Donald Arthur Sofge

Distributed Autonomous Systems Group Lead
Laboratory for Autonomous Systems Research
U.S. Naval Research Laboratory
Washington, DC, 20375
USA
don.sofge@nrl.navy.mil

Research and Professional Experience

Don Sofge is a Roboticist at the Naval Research Laboratory (NRL) with 30 years of experience in Artificial Intelligence, Machine Learning, and Control Systems R&D. He leads the Distributed Autonomous Systems Group in the Navy Center for Applied Research in Artificial Intelligence (NCARAI), where he develops nature-inspired computing paradigms to challenging problems in sensing, artificial intelligence, and control of autonomous robotic systems. He has served as PI/Co-PI on dozens of federally-funded R&D efforts, and has approximately 125 refereed publications in robotics, artificial intelligence, machine learning, planning, sensing, control, and related disciplines, and one patent on virtual state estimation for semiconductor fabrication. His current research focuses on control of autonomous teams or swarms of heterogeneous robotic systems. He has served as an advisor on autonomous systems to DARPA, ONR, OSD, ARL, NSF, and NASA, as well as US representative on international TTCP and NATO technical panels on autonomous systems, and has participated as a member of the following Interagency Working Groups under the National Science and Technology Council (NSTC) Networking and Information Technology Research and Development (NITRD) Program: Intelligent Robotics and Autonomous Systems (IRAS) (formerly Robotics and Intelligent Systems), Machine Learning and Artificial Intelligence (MLAI), and AI R&D Ad Hoc Group. Mr. Sofge also serves as an Adjunct Faculty Member at the University of Maryland through the Office of Advanced Engineering Education (OAEE) where he developed and teaches the graduate-level course *Robot Learning* as an elective for the OAEE Master of Engineering program in Robotics.

Work Experience

7/01-Present Computer Scientist (Robotics), Distributed Autonomous Systems Group Lead, Navy Center for Applied Research in Artificial Intelligence (NCARAI), Naval Research Laboratory (NRL), USA

Key Research Areas:

- Control of Teams and Swarms of Autonomous Systems
- Machine Learning and Representations (e.g. NNs, SVMs, ensembles, CNNs)

Professional Activities:

- Member of White House OSTP National Science Technology Council NITRD Program Interagency Working Groups *Intelligent Robotics and Autonomous Systems (IRAS), Machine Learning and Artificial Intelligence (MLAI), and Artificial Intelligence (AI)*
- Technical Advisor to OSD Defense Science Board 2015 Summer Study on Autonomy
- Technical Advisor and Reviewer for ONR, DARPA, OSD, NASA, Army, and NSF
- US Representative on TTCP and NATO technical panels on autonomy
- Postdoc Mentor for ASEE and NRC

- Organizer for Symposia and Workshops each year (2007-Present) on various topics including *Verification of Autonomous Systems*, *Many-Robot Systems*, *Trust in Autonomous Systems* and *Quantum Interaction*
- Peer Reviewer for various Journals and Technical Conferences in Robotics, Computational Intelligence, and Quantum Information Science
- Guest Editor, *Autonomous Robots Journal*: Special Issue on Robot Communication Challenges: Real-World Problems, Systems, and Methods (2019).
- Guest Editor, *AI Magazine*: Special Issue on Computational Context (2019)
- Associate Guest Editor, *IEEE Transactions on Automation Science and Engineering*: Special Issue on Networked Cooperative Autonomous Systems (July 2015)
- Guest Editor, *International Journal of Distributed Sensor Networks: Distributed Mobile Sensor Networks for Hazardous Applications* (April 2012)
- Member of the Editorial Board of the *Journal on Advances in Intelligent Systems,* and Reviewer for *Mathematical Reviews*

1999 – 2001 Director of Control System Development, GreyPilgrim Inc.
1991 – 1999 Senior Researcher and Vice-President of Engineering, NeuroDyne Inc.
1991 – 1993 Visiting Scientist, Artificial Intelligence Laboratory, MIT
1988 – 1991 Neural Network Engineer, McDonnell Douglas Corporation

Education

M.S. 1988 Electrical Engineering (Computer), University of Florida
B.S. 1986 Math. Sci. (Computer Science), University of North Florida

