

# Stephen L. Smith

## 1 Personal Data

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Canada

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## 2 Education

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- Sept 2005 – Aug 2009     **PhD in Mechanical Engineering**  
University of California, Santa Barbara, CA
- Sept 2003 – Nov 2005     **MASc in Electrical and Computer Engineering**  
University of Toronto, Toronto, ON
- Sept 1999 – May 2003     **BASc in Engineering Physics**  
Queen's University, Kingston, ON

## 3 Employment History

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### 3.1 Academic Appointments

- July 2016 – present     **Associate Professor**  
Department of Electrical and Computer Engineering  
University of Waterloo, Waterloo, ON
- Mar 2011 – June 2016     **Assistant Professor**  
Department of Electrical and Computer Engineering  
University of Waterloo, Waterloo, ON
- Sept 2009 – Mar 2011     **Postdoctoral Associate**  
Computer Science & Artificial Intelligence Laboratory  
Massachusetts Institute of Technology, Cambridge, MA

### 3.2 Sabbatical Appointments

- Sept 2014 – Dec 2014     **Visiting Assistant Professor**  
Department of Mechanical Engineering  
University of California, Santa Barbara, CA

## 4 Awards and Recognitions

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- 2016     NSERC Discovery Accelerator Supplement  
(125 recipients among 3,000 applicants in Canada)
- 2016     Outstanding Performance Award, University of Waterloo  
(1 of 22 recipients in the Faculty of Engineering)
- 2016     Early Researcher Award, Ministry of Research and Innovation  
(Highly-competitive funding to early career researchers at Ontario institutions)
- 2015     Nominated for Engineering Research Excellence Awards, University of Waterloo  
(1 nominee at assistant professor level in ECE)

2014	Keynote speaker at SEMTE Controls Symposium at Arizona State University (4 keynote speakers at invited symposium)
2007, 2008, 2013	Best Presentation in Session, American Control Conference
2007	Best Student Paper Award Finalist, IEEE Conf. on Decision and Control (4 finalists in ~ 1000 papers)
2005 – 2007	NSERC Canada Graduate Scholarship ( <i>Declined</i> to study in US)
2003 – 2005	NSERC PGS A Graduate Scholarship
2003 – 2005	Canadian Space Agency NSERC Supplement
2003 – 2004	Gordon M. MacNabb Scholarship ( <i>National Award</i> )
2002 – 2003	Carl Reinhardt Scholarship, Queen’s University
2002 – 2003	NSERC Undergraduate Student Research Award
2000 – 2003	Queen’s University Dean’s Award Scholarship
2001 – 2002	Alexander MacPhail Scholarship, Queen’s University

## 5 Consulting and Technology Transfer

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2013 – present	<b>Senior Research Advisor</b> RideCo, Waterloo, ON ( <a href="https://www.rideco.com/">https://www.rideco.com/</a> ) <ul style="list-style-type: none"> <li>• RideCo provides door-to-door shared rides for urban transportation</li> <li>• Company has raised \$2.5 million in seed funding since 2014</li> <li>• Dr. Smith and his team developed core routing and scheduling optimization</li> </ul>
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## 6 Professional Service

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### SOCIETY MEMBERSHIPS:

2014 – present	Professional Engineers of Ontario, <b>Member (P.Eng.)</b>
2005 – present	Institute of Electrical and Electronics Engineers (IEEE), <b>Senior Member</b> as of May 2015
2005 – present	Control Systems Society (CSS), Member
2005 – present	Robotics and Automation Society (RAS), Member

### ASSOCIATE EDITOR DUTIES:

2015 – present	IEEE/RSJ International Conference on Intelligent Robots and Systems
2014 – present	IEEE International Conference on Robotics and Automation
2013 – present	IEEE Control Systems Society Conference Editorial Board Serve as AE for two largest annual control conferences: <ul style="list-style-type: none"> <li>• IEEE American Control Conference</li> <li>• IEEE Conference on Decision and Control</li> </ul>

### TECHNICAL PROGRAM COMMITTEE MEMBER:

2012 – 2017	Robotics: Science & Systems Conference (RSS)
2012 – 2016	Workshop on the Algorithmic Foundations of Robotics (WAFR)
2014 – 2016	International Symposium on Distributed Autonomous Robotic Systems (DARS)
2016	IEEE International Conference on Simulation, Modeling, and Programming for Autonomous Robots (SIMPAN)

2012 – 2014            Conference on Computer and Robot Vision (CRV)  
2012 – 2014            Canadian Conference on Electrical and Computer Engineering

CONFERENCE WORKSHOPS ORGANIZED:

2011                    “Dynamic Vehicle Routing for Robotic Systems”  
Robotics: Science & Systems, Los Angeles, CA  
2010                    “Dynamic Vehicle Routing for Robotic Systems”  
American Control Conference, Baltimore, MD

CHAIR OF CONFERENCE SESSION:

