Alexander James Wallar

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SUMMARY

I am studying Computer Science at the University of St Andrews in Scotland and will be graduating in June 2015. I am a student contractor at the Naval Center for Applied Research in Artificial Intelligence at the Naval Research Laboratory and a research assistant at in the Computational Robotics Laboratory at the Catholic University of America. Starting September 2015, I will be a Ph.D. candidate in the Distributed Robotics Laboratory at MIT.

EDUCATION

Ph.D. Electrical Engineering and Computer Science   Starting September 2015
Massachusetts Institute of Technology   Cambridge, Massachusetts
> Will be working under the supervision of Dr. Daniela Rus as part of the Distributed Robotics Laboratory working on algorithms for multi-agent surveillance and persistent monitoring.

B.Sc. (Honours) Computer Science   September 2012 – June 2015
University of St Andrews   St Andrews, Scotland
> Direct entry into second year. First class honours degree (expected).
> Dissertation Title: Generating Safe Trajectories in Stochastic Dynamic Environments by Leveraging Information About Obstacle Motion.

International Baccalaureate Diploma   September 2011 – June 2012
George Mason High School   Falls Church, Virginia
> Extended Essay Title: To What Extent Can Numbers of Different Bases be Used to Hide Information Effectively?

EXPERIENCE

Student Contractor   January 2015 – Present
Naval Research Laboratory   Washington DC, USA
> Working as part of the Distributed Autonomous Systems Group at the Naval Center for Applied Research in Artificial Intelligence developing algorithms for multi-agent surveillance and persistent monitoring. Also developing middlewares that provide abstractions for controlling multi-agent systems

Undergraduate Research Assistant   August 2013 – Present
The Catholic University of America   Various Locations
> Working as part of the Computational Robotics Laboratory developing algorithms for swarm manipulation that seek to enable a group of unmanned aerial vehicles to provide surveillance over a given region. Also creating path planning algorithms for swarms that generate paths through cluttered dynamic environments for a swarm.

Research Intern   May 2014 – August 2014
Naval Research Laboratory   Washington DC, USA
> Was selected as part of the Naval Research Enterprise Internship Program. Worked as part of the Distributed Autonomous Systems Group at the Naval Center for Applied Research in Artificial Intelligence and developed algorithms for surveillance of risk sensitive areas by a team of unmanned aerial vehicles.

Research Assistant   February 2014 – October 2015
School of Computer Science, University of St Andrews   St Andrews, Scotland

> Worked with Dr. Juan Ye to develop computer vision techniques to produce haptic feedback from two dimensional images.

Research Intern   September 2013 – June 2014
University of Notre Dame   Notre Dame, USA

> Was selected as part of the National Science Foundation Research Experience for Undergraduates program. Developed web applications for concussion detection. Also developed a framework for in browser eye tracking and gaze prediction.

High School Research Intern   September 2013 – June 2014
The Catholic University of America   Washington DC, USA

> Created an interface for controlling an iRobot Create using voice commands spoken to an Android enabled device. Also developed algorithms for swarm path planning that enabled a group of robots to move from an initial configuration to a goal configuration.

Intern   July 2011 – August 2011
Embassy of the United States   Bucharest, Romania

> Worked with the Financial Management Office to provide assistance including managing spreadsheets for payment and shredding papers.

AWARDS

Fellowships & Grants

- School of Engineering Lemelson Presidential Fellowship, MIT
- Office of the Dean of Graduate Education Diversity Fellowship, MIT
- Symposium Series on Computational Intelligence Travel Grant, IEEE

Academic Prizes & Recognition

- Best Paper Award Nominee, Symposium Series for Computational Intelligence
- Dean's List, University of St Andrews
- Best Poster Prize, University of Notre Dame

Hackathons

- Second place, KCL Tech Society HackKing's Hackathon
- Finalist, Barclays Openminds Hackathon
- First place, J.P. Morgan Code for Good Hackathon
- Second place, University of Edinburgh Security Appathon
- Third place, University College London Hackin' the City

Professional Affiliations	- Student Member, IEEE - Student Member, IEEE Computational Intelligence Society - Student Member, IEEE Robotics and Automation Society

Positions of Responsibility	• Class Representative, University of St Andrews	September 2014 – Present
	• President, St Andrews Computing Society	May 2013 – June 2014

Technical Interests
Swarm Robotics, Emergent Behaviour, Complex Systems, Autonomous Systems, Path Planning, Aerial Robotics, Artificial Intelligence, Computational Intelligence, Evolutionary Algorithms, Robotic Middleware, Stochastic Planning, Sampling Based Motion Planning, Evolutionary Robotics, Swarm Intelligence, Consensus Filtering, Mapping, Surveillance, Search & Rescue, Game Theory

Programming Languages
Python, C, C++, Java, JavaScript, Matlab, Go, C#, Maple, Mathematica, Haskell

Programming Libraries
ROS, OpenCV, ZeroMQ, Flask, NumPy, MatPlotLib, OpenKinect

Publications

Peer-reviewed

1. Sofge D, Sydney N, **Wallar A**, and Sullivan K (2015): **"Mobile Autonomous Navy Teams for Information Surveillance and Search (MANTISS)."**,Naval Research Laboratory Review, in press

2. **Wallar A**, Plaku E, and Sofge D (2014): **"Motion Planning for Surveillance of Risk-Sensitive Areas by a Team of Unmanned Aerial Vehicles."**, IEEE Transactions on Automation Science and Engineering, under review (submitted August 2014)

3. **Wallar A** and Plaku E (2014): **"Path Planning for Swarms in Dynamic Environments by Combining Probabilistic Roadmaps and Potential Fields."**, IEEE Symposium on Swarm Intelligence

4. **Wallar A**, Plaku E, and Sofge D (2014): **"A Planner for Autonomous Risk-Sensitive Coverage (PARCov) by a Team of Unmanned Aerial Vehicles."**, IEEE Symposium on Swarm Intelligence

5. **Wallar A** and Plaku E (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. **Wallar A** (2015): **"Generating Safe Trajectories in Stochastic Dynamic Environments by Leveraging Information About Obstacle Motion"**, Undergraduate Thesis, University of St Andrews

Posters & Presentations

1. **Wallar A**, Plaku E, and Sofge D (2014): **Risk Sensitive Surveillance with Optimal Sensor Quality for Distributed Robotic Systems**, Entrepreneur First UnHacked, London, UK

2. **Wallar A**, Poellabauer C, Sazonovs A, and Flynn P (2014): **Camgaze.js: A JavaScript Library for Eye Tracking and Gaze Prediction**, Edinburgh University Young Scientific Researchers Association (EUYSRA) Conference, Edinburgh, UK

3. **Wallar A**, Choi C, and Sazonovs A (2013): **Bowtie: In-browser Mobile Aided Sensor Acquisition using HTML5**, Scottish Informatics and Computer Science Alliance (SICSA) DemoFest, Glasgow, UK

4. **Wallar A**, Poellabauer C, Sazonovs A, and Flynn P (2013): **Camgaze.js: A JavaScript Library for Eye Tracking**, Scottish Informatics and Computer Science Alliance (SICSA) DemoFest, Glasgow, UK