Publications

Edited Books

Artificial Intelligence for the Internet of Everything, 1st Edition, Academic Press (an imprint of Elsevier), 2019.
Computational Context: The Value, Theory and Application of Context with AI, CRC Press (a division of Taylor & Francis), 2018.
Autonomy and Artificial Intelligence: A Threat or Savior?, Editor, Springer International Publishing AG, 2017.
Robust Intelligence and Trust in Autonomous Systems, Editor, Springer International Publishing AG, 2016.
Quantum Interaction, Proceedings of the Third Quantum Interaction Symposium (QI-2009), Editor, LNAI5494, Springer, 2009.
Quantum Interaction, Proceedings of the Second Quantum Interaction Symposium (QI-2008), Editor, College Publications, UK, 2008.
Handbook of Intelligent Control**:** Neural, Fuzzy, and Adaptive Approaches, Editor, Van Nostrand Reinhold, 1992.

Book Chapters

Preface, Computational Context: The Value, Theory and Application of Context with AI, CRC Press, 2018.
Introduction, Computational Context: The Value, Theory and Application of Context with AI, CRC Press, 2018.
Cyber-(in)Security, context and theory: Proactive Cyber-Defenses, Computational Context: The Value, Theory and Application of Context with AI, CRC Press, 2018.
Introduction, Autonomy and Artificial Intelligence: A Threat or Savior?, Chapter 1, Springer International Publishing AG, 2017.

Evaluations: Autonomy and Artificial Intelligence: A Threat or Savior?, Autonomy and Artificial Intelligence, Chapter 13, Springer International Publishing AG, 2017.

Conservation of Information (COI): Geospatial and Operational Developments in E-Health and Telemedicine for Virtual and Rural Communities, Handbook of Research on Developments in e-Health and Telemedicine, IGI Global, 2009.

Applying an Organizational Uncertainty Principle: Semantic Web-Based Metrics, Handbook of Research on Social Dimensions of Semantic Technologies and Web Services, IGI Global, 2009.

An Approach to Intelligent Identification and Control of Nonlinear Dynamical Systems, Neural Adaptive Control Technology, Chapter 9, World Scientific, pp. 265-284, 1996.

Applied Learning-Optimal Control for Manufacturing, Handbook of Intelligent Control**:** Neural, Fuzzy, and Adaptive Approaches, Chapter 9, New York: Van Nostrand Reinhold, pp. 259-282, 1992.

Neural network based control for composite manufacturing, Intelligent Processing of Materials, New York: ASME Publications, 1990.

Journal and Magazine Articles

Artificial Intelligence (AI), Autonomy and Human-Machine Teams: Interdependence, Context, and Explainable AI, *AI Magazine Special Issue on Computational Context*, AAAI, 2019.

Introduction to 2nd Set of Articles in the Special Issue: Artificial Intelligence (AI), Autonomy and Human-Machine Teams: Interdependence, Context, and Explainable AI, *AI Magazine Special Issue on Computational Context*, AAAI, 2019.

Coordinating Underwater Vehicle Teams to Conduct Large-Scale Geospatial Tasks, *IEEE Journal of Oceanic Engineering*, IEEE, 2019. (under review)

A Probabilistic Approach for Real-Time Control Over the Cloud, in *Autonomous Robots (Special Issue)*, 2019. (under review)

Auctions for Multi-Robot Task Allocation in Communication Limited Environments, In *Autonomous Robots (Special Issue on Multi-Robot Systems)*, IEEE, 2019.

Extending the Life of Legacy Robots: MDS-Ach, In *Advances in Science, Technology and Engineering Systems Journal*, Vol. 4, No. 1, pp. 50-72, 2019, ASTES.

Motion Localization with Optic Flow for Autonomous Robot Teams and Swarms, *Journal of Computer and Communications*, Vol. 6, pp. 265-274, Scientific Research Publishing, 2018.

Multipass Target Search in Natural Environments, *Sensors*, MDPI (Multidisciplinary Digital Publishing Institute), 2017.

Competitive Target Search with Multi-Agent Teams: Symmetric and Asymmetric Communication Constraints, *Autonomous Robots*, 2017.

AAAI Spring 2017 Symposium: Computational Context: Why It's Important, What It Means, and Can It Be Computed?, AAAI SSS 2017 Summaries, *AI Magazine*, 2017.