2016                    “Autonomous Robots II,” *IEEE Conference on Decision and Control*, Las Vegas, NV  
2016                    “Agent-based Systems II,” *American Control Conference*, Boston, MA  
2016                    “Autonomous Systems I,” *American Control Conference*, Boston, MA  
2014                    “Optimization I,” *IEEE Conference on Decision and Control*, Los Angeles, CA  
2014                    “Kalman Filtering,” *American Control Conference*, Portland, OR  
2014                    “Estimation I,” *American Control Conference*, Portland, OR  
2013                    “Optimization I,” *American Control Conference*, Washington, DC  
2012                    “Oral Session 7,” *WAFR*, Cambridge, MA  
2011                    “Multirobot Coordination & Robots,” *IEEE/RSJ IROS*, San Francisco, CA  
2010                    “Navigation IV,” *IEEE/RSJ IROS*, Taipei, Taiwan

RECOGNITION FOR REVIEW SERVICE:

2014                    Awarded best reviewer for Robotics: Science and Systems Conference  
(3 awards among 286 reviewers)

EXTERNAL GRANT REVIEW:

2016                    Czech Research Foundation, Cybernetics and Information Processing.  
2016                    NSERC Applied Research and Development Grant.  
2014                    MITACS Accelerate Internship Program.  
2013 – 2014            Canada Foundation for Innovation, Leaders Opportunity Fund.  
2013                    Qatar National Research Fund, National Priorities Program.  
2012                    US National Science Foundation, Cyber-Physical Systems Program.

## 7 Student Supervision

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### 7.1 Graduate Student Supervision

CURRENT GRADUATE STUDENTS:

2016 – present            Chuanzheng Wang (PhD: co-advised) “Distributed Optimization and Control”  
2016 – present            Nils Wilde (PhD: co-advised) “Human-in-the-Loop Robot Motion Planning”  
2016 – present            Armin Sadeghi (PhD) “Multi-robot Coordination and Routing”  
2016 – present            Ahmad Bilal Asghar (PhD) “Estimation and Scheduling in Sensor Networks”  
2016 – present            Michael Zechmair (MAsc) “Monte-Carlo Tree Search for Motion Planning”  
2015 – present            Ryan Andrew MacDonald (MAsc) “Persistent Multi-Robot Systems”

2015 – present Stanislav Bochkarev (MASC) “Sweep Coverage for Robotic Cleaning”  
 2013 – present Frank Imeson (PhD) “Languages for complex motion tasks”

**FORMER GRADUATE STUDENTS:**

2014 – 2016 Armin Sadeghi (MASC) “Robot Task Allocation and Sequencing”  
*Currently:* PhD Student at Waterloo

2015 – 2016 Haotian Zhang (PhD: co-advised) “Estimation of Uncertain Systems”

2013 – 2015 Ahmad Bilal Asghar (MASC) “Stochastic Robotic Patrolling”  
*Currently:* PhD Student at Waterloo

2012 – 2014 Neil Matthew (MASC: co-advised) “Recharging in persistent tasks”  
*Currently:* Co-founder, Vertical, Mountain View, CA

2011 – 2013 Syed Talha Jawaid (MASC) “Informative path planning”  
*Currently:* Engineer at National Instruments, Austin, TX

2012 – 2013 Elaheh Fata (MASC: co-advised) “Dominating set problems”  
*Currently:* PhD Student at MIT

2012 – 2013 Philip McCarthy (MASC: co-advised) “Robust observer design”  
*Currently:* PhD Student at Waterloo

2010 – 2013 Alphan Ulusoy (PhD: co-advised) “Motion control with timing”  
*Currently:* Senior Engineer, The Math Works

2010 – 2011 Daniel Soltero (MASC: co-advised) “Persistent robotic monitoring”  
*Currently:* Engineer at Apple Inc.

2009 – 2011 Jana Tumova (PhD: co-advised) “Formal methods in path planning”  
*Currently:* Assistant Professor at KTH, Sweden

**7.2 Undergraduate Student Supervision**

Fall 2016 Alexandru Blidaru, “Human-robot interaction in motion planning”  
*Currently:* Undergraduate student at Waterloo

Fall 2016 Yingzi Zhang, “Machine learning for adaptive robot motion”  
*Currently:* Undergraduate student at Waterloo

Spring 2016 Shamak Dutta, “Generalized traveling salesman with overlapping sets”  
*Currently:* Undergraduate student at Waterloo

Fall 2015 Edward Wang, “Benchmarking for the generalized traveling salesman”  
*Currently:* Undergraduate student at Waterloo

2014 – 2015 Jamie Waugh, “Optimization for mobility-on-demand systems”  
*Currently:* Master’s student at Waterloo

2013 – 2014 Sebastian Schweigert, “Simulating public transportation wait-times”  
*Currently:* Robotics Engineer at BobSweep

Fall 2013 Andrew Perkins, “Urban mobility simulation environment”

Spring 2013 Zhaowei Wang, “Rebalancing policies with real-world data”  
*Currently:* Master’s student at Univ. of Toronto

