
Jason M. O'Kane

Curriculum Vitæ

University of South Carolina
Department of Computer Science and Engineering

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RESEARCH INTERESTS

The goal of my research is to push robots into 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

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

PUBLICATIONS

Journal articles

- [1] Jason M. O'Kane and Steven M. LaValle. On comparing the power of robots. *International Journal of Robotics Research*, 27(1):5–23, January 2008.
- [2] Jason M. O'Kane and Steven M. LaValle. Localization with limited sensing. *IEEE Transactions on Robotics*, 23:704–716, August 2007.

- [3] Robert Ghrist, Jason M. O’Kane, and Steven M. LaValle. Computing pareto optimal coordinations on roadmaps. *International Journal of Robotics Research*, 24(11):997–1010, November 2005.

Refereed conference papers

- [4] 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. To appear.
- [5] Hamid Chitsaz, Steven M. LaValle, and Jason M. O’Kane. Exact Pareto-optimal coordination for two translating polygonal robots on a cyclic roadmap. In *Canadian Conference on Computational Geometry*, 2008.
- [6] Lawrence Erickson, Joseph Knuth, Jason M. O’Kane, and Steven M. LaValle. Probabilistic localization with a blind robot. In *Proc. IEEE International Conference on Robotics and Automation*, 2008.
- [7] Jason M. O’Kane and 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.
- [8] Jason M. O’Kane and Steven M. LaValle. Dominance and equivalence for sensor-based agents. In *Proc. AAAI Conference on Artificial Intelligence (NECTAR track)*, 2007.
- [9] Jason M. O’Kane and Steven M. LaValle. On comparing the power of mobile robots. In *Proc. Robotics: Science and Systems*, 2006.
- [10] Jason M. O’Kane. Global localization using odometry. In *Proc. IEEE International Conference on Robotics and Automation*, 2006.
- [11] Jason M. O’Kane and Steven M. LaValle. Almost-sensorless localization. In *Proc. IEEE International Conference on Robotics and Automation*, 2005.
- [12] Robert Ghrist, Jason M. O’Kane, and Steven M. LaValle. Pareto optimal coordination on roadmaps. In *Proc. International Workshop on the Algorithmic Foundations of Robotics*, pages 185–200, 2004.
- [13] Hamid Chitsaz, Jason M. O’Kane, and 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*, pages 3981–3986, 2004.

Conference paper under review

- [14] Jason M. O’Kane and 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. Under review.

Book chapter

- [15] Jason M. O’Kane, Benjamin Tovar, Peng Cheng, and Steven M. LaValle. Algorithms for planning under uncertainty in prediction and sensing. In S. S. Ge and F. L. Lewis, editors, *Autonomous Mobile Robots: Sensing, Control, Decision-Making, and Applications*, Series in Control Engineering, chapter 13, pages 501–547. Marcel Dekker, 2006.

Other publications

- [16] Jason M. O’Kane. Book review: Maja J. Matarić, *The Robotics Primer. Autonomous Agents and Multi-Agent Systems*, 17:362–365, 2008.
- [17] Benjamin Tovar, Anna Yershova, Jason M. O’Kane, and Steven M. LaValle. Information spaces for mobile robots. In *Proc. International Workshop on Robot Motion and Control*, 2005.
- [18] Jason M. O’Kane and Steven M. LaValle. Sampling-based methods for discrete planning. In *Doctoral Consortium of the International Conference on Automated Planning and Scheduling*, 2004.

- PRESENTATIONS 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.
- Paper presentation, “Dominance and Equivalence for Sensor-Based Agents,” at the AAAI Conference on Artificial Intelligence. Vancouver, Canada. July 25, 2007.
- 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.
- Paper presentation, “Sloppy motors, flaky sensors, and virtual dirt: Comparing imperfect ill-informed robots,” at the IEEE International Conference on Robotics and Automation. Rome, Italy. April 13, 2007.
- Paper presentation, “On Comparing the Power of Mobile Robots,” at Robotics: Science and Systems. Philadelphia, Pennsylvania. August 16, 2006.
- Paper presentation, “Global Localization Using Odometry,” at the IEEE International Conference on Robotics and Automation. Orlando, Florida. May 16, 2006.
- Paper presentation, “Almost-Sensorless Localization,” at the IEEE International Conference on Robotics and Automation. Barcelona, Spain. April 11, 2005.
- 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.
- Paper presentation, “Exact Pareto-Optimal Coordination of Two Polygonal Robots on an Acyclic Roadmap,” at the IEEE International Conference on Robotics and Automation. New Orleans, Louisiana. April 30, 2004.

- FUNDING “ROP: 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.

- UNIVERSITY SERVICE At University of South Carolina:
Graduate Committee, 2007 - present.

- PROFESSIONAL SERVICE Program Committee, Robotics: Science and Systems, 2008.
Associate Editor, ICRA Conference Editorial Board, 2009.
- REVIEWS Automatica, 2005.
AAAI National Conference on Artificial Intelligence, 2006.
ACM Symposium on Computational Geometry, 2005.
IEEE Conference on Decision and Control, 2007.
IEEE International Conference on Robotics and Automation, 2004, 2006–2008.
IEEE/RSJ International Conference on Intelligent Robots and Systems, 2005,
2008.
IEEE Transactions on Robotics, 2007.
IEEE Transactions on Robotics and Automation, 2004.
IEEE Transactions on Automation Science and Engineering, 2008.
International Journal of Robotics Research, 2004.
International Symposium on Visual Computing, 2007.
Robotics: Science and Systems, 2005–2008.
Workshop on the Algorithmic Foundations of Robotics, 2004, 2006.
Wireless Communications and Mobile Computing, 2008.
- PROFESSIONAL SOCIETIES Current:
Institute of Electrical and Electronics Engineers (IEEE), 2004 – present.
IEEE Robotics and Automation Society (RAS), 2004 – present.
Past:
Association for the Advancement of Artificial Intelligence (AAAI), 2007.
Society for Industrial and Applied Mathematics (SIAM), 2004 – 2007.