Decision Forests for Machine Learning Classification of Large, Noisy Seafloor Feature Sets, *Journal of Computers & Geosciences*, Elsevier, 2017.

Mobile Autonomous Navy Teams for Information Surveillance and Search (MANTISS), 2015 *NRL Review*, 2016.

Downwash Detection and Avoidance with Small Quadrotor Helicopters, *Journal of Guidance, Control, and Dynamics*, AIAA, 2016.

Guest Editorial: Special Issue on Networked Cooperative Autonomous Systems, *IEEE Transactions on Automation Science and Engineering* (T-ASE), Vol. 12, Issue 3, IEEE, July 2015.

Bistability, Nash Equilibria, Relatively Dark Collectives, and Social Physics: Modeling the Social Behavior of Teams, *Journal of Enterprise Information*, Volume 5, Issue 4, pp. 241-274, Taylor and Francis, 2015.

Physics-Inspired Motion Planning for Information-Theoretic Target Detection using Multiple Aerial Robots, *Autonomous Robots Journal*, Springer, 2015.

Reactive Motion Planning for Unmanned Aerial Surveillance of Risk-Sensitive Areas, *IEEE Transactions on Automation Science and Engineering*, 12.3 (2015): 783-785.

AAAI Spring 2014 Symposium: The Intersection of Robust Intelligence and Trust in Autonomous Systems, AAAI SSS 2014 Workshop Summary, *AI Magazine*, AAAI, 2014.

Robust Intelligence (RI) under uncertainty: Mathematical foundations of autonomous hybrid (human-machine-robot) teams, organizations and systems. *Structure and Dynamics: eJournal of Anthropological and Related Sciences*, 2013.

AAAI Spring 2012 Symposium: AI, The Fundamental Social Aggregation Challenge, and the Autonomy of Hybrid Agent Groups, *AI Magazine*, 2012.

Distributed Mobile Sensor Networks for Hazardous Applications, Editorial for *International Journal of Distributed Sensor Networks,* Volume 2012, Article ID 970831, Hindawi Publishing Corporation, doi:10.1155/2012/970831, 2012.

AAAI Fall 2010 Symposium on Quantum Informatics, Reports of the AAAI 2010 Fall Symposia, *AI Magazine*, 32(1):93-100, ISSN 0738-4602, AAAI, Spring 2011.

Conservation of Information (COI): Reverse Engineering Dark Social Systems (DSS), *Structure and Dynamics: eJournal of Anthropological and Related Sciences*, University of California eScholarship Repository, 2011.

Memory Based In-Situ Learning for Robots, Invited Article, *IEEE Computer, Special Issue on Unmanned, Intelligent and Autonomous Vehicles*, pp. 62-66, IEEE, Dec. 2006.

Collaborating with Humanoid Robots in Space, *International Journal of Humanoid Robotics*, Volume 2, Number 2, World Scientific Publishing, pp. 181-201, June 2005.

NSF Workshop on Aerospace Applications of Neurocontrol, *IEEE Control Systems Magazine*, April 1991.

Refereed Conference Proceedings Papers

Set-Membership Methods using Coarse Underwater State Estimation, In Proceedings of the 58th Conference on Decision and Control (CDC 2019), IEEE, 2019. *In preparation*

Multi-agent Time-based Path Planning Using A* Implementation on Lighter-than-air Autonomous Agents, In *Proceedings of the 16th IEEE International Conference on Ubiquitous Robots (UR 2019)*, IEEE, 2019. *Under review*

A Local Positioning System for Homogeneous and Teterogeneous Robot-Robot Teams, Robot-Human Teams, and Swarms, In *Proceedings of the 16th IEEE International Conference on Ubiquitous Robots (UR 2019)*, IEEE, 2019. *Under review*

An Urgency-Dependent Quorum Sensing Algorithm for N-Site Selection in Autonomous Swarms, In *Proceedings of the International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2019)*, IFAAMAS, May 2019. *Accepted*

Shibboleth-based Trust Enhancement Between Humans and Humanoid Robots Using Gesture and Contact Focused Dialog, In *Proceedings of the IEEE-RSJ International Conference on Intelligence Robots and Systems (IROS 2018), Workshop on Autonomous Dialogue Technologies in Symbiotic Human-Robot Interaction, IEEE, 2018.*

Path Planning for Information Gathering with Lethal Hazards and No Communication, In *Proceedings of the Workshop on Algorithmic Foundations of Robotics (WAFR 2018)*, Springer Proceedings in Robotics, 2018.