2012 – 2013 Danson Evan Garcia, “Rebalancing for in urban mobility”

Fall 2012	Joao Pedro Battistella Nadas, “Monitoring robotic network” <i>Currently: Analyst at GVT Telecom</i>
Spring 2012	Mohammadreza Memarian, “Multi-agent robotic testbed” <i>Currently: Master’s student at Waterloo</i>
Spring 2012	Zhixu Han, “Docking strategies for robotic coverage” <i>Currently: Master’s student at Waterloo</i>

### 7.3 Other Student Supervision

#### CO-OP STUDENT SUPERVISION:

2015	Oluwasefunmi Osinaike (E-Coop) “Time management assistant”
2013	Ali Ali Mahmoud (E-Coop) “Automating factory systems”
2013	Han Xu (Waterloo Co-op) “Test Instances for carshare commuting”
2013	Jordan Longstaff (Waterloo Co-op) “Interface design for ride-sharing”
2012	Ross McCandless (UCEP) “Data analysis for future transportation”

#### CAPSTONE DESIGN PROJECT SUPERVISION:

2015	Oluwasefunmi Osinaike (E-Coop) “Time management assistant”
2013	Ali Ali Mahmoud (E-Coop) “Automating factory systems”
2013	Han Xu (Waterloo Co-op) “Test Instances for carshare commuting”
2013	Jordan Longstaff (Waterloo Co-op) “Interface design for ride-sharing”
2012	Ross McCandless (UCEP) “Data analysis for future transportation”

#### CAPSTONE DESIGN PROJECT SUPERVISION:

2016 – present	ECE: Pursuit: The Self-Following Smart Suitcase
2016 – present	ECE: LowCast – crowdsourced software app for podcasts
2014 – 2015	ECE: Improved Touch Surface Projection System
2013 – 2014	ECE: Leg Motion Monitoring System
2013 – 2014	ECE: The Robotic Arm Project
2011 – 2013	ECE: Reduced Footprint Mobility System (Telus Best Presentation Award)
2011 – 2013	ECE: Distributed Robotics System
2011 – 2013	ECE: Motion Controlled Quad-copter
2011 – 2012	ECE: Cooperative Control Vehicular System

## 8 Courses Taught

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Spring 2016	ECE 380: Analog Control Systems (Sec 001) Course Critique Score: 94/100
Spring 2016	ECE 380: Analog Control Systems (Sec 002) Course Critique Score: 95/100
Winter 2016	ECE 406: Algorithm Design and Analysis Course Critique Score: 96/100
Spring 2015	ECE 780 T08: Motion Coordination & Planning Course Critique Score: 95/100
Winter 2015	ECE 406: Algorithm Design and Analysis Course Critique Score: 95/100
Winter 2015	ECE 380: Analog Control Systems

	Course Critique Score: 92/100
Winter 2015	ECE 300A: ECE Practice Course Critique Score: N/A
Winter 2014	ECE 406: Algorithm Design and Analysis Course Critique Score: 98/100
Spring 2013	ECE 486: Robot Dynamics and Control Course Critique Score: 99/100
Spring 2013	ECE 780 T08: Motion Coordination & Planning Course Critique Score: 88/100
Winter 2013	ECE 406: Algorithm Design and Analysis Course Critique Score: 98/100
Winter 2013	ECE 300A: ECE Practice Course Critique Score: N/A
Spring 2012	ECE 780 T08: Motion Coordination & Planning Course Critique Score: 85/100
Winter 2012	ECE 380: Analog Control Systems Course Critique Score: 94/100
Spring 2011	ECE 780 T08: Motion Coordination & Planning Course Critique Score: 91/100

## 9 Publications

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*Note:* In the list of publications, trainees are underlined.

### 9.1 Refereed Journal Publications

- [J1] A. B. Asghar, S. T. Jawaid, and S. L. Smith. “A Complete Greedy Algorithm for Infinite-Horizon Sensor Scheduling”. In: *Automatica* (Aug. 2016). Revised and submitted, Manuscript No. 16-0327, 9 pages.
- [J2] A. Sadeghi and S. L. Smith. “Decentralized Large Neighborhood Search for Task Allocation in Heterogeneous Systems”. In: *Unmanned Systems* (2016). Manuscript No. US-D-16-00013, 16 pages, Submitted July 2016.
- [J3] S. L. Smith and F. Imeson. “GLNS: An Effective Large Neighborhood Search Heuristic for the Generalized Traveling Salesman Problem”. In: *Computers & Operations Research* (Aug. 2016). Revised and submitted, Manuscript No. COR-D-16-00332, 16 pages.
- [J4] N. Mathew, S. L. Smith, and S. L. Waslander. “Multi-robot Rendezvous Planning for Recharging in Persistent Tasks”. In: *IEEE Transactions on Robotics* 31.1 (2015), pp. 128–142.
- [J5] N. Mathew, S. L. Smith, and S. L. Waslander. “Planning Paths for Package Delivery in Heterogeneous Multi-Robot Teams”. In: *IEEE Transactions on Automation Science and Engineering* 12.4 (2015), pp. 1298–1308.
- [J6] S. T. Jawaid and S. L. Smith. “Informative Path Planning as a Maximum Traveling Salesman Problem with Submodular Rewards”. In: *Discrete Applied Mathematics* 186 (2015), pp. 112–127.
- [J7] S. T. Jawaid and S. L. Smith. “Submodularity and Greedy Algorithms in Sensor Scheduling for Linear Dynamical Systems”. In: *Automatica* 61 (2015), pp. 282–288.
- [J8] S. D. Bopardikar, S. L. Smith, and F. Bullo. “On Dynamic Vehicle Routing with Time Constraints”. In: *IEEE Transactions on Robotics* 30.6 (2014), pp. 1524–1532.
- [J9] X. C. Ding, S. L. Smith, C. Belta, and D. Rus. “Optimal Control of Markov Decision Processes with Linear Temporal Logic Constraints”. In: *IEEE Transactions on Automatic Control* 59.5 (2014), pp. 1244–1257.

