Alex Wallar *July 23, 1994*

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Summary

I am studying Computer Science at the University of St Andrews in Scotland and will be graduating in 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 in the Computational Robotics Laboratory at the Catholic University of America. During term time, I am a research assistant for the School of Computer Science at the University of St Andrews.

Education

University of St Andrews — St Andrews, Scotland

B.Sc (Hons) Computer Science, Direct entry into second year, First Class (Expected) *2012 – 2015*

Focussed on artificial intelligence and path planning. My dissertation is about path planning in highly cluttered dynamic environments using obstacle trajectory prediction

George Mason High School — Falls Church, Virginia

International Baccalaureate Diploma & Advanced Virginia Diploma *2011 – 2012*

Focussed on science and mathematics. My dissertation was about using numbers of different bases for cryptography

Experience

Distributed Autonomous Systems Group, Naval Research Laboratory — Washington DC

Student Contractor *May '14 – Aug '14*

Developing algorithms for multi-agent systems that provide surveillance over a given area using topological maps of the environment. Also working on path planning algorithms for swarms in highly cluttered dynamic environments.

Naval Research Enterprise Internship Program Research Intern *May '14 – Aug '14*

Working on algorithms for swarm manipulation that seek to enable a group of unmanned aerial vehicles to coordinate with one another to provide surveillance over a designated region and track potential targets.

Computational Robotics Group, The Catholic University of America — St Andrews & Washington DC

Undergraduate Research Assistant *Aug '13 – Oct '14*

Developing various robotic motion planning algorithms for single and multi-vehicle applications such as surveillance, discrete problem solving, and search & rescue.

High School Research Assistant *Jun '12 – Aug '12*

Created interfaces to control the iRobot Create. One application was deployed on an Android device that would allow voice control of the robot. Another used the Microsoft Kinect to drive the robot by gathering data on hand position and interpreting it to drive commands. I also developed a motion planning algorithm to plan the movement of a swarm through a known environment.

University of St Andrews — St Andrews, Scotland

Research Assistant, School of Computer Science *Feb '14 – present*

Working on "Perceiving Pictures Through Touch: A Haptic Interface for Communicating Form". Creating a system that translates monocular images into an intensity measurement for haptic response.

Research Assistant, School of Psychology *Sep '13 – Jun '14*

Configure a novel experimental setup that involves 3 active-shutter 3D displays of different sizes that can be viewed simultaneously through beam splitters.

Experimental Research in Wireless Networking Group, University of Notre Dame — Notre Dame, IN

National Science Foundation Research Intern *May '13 – Aug '13*

Worked on an web application to test if a user has a concussion. Specifically, this app measures a user's coordination, memory, cognition, balance, and reflexes. The data collected from the application is pushed to a database. A researcher or proctor is able to visualize the data by visiting a page on the website. I also created Camgaze.js, a computer vision library for in-browser eye tracking and gaze prediction written in JavaScript.

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, in press

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, in press

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

Posters and 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

Positions of Responsibility

Class Representative, University of St Andrews — *Sep '14 – present*

President, St Andrews Computing Society — *May '13 – Jun '14*

Secretary, St Andrews Nerf Society — *May '13 – Jun '14*

Vice President, George Mason Computer Science Club — *Sep '11 – Jun '12*

Skills

Programming Languages: Python, C, C++, Java, JavaScript, Matlab, Go, C#

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

Languages: English (*Native proficiency*), Spanish (*Full working proficiency*)

Interests

Technical: 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

Personal: Football (Soccer), Travelling, Music

Awards

Individual Awards

Dean's List, University of St Andrews
NSF Best Poster Prize, University of Notre Dame
Mathematics Achievement Award, George Mason High School
Principal's Scholar, George Mason High School
International Baccalaureate Learner Profile Award, American International School of Bucharest
Athlete of the Year, Central and Eastern European School Association
Most Valuable Player, FIRST Tech Challenge Robotics, Bucharest

Team Awards

Runner Up, KCL Tech Society HackKing's Hackathon
Finalist, Barclays Openminds
Winner, J.P. Morgan Code For Good
Runner Up, University of Edinburgh Security Appathon
Third Place, University College London Hackin' the City
Gracious Professionalism Award, FIRST Robotics Competition, Washington DC
Inspire Award, FIRST Tech Challenge Robotics, Bucharest
Rockwell Collins Innovate Award, FIRST Tech Challenge Robotics, Bucharest
PTC Design Award, FIRST Tech Challenge Robotics, Bucharest