Extending the Life of Legacy Robots via MDS-Ach: A Real-Time, Process Based, Networked, Secure Middleware based on the x-Ach Methodology, In *Proceedings of the 15th Int'l Workshop on Advanced Motion Control (AMC2018)*, IEEE, 2018.

On Humanoid Co-Robot Locomotion when Mechanically Coupled to a Human Partner, In *Proceedings of the 15th International Conference on Ubiquitous Robots (UR 2018)*, IEEE.

Optimization for Autonomous Vehicles with Limited Control Authority, In *Proceedings of International Conference on Intelligent Robots (IROS 2018)*, IEEE, 2018.

Terrain Classification for Autonomous Vehicles Using Bat-Inspired Echolocation, In *Proceedings of the International Joint Conference on Neural Networks (IJCNN 2018)*, IEEE, 2018.

Multi-Robot Task Allocation with Auctions in Harsh Communication Environments, In *Proceedings of the International Symposium on Multi-Robot and Multi-Agent Systems (MRS2017)*, IEEE, 2017.

Wearable Interactive Display for the Local Positioning System (LPS), In *19th ACM International Conference on Multimodal Interaction (ICMI 2017) Demonstration Session*, ACM, 2017.

Novel Physicomimetic Bio-inspired Algorithm for Search and Rescue Applications, In *Proceedings 2017 IEEE Symposium Series on Computational Intelligence (IEEE SSCI 2017)*, IEEE, 2017.

A Comparison of Auction-Based Methods for Search and Rescue in Communication Limited Environments, In *Proceedings of the International Symposium on Multi-Robot and Multi-Agent Systems (MRS2017)*, IEEE, 2017.

Autonomous UAV Search Planning with Possibilistic Inputs. In *Proceedings of SPIE Defense + Commercial Sensing, Society of Photo-Optical Instrumentation Engineers (SPIE)*, 2017.

Maximizing Mutual Information for Multipass Target Search in Changing Environments, In *Proceedings of International Conference on Robotics and Automation (ICRA2017)*, IEEE, 2017.

(Computational) Context. Why It's Important, What It Means, and Can It Be Computed?, *AAAI Spring Symposium*, AAAI, 2017.

Competitive Two Team Target Search Game with Communication Jamming, *Workshop on Algorithmic Foundations of Robotics* (WAFR 2016), Dec. 2016.

Carbon monoxide plume detection with nanowire-based sensors mounted on an unmanned ground vehicle. In *Proceedings of the International Meeting for Chemical Sensors*, 2016.

Comparative Measures of Aggregated Uncertainty for IST Mission Support, *Proceedings of the IST/SET-126 Symposium on Information Fusion (Hard and Soft) for Intelligence, Surveillance & Reconnaissance (ISR)*, NATO IST/SET-126 Panel, May 2015.

AI and the Mitigation of Human Error: A Thermodynamics of Teams, *AAAI Spring Symposium*, AAAI, 2016.

Distributed Information-Theoretic Target Detection Using Physics-Inspired Motion Coordination, In *Proceedings of the 8th International Symposium on Resilient Control Systems*, IEEE, 2015.

Onboard Flow Sensing for Downwash Detection and Avoidance on Small Quadrotor Helicopters, *AIAA SciTech 2015*, AIAA, 2015.

Stabilizing Task-based Omnidirectional Quadruped Locomotion with Virtual Model Control, In *Proceedings IEEE Conference on Robotics and Automation 2015* (ICRA2015), IEEE, 2015.

Fusing Laser Reflectance and Image Data for Terrain Classification for Small Autonomous Robots, In *Proceedings of the 13th International Conference on Control, Automation, Robotics and Vision* (ICARCV 2014), IEEE, 2014.

Application of Grazing-Inspired Guidance Laws to Autonomous Information Gathering, *2014 IEEE/RSJ International Conference on Intelligent Robots and Systems* (IROS), IEEE, 2014.