- [J10] S. Alamdari, E. Fata, and S. L. Smith. “Persistent Monitoring in Discrete Environments: Minimizing the Maximum Weighted Latency Between Observations”. In: *International Journal of Robotics Research* 33.1 (2014), pp. 138–154.
- [J11] A. Ulusoy, S. L. Smith, X. C. Ding, C. Belta, and D. Rus. “Optimality and Robustness in Multi-Robot Path Planning with Temporal Logic Constraints”. In: *International Journal of Robotics Research* 32.8 (2013), pp. 889–911.
- [J12] M. Pavone, S. L. Smith, E. Frazzoli, and D. Rus. “Robotic Load Balancing for Mobility-on-Demand Systems”. In: *International Journal of Robotics Research* 31.7 (2012), pp. 839–854.
- [J13] S. L. Smith, M. Schwager, and D. Rus. “Persistent Robotic Tasks: Monitoring and Sweeping in Changing Environments”. In: *IEEE Transactions on Robotics* 28.2 (2012), pp. 410–426.
- [J14] S. D. Bopardikar, S. L. Smith, and F. Bullo. “On Vehicle Placement to Intercept Moving Targets”. In: *Automatica* 47.9 (2011), pp. 2067–2074.
- [J15] F. Bullo, E. Frazzoli, M. Pavone, K. Savla, and S. L. Smith. “Dynamic Vehicle Routing for Robotic Systems”. In: *Proceedings of the IEEE* 99.9 (2011), pp. 1482–1504.
- [J16] R. N. Smith, M. Schwager, S. L. Smith, D. Rus, and G. S. Sukhatme. “Persistent Ocean Monitoring with Underwater Gliders: Adapting Sampling Resolution”. In: *Journal of Field Robotics* 28.5 (2011), pp. 714–741.
- [J17] S. L. Smith, J. Tůmová, C. Belta, and D. Rus. “Optimal Path Planning for Surveillance with Temporal Logic Constraints”. In: *International Journal of Robotics Research* 30.14 (2011), pp. 1695–1708.
- [J18] S. D. Bopardikar, S. L. Smith, F. Bullo, and J. P. Hespanha. “Dynamic Vehicle Routing for Translating Demands: Stability Analysis and Receding-Horizon Policies”. In: *IEEE Transactions on Automatic Control* 55.11 (2010), pp. 2554–2569.
- [J19] S. L. Smith, M. Pavone, F. Bullo, and E. Frazzoli. “Dynamic Vehicle Routing with Priority Classes of Stochastic Demands”. In: *SIAM Journal on Control and Optimization* 48.5 (2010), pp. 3224–3245.
- [J20] S. L. Smith and F. Bullo. “Monotonic Target Assignment for Robotic Networks”. In: *IEEE Transactions on Automatic Control* 54.9 (2009), pp. 2042–2057.
- [J21] S. L. Smith and F. Bullo. “The Dynamic Team Forming Problem: Throughput and Delay for Unbiased Policies”. In: *Systems & Control Letters* 58.10-11 (2009), pp. 709–715.
- [J22] S. L. Smith, M. E. Broucke, and B. A. Francis. “Curve Shortening and the Rendezvous Problem for Mobile Autonomous Robots”. In: *IEEE Transactions on Automatic Control* 52.6 (2007), pp. 1154–1159.
- [J23] S. L. Smith, M. E. Broucke, and B. A. Francis. “A Hierarchical Cyclic Pursuit Scheme for Vehicle Networks”. In: *Automatica* 41.6 (2005), pp. 1045–1053.

## 9.2 Books

- [B1] F. Bullo and S. L. Smith. *Lectures on Robotic Planning and Kinematics*. Available at <https://ece.uwaterloo.ca/~s12smith/book-1rpk/>. Signed Publishing Contract. SIAM: Society for Industrial and Applied Mathematics, 2016, 210 pages.

