Carolina. March 7, 2008.

Invited talk, “Fun with minimalism: Roomba, localization, and robot dominance,” DARPA STOMP regional meeting. Chicago, Illinois. May 7, 2007.

Invited talk, “Planning and Analysis for Robot Systems with Limited Sensing,” Department of Computer Science and Engineering, University of South Carolina. Columbia, South Carolina. April 30, 2007.

Invited talk, “Almost-Sensorless Localization,” Northwestern University, Department of Mechanical Engineering. Evanston, Illinois. April 11, 2005.

Invited talk, “Minimalist Robots: Simple Designs for Complex Behavior,” Taylor University, Computing and System Sciences Department. Upland, Indiana. April 4, 2004.

FUNDING
(CURRENT)

“Algorithms for Minimalist Robot Teams,” National Science Foundation, 2010. \$464,466.

FUNDING (COMPLETED)	<p>“Computing Pursuit and Capture Strategies for Sensing-Limited Agents,” University of South Carolina, Office of Research and Health Sciences Research Funding Program. 2008–2009. \$21,515.</p> <p>“Computer Science Study Panel,” Defense Advanced Research Projects Agency (DARPA), 2010. \$99,957.</p> <p>“Adaptive Robot-Assisted Therapy for Autistic Children,” South Carolina Developmental Disabilities Council, 2010. \$15,080.</p>
UNIVERSITY SERVICE	<p>At University of South Carolina:</p> <p>Graduate Committee, 2007 - present.</p> <p>Chair Search Committee, 2010.</p> <p>Faculty Search Committee, 2010 - present.</p>
PROFESSIONAL SERVICE	<p>Program Committee, Robotics: Science and Systems, 2008, 2010.</p> <p>Associate Editor, ICRA Conference Editorial Board, 2009-2011.</p> <p>Associate Editor, IROS Conference Editorial Board, 2011.</p> <p>Reviews for National Science Foundation, 2009-2011.</p>
REVIEWS	<p>Automatica, 2005.</p> <p>AAAI National Conference on Artificial Intelligence, 2006.</p> <p>ACM Symposium on Computational Geometry, 2005, 2009.</p> <p>IEEE Conference on Decision and Control, 2007.</p> <p>IEEE International Conference on Automation Science and Engineering, 2010.</p> <p>IEEE International Conference on Robotics and Automation, 2004, 2006–2010.</p> <p>IEEE/RSJ International Conference on Intelligent Robots and Systems, 2005, 2008, 2010.</p> <p>IEEE Transactions on Robotics, 2007, 2009, 2010.</p> <p>IEEE Transactions on Robotics and Automation, 2004.</p> <p>IEEE Transactions on Automation Science and Engineering, 2008, 2010.</p> <p>Journal of Artificial Intelligence Research, 2010.</p> <p>Journal of Intelligent and Robotic Systems, 2009, 2010.</p> <p>Journal of Information Science and Engineering, 2009.</p> <p>International Journal of Robotics Research, 2004, 2008.</p> <p>International Symposium on Visual Computing, 2007.</p> <p>Intelligent Service Robotics, 2010.</p> <p>Robotics: Science and Systems, 2005–2008, 2010.</p> <p>Theory of Computing Systems, 2010.</p> <p>Workshop on the Algorithmic Foundations of Robotics, 2004, 2006.</p> <p>Wireless Communications and Mobile Computing, 2008.</p>
PROFESSIONAL SOCIETIES	<p>Current:</p> <p>Institute of Electrical and Electronics Engineers (IEEE), 2004 – present.</p> <p>IEEE Robotics and Automation Society (RAS), 2004 – present.</p> <p>Past:</p> <p>Association for the Advancement of Artificial Intelligence (AAAI), 2007.</p> <p>Society for Industrial and Applied Mathematics (SIAM), 2004 – 2007.</p>

CITIZENSHIP United States