A Thermodynamics of Teams, Towards a Robust Computational Model of Autonomous Teams, *AAAI Spring Symposium*, 2015.

Physics-Aware Informative Coverage Planning for Autonomous Vehicles, *2014 IEEE International Conference on Robotics and Automation* (ICRA), IEEE, 2014.

Recognition of Seafloor Features by Decision Tree Algorithms in Scenes of Gridded Sonar Data, *2014 Fall Meeting of the American Geophysical Union (AGU) Abstracts*, American Geophysical Union, 2014.

The Intersection of Robust Intelligence and Trust: Hybrid Teams, Firms, and Systems, *AAAI Spring Symposia Series Symposium: The Intersection of Robust Intelligence and Trust in Autonomous Systems*, AAAI, 2014.

Physics-Inspired Robotic Motion Planning for Cooperative Bayesian Target Detection, *Robotic Science and Systems Workshop: Distributed Control and Estimation for Robotic Vehicle Networks*, Springer, 2014.

Central Pattern Generator Based Omnidirectional Locomotion for Quadrupedal Robotics, *Workshop on Real-time Motion Generation & Control*, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), IEEE, 2014.

A Planner for Autonomous Risk-Sensitive Coverage (PARCov) by a Team of Unmanned Aerial Vehicles, *2014 IEEE Symposium Series on Computational Intelligence, Symposium on Swarm Intelligence*, IEEE, 2014.

Trust and Interdependence in Controlling Multi-Agent Multi-Tasking Autonomous Teams. In *2013 AAAI Spring Symposium Series*, 2013.

Social-Psychological Harmonic Oscillators in the Self-Regulation of Organizations and Systems: The Social Physics of Nash Equilibria, *QI-2012*, June 2012.

Conservation of Information for Intelligent Systems: A New Approach to Systems of Human-Machine-Robotic Agents Operating Under Uncertainty, *Advances in Quantum Theory,* Linnaeus University, Sweden: American Institute of Physics (AIP), 2011.

Quorum Sensing for Collective Action and Decision-Making in Mobile Autonomous Teams, *ICAART 2011 — Third International Conference on Agents and Artificial Intelligence*, INSTICC Press, 2011.

Past Point Models: Physicomimetics on Nonholonomic Vehicles, *InfoTech@Aerospace 2011*, March 2011.

The Mathematics of Aggregation, Interdependence, Organizations and Systems of Nash Equilibria (NE): A Replacement for Game Theory, *The Computational Social Science Society of America (CSSSA)*, 2011.

Tactile Sensor System Processing Based On K-means Clustering, *The Tenth International Conference on Machine Learning and Applications* (ICMLA'11), 2011.

An ab initio solution of interdependence: Social organization with first principles, *Advances in Quantum Theory*, Linnaeus University, Sweden: American Institute of Physics (AIP), 2010.

Organizational conservation of information: A work-in-progress of military Medical Department Research Centers (MDRC). *CENTERIS 2010*, Springer, 2010.

Long-Range Near-Optimal Path Planning for Gliders in Complex High-Energy Environments, *2010 IEEE/OES Autonomous Underwater Vehicles (AUV)*, vol., no., pp.1, doi: 10.1109/AUV.2010.5779640, 1-3 Sept. 2010.

Autonomous Route Planning and Navigation for UxV Teams, *ONRG Workshop on Machine Intelligence for Autonomous Operations*, ONRG, October 2009.

Prospective Algorithms for Quantum Evolutionary Computation, In *Quantum Interaction, Proceedings of the Second Quantum Interaction Symposium (QI-2008)*, pp. 98-105, College Publications, UK, 2008.

A Survey of Quantum Programming Languages: History, Methods, and Tools, In *Proceedings of the Second International Conference on Quantum, Nano, and Micro Technologies (ICQNM 2008)*, pp. 66-71, IEEE Computer Society, 2008.

A Generalized Graph-Based Method for Engineering Swarm Solutions to Multiagent Problems, In *Proceedings Parallel Problem Solving from Nature (PPSN IX),* September 2006.

Toward a Framework for Quantum Evolutionary Computation, In *Proceedings of the 2nd IEEE International Conference on Cybernetics and Intelligent Systems (CIS2006)*, pp. 678-682, IEEE Press, June 2006.