## 9.3 Refereed Conference Publications

- [C1] A. B. Asghar and S. L. Smith. “Stochastic Patrolling Strategies in Adversarial Settings”. In: *American Control Conference*. Boston, MA, July 2016, pp. 6435–6440.
- [C2] A. Sadeghi and S. L. Smith. “On Efficient Computation of Shortest Dubins Paths Through Three Consecutive Points”. In: *IEEE Conf. on Decision and Control*. Accepted Jul. 2016. Las Vegas, NV, Dec. 2016.

- [C3] B. Ghahsifard and S. L. Smith. “On Distributed Submodular Maximization with Limited Information”. In: *American Control Conference*. Boston, MA, July 2016, pp. 1048–1053.
- [C4] R. MacDonald and S. L. Smith. “Reactive Motion Planning in Uncertain Environments via Mutual Information Policies”. In: *Workshop on Algorithmic Foundations of Robotics*. Accepted Sept. 2016. Berkeley, CA, Dec. 2016, 16 pages.
- [C5] S. Bochkarev and S. L. Smith. “On Minimizing Turns in Robot Coverage Path Planning”. In: *IEEE Conference on Automation Science and Engineering*. Fort Worth, TX, Aug. 2016, pp. 986–991.
- [C6] F. Imeson and S. L. Smith. “Multi-Robot Task Planning and Sequencing using the SAT-TSP Language”. In: *IEEE Int. Conf. on Robotics and Automation*. Seattle, WA, May 2015, pp. 5397–5402.
- [C7] A. B. Asghar and S. L. Smith. “Robot Monitoring for the Detection and Confirmation of Stochastic Events”. In: *IEEE Conf. on Decision and Control*. Los Angeles, CA, Dec. 2014, pp. 408–413.
- [C8] F. Imeson and S. L. Smith. “A Language For Robot Path Planning in Discrete Environments: The TSP with Boolean Satisfiability Constraints”. In: *IEEE Int. Conf. on Robotics and Automation*. Hong Kong, China, May 2014, pp. 5772–5777.
- [C9] N. Mathew, S. L. Waslander, and S. L. Smith. “Optimal Path Planning in Cooperative Heterogeneous Multi-robot Delivery Systems”. In: *Workshop on Algorithmic Foundations of Robotics*. Istanbul, Turkey, Aug. 2014, 16 pages.
- [C10] P. J. McCarthy, C. Neilsen, and S. L. Smith. “Cardinality Constrained Robust Optimization Applied to a Class of Interval Observers”. In: *American Control Conference*. Portland, OR, June 2014, pp. 5337–5342.
- [C11] S. T. Jawaid and S. L. Smith. “A Complete Algorithm for the Infinite Horizon Sensor Scheduling Problem”. In: *American Control Conference*. Portland, OR, June 2014, pp. 437–442.
- [C12] S. T. Jawaid and S. L. Smith. “On the Submodularity of Sensor Scheduling for Estimation of Linear Dynamical Systems”. In: *American Control Conference*. Portland, OR, June 2014, pp. 4139–4144.
- [C13] E. Fata, S. Sundaram, and S. L. Smith. “Distributed Dominating Sets on Grids”. In: *American Control Conference*. Washington, DC, June 2013, pp. 211–216.
- [C14] N. Mathew, S. L. Smith, and S. L. Waslander. “A Graph-Based Approach to Multi-Robot Rendezvous for Recharging in Persistent Tasks”. In: *IEEE Int. Conf. on Robotics and Automation*. Karlsruhe, Germany, May 2013, pp. 3482–3487.
- [C15] P. J. McCarthy, C. Neilsen, and S. L. Smith. “A Nonlinear Impulsive Observer for Diesel Engine Emissions Reduction”. In: *American Control Conference*. Washington, DC, June 2013, pp. 1065–1070.
- [C16] S. T. Jawaid and S. L. Smith. “The Maximum Traveling Salesman Problem with Submodular Rewards”. In: *American Control Conference*. Washington, DC, June 2013, pp. 4003–4008.
- [C17] S. L. Smith, M. Pavone, M. Schwager, E. Frazzoli, and D. Rus. “Rebalancing the Rebalancers: Optimally Routing Vehicles and Drivers in Mobility-on-Demand Systems”. In: *American Control Conference*. Washington, DC, June 2013, pp. 2368–2373.
- [C18] A. Ulusoy, S. L. Smith, and C. Belta. “Optimal Multi-Robot Path Planning with LTL Constraints: Guaranteeing Correctness Through Synchronization”. In: *Int. Symp. on Distributed Autonomous Robotic Systems*. Baltimore, MD, Nov. 2012, 14 pages.
- [C19] A. Ulusoy, S. L. Smith, X. C. Ding, and C. Belta. “Robust Multi-Robot Optimal Path Planning with Temporal Logic Constraints”. In: *IEEE Int. Conf. on Robotics and Automation*. St. Paul, MN, May 2012, pp. 4693–4698.
- [C20] B. J. Julian, S. L. Smith, and D. Rus. “Distributed Approximation of Joint Measurement Distributions Using Mixtures of Gaussians”. In: *Robotics: Science and Systems*. Sydney, Australia, July 2012, 8 pages.
- [C21] S. Alamdari, E. Fata, and S. L. Smith. “Min-Max Latency Walks: Approximation Algorithms for Monitoring Vertex-Weighted Graphs”. In: *Workshop on Algorithmic Foundations of Robotics*. Cambridge, MA, June 2012, 16 pages.



