Alexander James Wallar

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Education

Ph.D. Electrical Engineering and Computer Science — Sept 2017 – present
Massachusetts Institute of Technology, Cambridge, MA
Advisor: Prof. Daniela Rus

S.M. Electrical Engineering and Computer Science — Sept 2015 – June 2017
Massachusetts Institute of Technology, Cambridge, MA
Advisor: Prof. Daniela Rus
GPA: 5.0/5.0

B.Sc. (Honours) Computer Science — Sept 2012 – June 2015
University of St Andrews, St Andrews, Scotland
First Class Honours Degree Classification

Experience

Research Scientist Intern — May 2016 – Aug 2016
Research and Development Group
Amazon Robotics, Boston
- Analyzed and developed algorithms for drive prioritization in order to reduce floor congestion

Research Scientist (Contractor) — Jan 2015 – Aug 2015
Distributed Autonomous Systems Group
Naval Research Laboratory, Washington DC
- Developed algorithms for multi-agent persistent surveillance of risk sensitive areas

Undergraduate Research Assistant — Aug 2013 – Aug 2015
Computational Robotics Laboratory
The Catholic University of America, Various Locations
- Developed path planning algorithms for swarms

Research Intern — May 2014 – Aug 2014
Distributed Autonomous Systems Group
Naval Research Laboratory, Washington DC
- Developed algorithms for persistent surveillance and collision avoidance

NSF Research Intern — May 2013 – Aug 2013
Experiment Research in Wireless Networking Group
University of Notre Dame, South Bend
- Created a JavaScript library for in-browser eye tracking and gaze prediction

Publications

1. **A. Wallar**, B. Araki, R. Chang, J. Alonso-Mora, and D. Rus (2017): Foresight: Remote Sensing For Autonomous Vehicles Using a Small Unmanned Aerial Vehicle. *Field and Service Robotics*, in press
2. J. Alonso-Mora, **A. Wallar**, and D. Rus (2017): Predictive Routing for Autonomous Mobility-On-Demand Systems with Ride-Sharing. *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, in press
3. J. Alonso-Mora, S. Samaranayake, **A. Wallar**, E. Frazzoli, and D. Rus (2017): On-demand High-capacity Ride-sharing via Dynamic Trip-vehicle Assignment. *Proceedings of the National Academy of Sciences*, vol. 114, no. 3, pp. 462–467

4. **A. Wallar**, E. Plaku, and D. Sofge (2015): Reactive Motion Planning for Unmanned Aerial Surveillance of Risk-Sensitive Areas. *IEEE Transactions on Automation Science and Engineering*, vol. 12, issue 3, pp. 969 – 980
5. D. Sofge, N. Sydney, **A. Wallar**, and K. Sullivan (2015): Mobile Autonomous Navy Teams for Information Surveillance and Search (MANTISS). *Naval Research Laboratory Review*, pp. 155–157
6. **A. Wallar** and E. Plaku (2014): Path Planning for Swarms in Dynamic Environments by Combining Probabilistic Roadmaps and Potential Fields. *IEEE Symposium on Swarm Intelligence*
7. **A. Wallar**, E. Plaku, and D. Sofge (2014): A Planner for Autonomous Risk-Sensitive Coverage (PARCov) by a Team of Unmanned Aerial Vehicles. *IEEE Symposium on Swarm Intelligence*
8. **A. Wallar** A and E. Plaku (2014): Path Planning for Swarms by Combining Probabilistic Roadmaps and Potential Fields. *Springer LNAI Towards Autonomous Robotic Systems*, vol. 8069, pp. 417 – 428

Theses

1. **A. Wallar** (2017): On-demand High-capacity Ride-sharing via Dynamic Trip-Vehicle Assignment with Rebalancing. S.M. Thesis. Massachusetts Institute of Technology
2. **A. Wallar** (2015): Generating Safe Trajectories in Stochastic Dynamic Environments by Leveraging Information About Obstacle Motion. Undergraduate Thesis. University of St Andrews

Posters & Presentations

1. N. Sydney, **A. Wallar**, D. Sofge (2015): Distributed Information-Theoretic Target Detection Using Physics-Inspired Motion Coordination. *8th International Symposium on Resilient Control Systems*
2. **A. Wallar**, E. Plaku, and D. Sofge (2014): Risk Sensitive Surveillance with Optimal Sensor Quality for Distributed Robotic Systems. *Entrepreneur First UnHacked*
3. **A. Wallar** A, C. Poellabauer, A. Sazonovs, and P. Flynn (2014): Camgaze.js: A JavaScript Library for Eye Tracking and Gaze Prediction. *Edinburgh University Young Scientific Researchers Association (EUYSRA) Conference*
4. **A. Wallar**, C. Choi, and A. Sazonovs (2013): Bowtie: In-browser Mobile Aided Sensor Acquisition using HTML5. *Scottish Informatics and Computer Science Alliance (SICSA) DemoFest*
5. **A. Wallar**, C. Poellabauer, A. Sazonovs, and P. Flynn (2013): Camgaze.js: A JavaScript Library for Eye Tracking. *Scottish Informatics and Computer Science Alliance (SICSA) DemoFest*

Awards

- School of Engineering Lemelson Presidential Fellowship, MIT, 2015 – 16
- Office of the Dean of Graduate Education Diversity Fellowship, MIT, 2015 – 16
- Best Paper Award Nominee, Symposium Series on Computational Intelligence, 2014
- Dean's List, University of St Andrews, 2012 – 15
- Best Poster Prize, University of Notre Dame NSF REU Conference, 2013
- Winner, J.P. Morgan Code for Good Hackathon, 2013

Courses

Massachusetts Institute of Technology: Advances in Computer Vision, Advanced Algorithms, Computer Networks, User Interface Design and Implementation

University of St Andrews: Foundations of Computation (Accelerated), Advanced Programming Projects, Advanced Computer Science, Discrete Mathematics, Software Engineering, Data Encoding, Operating Systems, Computational Complexity, Artificial Intelligence, Component Technology, Major Software Team Project, Video Games, Artificial Intelligence Practice, Logic and Software Verification, Knowledge Discovery and Data Mining, Distributed Systems, Constraint Programming, Major Software Project