Effects of Experience Bias When Seeding With Prior Results, In *Proceedings of the 2005 IEEE Congress on Evolutionary Computation (CEC2005),* IEEE Press, Edinburgh, UK, September 2005.

Toward Multimodal Human-Robot Cooperation and Collaboration, with D. Perzanowski et al., In *Proceedings of the American Institute of Aeronautics and Astronautics First Intelligent System Technical Conference,* Chicago, IL, September 2004.

Cognitive Tools for Humanoid Robots in Space, In *Proceedings of the 16th IFAC Symposium on Automatic Control in Aerospace*, Elsevier Science Ltd, Oxford, UK, June 2004.

Collaborating with a Dynamically Autonomous Cognitive Robot, In *Proceedings of 1st IFAC Symposium on Telematics Applications in Automation and Robotics*, June 2004.

Human-Robot Collaboration and Cognition with an Autonomous Mobile Robot, In *Proceedings of the 8th Conference on Intelligent Autonomous Systems (IAS-8)*, pp. 80-87, IOS Press, March 2004.

Achieving Collaborative Interaction with a Humanoid Robot, In *Proceedings of the Second International Conference on Computational Intelligence, Robotics, and Autonomous Systems*, Singapore, December 2003.

Challenges and Opportunities of Evolutionary Robotics, In *Proceedings of the Second International Conference on Computational Intelligence, Robotics, and Autonomous Systems*, Singapore, December 2003.

Agent-based Multimodal Interface for Dynamically Autonomous Mobile Robots, In *Proceedings of the 11th International Conference on Advanced Robotics (ICAR2003)*, Volume 1, pp. 429-434, ICAR 2003, June 2003.

Evolutionary Robotics: From Behaviorism to Embodied Cognition, In *Proceedings of the International Conference on Computer, Communications and Control Technologies (CCCT'03)*, pp. 496-502, International Institute of Informatics and Systemics, July 2003.

Evolutionary Computational Approaches to Solving the Multiple Traveling Salesman Problem using a Neighborhood Attractor Schema, In *Proceedings of the 2nd European Workshop on Evolutionary Computation in Combinatorial Optimization*, EvoWorkshops LNCS Series, Springer-Verlag, 2002.

A Blended Population Approach to Cooperative Coevolution for Decomposition of Complex Problems, In *Proceedings of the 2002 Congress on Evolutionary Computation (CEC2002)*, IEEE, 2002.

Using Genetic Algorithm Based Variable Selection to Improve Neural Network Models for Real-World Systems, In *Proceedings 2002 International Conference on Machine Learning and Applications (ICMLA'02),* CSREA Press, 2002.

Design and Implementation of a Multi-Use Robotic Manipulator System to Improve Shipyard Manufacturing Processes, *Society of Naval Architects and Marine Engineers (SNAME) 2001 Ship production Symposium,* June 2001.

Recent Advances in Active Damage Interrogation, *Proceedings 42nd AIAA Structures, Structural Dynamics, and Materials Conference*, April 2001.

Design, Implementation, and Cooperative Co-evolution of an Autonomous/Teleoperated Control System for a Serpentine Automated Waste Retrieval Manipulator, *American Nuclear Society 9th International Topical Meeting on Robotics and Remote Systems*, March 2001.

Improved Neural Modeling of Real-World Systems Using Genetic Algorithm Based Variable Selection, *International Conference on Neural Networks and Brain (ICNN&B'98-Beijing)*, Beijing China, October 1998.

Local Area Damage Detection in Composite Structures Using Piezoelectric Transducers, *Proceedings SPIE Symposium on Smart Structures and Materials*, Vol. 3326, 1998.

Virtual Sensor Based Fault Detection and Classification on a Plasma Etch Reactor, *The Second Joint Mexico-US International Workshop on Neural Networks and Neurocontrol*, Playa del Carmen, Quintana Roo Mexico, Aug. 1997.

Structural Health Monitoring Using Neural Network Based Vibrational System Identification, *Proceedings Australia-New Zealand Conference on Intelligent Information Systems*, 1994.

Differentiable CMAC models for on-line learning control, *Proceedings NASA-AIND Workshop on Neural Networks*, Auburn, AL, Feb. 1992.

Neural network based process control, In *Proceedings 29th IEEE Conference on Decision and Control*, Honolulu, HI, December 1990.