- [C22] A. Ulusoy, S. L. Smith, X. C. Ding, C. Belta, and D. Rus. “Optimal Multi-Robot Path Planning with Temporal Logic Constraints”. In: *IEEE/RSJ Int. Conf. on Intelligent Robots & Systems*. San Francisco, CA, Sept. 2011, pp. 3087–3092.
- [C23] D. E. Soltero, S. L. Smith, and D. Rus. “Collision Avoidance in Trajectory Tracking for Multi-Robot Persistent Tasks”. In: *IEEE/RSJ Int. Conf. on Intelligent Robots & Systems*. San Francisco, CA, Sept. 2011, pp. 3645–3652.
- [C24] X. C. Ding, S. L. Smith, C. Belta, and D. Rus. “LTL Control in Uncertain Environments with Probabilistic Satisfaction Guarantees”. In: *IFAC World Congress*. Electronic proceedings. Milan, Italy, Aug. 2011, 8 pages. DOI: 10.3182/20110828-6-IT-1002.02287.
- [C25] X. C. Ding, S. L. Smith, C. Belta, and D. Rus. “MDP Optimal Control under Temporal Logic Constraints”. In: *IEEE Conf. on Decision and Control*. Orlando, FL, Dec. 2011, pp. 532–538.
- [C26] M. Pavone, S. L. Smith, E. Frazzoli, and D. Rus. “Load Balancing for Mobility-on-Demand Systems”. In: *Robotics: Science and Systems*. Los Angeles, CA, June 2011, 8 pages.
- [C27] R. N. Smith, M. Schwager, S. L. Smith, D. Rus, and G. S. Sukhatme. “Persistent Ocean Monitoring with Underwater Gliders: Towards Accurate Reconstruction of Dynamic Ocean Processes”. In: *IEEE Int. Conf. on Robotics and Automation*. Shanghai, China, May 2011, pp. 1517–1524.
- [C28] S. L. Smith, M. Schwager, and D. Rus. “Persistent Monitoring of Dynamic Environments using a Robot with Limited Range Sensing”. In: *IEEE Int. Conf. on Robotics and Automation*. Shanghai, China, May 2011, pp. 5448–5455.
- [C29] S. D. Bopardikar, S. L. Smith, and F. Bullo. “Vehicle Placement to Intercept Moving Targets”. In: *American Control Conference*. Baltimore, MD, June 2010, pp. 5538–5543.
- [C30] S. L. Smith and D. Rus. “Multi-Robot Monitoring in Dynamic Environments with Guaranteed Currency of Observations”. In: *IEEE Conf. on Decision and Control*. Atlanta, GA, Dec. 2010, pp. 514–521.
- [C31] S. L. Smith, J. Tůmová\*, C. Belta, and D. Rus. “Optimal Path Planning under Temporal Constraints”. In: *IEEE/RSJ Int. Conf. on Intelligent Robots & Systems*. Taipei, Taiwan, Oct. 2010, pp. 3288–3293.
- [C32] S. D. Bopardikar, S. L. Smith, F. Bullo, and J. P. Hespanha. “Dynamic vehicle routing with moving demands – Part I: Low speed demands and high arrival rates”. In: *American Control Conference*. St. Louis, MO, June 2009, pp. 1454–1459.
- [C33] M. Pavone, S. L. Smith, F. Bullo, and E. Frazzoli. “Dynamic multi-vehicle routing with multiple classes of demands”. In: *American Control Conference*. St. Louis, MO, June 2009, pp. 604–609.
- [C34] S. L. Smith, S. D. Bopardikar, and F. Bullo. “A Dynamic Boundary Guarding Problem with Translating Targets”. In: *IEEE Conf. on Decision and Control*. Shanghai, China, Dec. 2009, pp. 8543–8548.
- [C35] S. L. Smith, S. D. Bopardikar, F. Bullo, and J. P. Hespanha. “Dynamic vehicle routing with moving demands – Part II: High speed demands or low arrival rates”. In: *American Control Conference*. St. Louis, MO, June 2009, pp. 1466–1471.
- [C36] S. L. Smith and F. Bullo. “Dynamic Multi-Agent Team Forming: Asymptotic Results on Throughput Versus Delay”. In: *American Control Conference*. Seattle, WA, June 2008, pp. 1406–1411.
- [C37] S. L. Smith, M. Pavone, F. Bullo, and E. Frazzoli. “Dynamic Vehicle Routing with Heterogeneous Demands”. In: *IEEE Conf. on Decision and Control*. Cancun, Mexico, Dec. 2008, pp. 1206–1211.
- [C38] S. L. Smith and F. Bullo. “Target Assignment for Robotic Networks: Asymptotic Performance Under Limited Communication”. In: *American Control Conference*. New York, NY, July 2007, pp. 1155–1160.
- [C39] S. L. Smith and F. Bullo. “Target Assignment for Robotic Networks: Worst Case and Stochastic Performance in Dense Environments”. In: *IEEE Conf. on Decision and Control*. New Orleans, LA, Dec. 2007, pp. 3585–3590.

- [C40] S. L. Smith, M. E. Broucke, and B. A. Francis. “Stabilizing a Multi-Agent System to an Equilateral Polygon Formation”. In: *Mathematical Theory of Networks and Systems*. Kyoto, Japan, July 2006, pp. 2415–2424.
- [C41] S. L. Smith, M. E. Broucke, and B. A. Francis. “Curve shortening and its application to multi-agent systems”. In: *IEEE Conf. on Decision and Control and European Control Conference*. Seville, Spain, Dec. 2005, pp. 2817–2822.

#### 9.4 Appeared Book Chapters

- [BC1] S. L. Smith and F. Bullo. “A Geometric Assignment Problem for Robotic Networks”. In: *Modeling, Estimation and Control: Festschrift in honor of Giorgio Picci on the occasion of his sixty-fifth Birthday*. Ed. by A. Chiiso, A. Ferrante, and S. Pinzoni. Lecture Notes in Control and Information Sciences. Springer, 2007, pp. 271–284.

#### 9.5 Theses

- [T1] S. L. Smith. “Task Allocation and Vehicle Routing in Dynamic Environments”. PhD thesis. Department of Mechanical Engineering, University of California at Santa Barbara, Aug. 2009.
- [T2] S. L. Smith. “Strategies for Rendezvous and Formation Stabilization of Multi-Agent Systems”. MA thesis. Department of Electrical Engineering, University of Toronto, Aug. 2005.

#### 9.6 Invited Talks

- [P1] *Balancing Expressivity and Efficiency in Robot Path Planning Languages*. Australian Centre for Field Robotics. University of Sydney, Sydney, Australia, Apr. 2016.
- [P2] *Multi-Robot Task Allocation and Sequencing: Distributed Algorithms for General Tasks*. Workshop on Taxonomies of Interconnected Systems: Asymmetric Interactions in Distributed Robotics. IEEE International Conference on Robotics and Automation, May 2015.
- [P3] *Balancing Expressivity and Efficiency in Robot Path Planning Languages*. GRASP Lab Special Seminar. University of Pennsylvania, Philadelphia, PA, Nov. 2014.
- [P4] *Greedy Algorithms and Submodularity in Sensor Scheduling Problems*. Sixth Biennial Meeting on Systems and Control. University of Waterloo, Waterloo, ON, May 2014.
- [P5] *Robot Path Planning and Recharging in Persistent Monitoring Operations*. Aeronautics and Astronautics Seminar. Stanford University, Stanford, CA, Apr. 2014.
- [P6] *The Role of Submodularity and Greedy Algorithms in Sensor Scheduling Problems*. SEMTE Controls Symposium. Arizona State University, Tempe, AZ, Dec. 2014.
- [P7] *The Role of Submodularity and Greedy Algorithms in Sensor Scheduling Problems*. Cymer Center for Control Systems and Dynamics Seminar. University of California San Diego, La Jolla, CA, Nov. 2014.
- [P8] *Validation of Mobility-on-Demand Rebalancing on Real World Data*. Workshop on Vehicle Autonomy in Urban Transportation Systems. IEEE Conference on Robotics and Automation, Karlsruhe, Germany, May 2013.
- [P9] *Challenges and Autonomy for Mobility-On-Demand Systems*. Workshop on Autonomy for Urban Transportation. National University of Singapore, Singapore, Aug. 2012.
- [P10] *Optimizing Motion for Robotic Monitoring and Information Gathering*. Applied Mathematics Control Seminar. University of Waterloo, Waterloo, ON, Nov. 2012.
- [P11] *Optimizing Motion for Robotic Monitoring and Information Gathering*. CISE Seminar Series. Boston University, Boston, MA, Sept. 2012.