Abstracts, Posters, and Tech Notes

Reproducible Experimental Results of Swarming Behavior Using Mixed Reality, *ICRA 2019 Workshop on 'Taking Reproducible Research in Robotics to the Mainstream'*, IEEE, 2019. (accepted)

Multimodal Control of Lighter-Than-Air Agents, Extended Abstract for *20th ACM International Conference on Multimodal Interaction (ICMI 2018) Demonstration Session*, ACM, 2018.

Reducing Cross Entropy to Not Cross Paths: Improving Multiagent Coordination, Poster for *Entropy 2018: From Physics to Information Sciences and Geometry*, 2018.

Persistent Monitoring for Autonomous Surface Vessel Teams, NRL 5510 Technical Note, NRL Code 5510, 2018.

Experimental Setup and Approach for Co-Robot Locomotion when Mechanically Coupled to a Human Partner, In *IEEE RAS International Conference on Humanoid Robots (IEEE Humanoids 2017),* IEEE, 2017.

BAT SAVVi: Bio-inspired Adapted Techniques for Sensing, Actuation and Vocalization using Vibro-acoustics, UK/US Stocktake Meeting, 2018.

Distributed Relative Localization Using Ultra-Wideband Ranging, In *Proceedings of the 2017 International Conference on Intelligent Robots and Systems (IROS2017)*, IEEE, 2017.

The Performance of Auctions for Multi-Robot Task Allocation in Harsh Communication Environments, Poster for *Robotics: Science and Systems, Workshop on Robot Communication in the Wild (RSS-2017 RCW)*, 2017.

Central Pattern Generator-Based Omnidirectional Locomotion for Quadrupedal Robotics," Poster for *Smithsonian National Air and Space Museum Robotics Week*, Smithsonian Air & Space Museum, April 3, 2015.

Coordination Design, Poster for *2015 Robotics: Science and Systems (RSS-2015) Principles of Multi-Robot Systems Workshop*, Robotics: Science and Systems Foundation, 2015.

Mobile Autonomous Navy Teams for Information Surveillance and Search (MANTISS), Poster for *Workshop on Crossing the Reality Gap: Control, Human Interaction and Cloud Technology for Multi- and Many-Robot Systems, 2014 IEEE International Conference on Robotics and Automation* (ICRA), IEEE, 2014.

Central Pattern Generator Based Omnidirectional Locomotion for Quadrupedal Robotics, Poster for *Workshop on Real-time Motion Generation & Control*, *IEEE/RSJ International Conference on Intelligent Robots and Systems* (IROS), IEEE, 2014.

Central Pattern Generator Based Gait Control for a Quadruped Robot, Poster, *Third Annual Karles Invitational Conference on Intelligent and Autonomous Systems Science and Technology*, Naval Research Laboratory (NRL), Jan. 13-14, 2014.

Chemical Plume Detection with SiN-VAPOR Sensor, Poster, *Third Annual Karles Invitational Conference on Intelligent and Autonomous Systems Science and Technology*, Naval Research Laboratory (NRL), Jan. 13-14, 2014.

Spectral Reflectance for Terrain Classification and Detecting Objects in Cluttered Environments, Poster, *Third Annual Karles Invitational Conference on Intelligent and Autonomous Systems Science and Technology*, Naval Research Laboratory (NRL), Jan. 13-14, 2014.

Physics-inspired Motion Planning for Bayesian Target Detection with Quadrotors, Poster, *Third Annual Karles Invitational Conference on Intelligent and Autonomous Systems Science and Technology*, Naval Research Laboratory (NRL), Jan. 13-14, 2014.

Addressing Mobility and Localization Constraints in Physicomimetics, Poster presentation at *ICRA2012 Workshop "Many-Robot Systems: Crossing the Reality Gap"*, 14 May 2012.

The physics of bistability in the organization and system control with an ab initio mathematical solution, poster for *Decade of the Mind VI* (DOM-VI), 2010.

Patent

U.S. Patent #5864773, *Virtual sensor based monitoring and fault detection/classification system and method for semiconductor processing equipment*, G. Barna, S. Butler, D. Sofge, and D. White, application filed Nov. 1, 1996, granted Jan. 26, 1999.