- [P12] *Optimizing Robotic Motion for Complex and Dynamic Tasks*. Mechanical Engineering Seminar Series. University of California, Santa Barbara CA, Oct. 2011.
- [P13] *Persistent Tasks for Robots in Changing Environments*. Workshop on 3D Exploration, Mapping, and Surveillance with Aerial Robots. Robotics: Science and Systems, Los Angeles, CA, July 2011.
- [P14] *Planning with Temporal Constraints*. SMARTS Review Meeting. MIT, Cambridge, MA, Dec. 2011.
- [P15] *Robots on-demand: Optimizing Motion for Dynamic and Complex Tasks*. ECE Seminar Series. University of Toronto, Toronto ON, Mar. 2011.
- [P16] *Adaptive Coverage in Challenging Environments*. ANTIDOTE Review Meeting. University of Southern California, Los Angeles, CA, Aug. 2010.
- [P17] *Communication Constrained Task Allocation For Robotic Networks*. Theory of Distributed Systems Group. MIT, Cambridge, MA, Mar. 2010.
- [P18] *Task Allocation and Vehicle Routing in Dynamic Environments*. Mechanical Engineering Seminar Series. University of Michigan, Ann Arbor, MI, Mar. 2010.
- [P19] *Task Allocation and Vehicle Routing in Dynamic Environments*. Australian Centre for Field Robotics. University of Sydney, Sydney, Australia, Jan. 2010.
- [P20] *Autonomous Task Allocation and Vehicle Routing in Dynamic Environments*. Computer Science & Artificial Intelligence Lab. MIT, Cambridge, MA, July 2009.
- [P21] *Autonomous Task Allocation and Vehicle Routing in Dynamic Environments*. Mechanical and Aerospace Engineering Seminar. Princeton University, Princeton, NJ, July 2009.
- [P22] *Autonomous Task Allocation and Vehicle Routing in Dynamic Environments*. Electrical Engineering Seminar. Yale University, New Haven, CT, July 2009.
- [P23] *Autonomous Task Allocation and Vehicle Routing in Dynamic Environments*. Aeronautical and Astronautical Engineering Seminar. MIT, Cambridge, MA, Apr. 2009.
- [P24] *Static and Dynamic Target Assignment*. SWARM Review Meeting. University of Pennsylvania, Philadelphia, PA, July 2008.
- [P25] *A Geometric Assignment Problem for Robotic Networks*. Southern California Nonlinear Control Workshop. University of California, Los Angeles, CA, June 2007.

## 9.7 Coverage in Press

- [M1] Waterloo Engineering News Office. *Funding will help team develop plug-and-play robots*. Aug. 2016. URL: <https://uwaterloo.ca/engineering/news/funding-will-help-team-develop-plug-and-play-robots>.
- [M2] MIT News Office. *New algorithm finds best routes for one-way car sharing*. June 2013. URL: <http://web.mit.edu/newsoffice/2013/algorithm-finds-best-routes-for-one-way-car-sharing-0624.html>.
- [M3] MIT News Office. *Speeding swarms of sensor robots*. May 2011. URL: <http://web.mit.edu/newsoffice/2011/robot-algorithm-0503.html>.

## 10 University Service

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### PHD DEFENSE COMMITTEE MEMBER:

2016	Ammar Alzaydi, MME, University of Waterloo
2016	Ali Hesammohseni, ECE, University of Waterloo
2016	Ebrahim Moradi Shahrivar, ECE, University of Waterloo
2015	Alireza Doosthoseini, ECE, University of Waterloo
2015	Steven McFadden, ECE, University of Waterloo (delegate)
2013	Juan Carlos Munoz Guerrero, ECE, University of Waterloo
2013	Nima Mousavi, ECE, University of Waterloo
2012	Lin Yuheng, Mechanical Engineering, National University of Singapore

### PHD COMPREHENSIVE EXAM COMMITTEE MEMBER:

2016	Ronghuai Qi, MME, University of Waterloo
2016	Vladimir Joukov, ECE, University of Waterloo
2016	Nahid Juma, ECE, University of Waterloo
2016	Burak Can Yildiz, MSCI, University of Waterloo (Exam Chair)
2015	Mohamed Haytham Ahmed, ECE, University of Waterloo (Exam Chair)
2015	Behrooz Golzarpoor, CIVEE, University of Waterloo (Exam Chair)
2014	Haotian Zhang, ECE, University of Waterloo
2014	Ebrahim Moradi Shahrivar, ECE, University of Waterloo
2014	Ali Sarhadi, CIVEE, University of Waterloo (Exam Chair)
2014	Ali Hesammohseni, ECE, University of Waterloo
2013	Biao Wang, MSCI, University of Waterloo (Exam Chair)
2013	Ammar Alzaydi, Mechanical Engineering, University of Waterloo
2013	Alireza Doosthoseini, ECE, University of Waterloo
2012	Nima Mousavi, ECE, University of Waterloo

### DEPARTMENT AND FACULTY COMMITTEES:

2016 – present	Departmental Advisory Committee on Appointments
2014 – 2016	Engineering Faculty Council Member
2011 – 2015	Graduate Scholarships Committee, ECE
2012 – 2014	Graduate Research Seminars Committee, ECE

### OTHER UNIVERSITY SERVICE:

2014, 2016	Mentor for ExpecTations Workshop
2012, 2013, 2016	ECE 499: Engineering Project, Course Coordinator
2013	Capstone Design Project Judge, Mechanical and Mechatronics
2011 – 2013	Capstone Design Project Judge, Electrical and Computer Eng.