

Donald Arthur Sofge

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Research and Professional Experience

Don Sofge is a Computer Scientist and Robotician at the Naval Research Laboratory (NRL) with 32 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 over 160 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 where he developed and teaches the graduate-level course *Robot Learning* for the MAGE Master of Engineering program in Robotics, and helped develop (and co-teaches) *Autonomous Systems Engineering* through the Systems Engineering department.

Work Experience

Teaching:

- 09/20-Present Lecturer, Department of Systems Engineering, University of Maryland
 - Co-developer/instructor for Autonomous Systems Engineering (ENSE698A)
- 01/20-05/20 Adjunct Faculty, Maryland Applied Graduate Engineering (MAGE), University of Maryland, Robotics Program
 - Taught Robot Learning (ENPM690)
- 01/16-12/19 Adjunct Faculty, Office of Advanced Engineering Education (OAE), University of Maryland, Robotics Program
 - Developed and Taught Robot Learning (ENPM808F)

Research:

- 07/01-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
- Swarm Intelligence
- Bio-inspired Models for Control and Actuation of Robotic Systems
- Verification of Autonomous Systems
- Machine Learning for Autonomy

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, Cognitive Computation, and Quantum Information Science
- Member of the Editorial Boards of the *Journal on Advances in Intelligent Systems*, *Robotics*, 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

1988 Master of Science in Electrical Engineering (MSEE) (Sub-area: Computer Engineering), University of Florida

1986 Bachelor of Science in Mathematical Science (Computer Science), University of North Florida

Honors and Awards

- A7. Best Application Paper, “Multiagent Time-Based Path Planning Using A* Implementation on Lighter-Than-Air Autonomous Agents,” *9th IEEE Int’l Conference on Cybernetics and Intelligent Systems, Robotics, Automation and Mechatronics (CIS-RAM)*, 2019.
- A6. Alan Berman Research Publication Award (2018), “Decision Forests for Machine Learning Classification of Large Noisy Seafloor Feature Sets,” *Computers and Geosciences*, 2017.
- A5. DoN/NRL Special-Act Award, In Recognition of Exceptional Performance, 2007.
- A4. Navy Meritorious Unit Commendation Award, 2007.
- A3. NRL Contribution Awards: 01/2003, 09/2003, 01/2005, 09/2006, 01/2008
- A2. Best Paper Award, “Evolutionary Robotics: From Behaviorism to Embodied Cognition,” *International Conference on Computer, Communications and Control Technologies*, 2003.
- A1. Teammate of Distinction Award, McDonnell Douglas Corporation, 1991.

Funded Research Grants and Projects

- P48. Experimentally Verified Autonomous Path Planning for Information Gathering In Lethally Hostile Environments with Severely Limited Communication (EVAPP), ONR, 2020-2022, Principal Investigator
- P47. Rapidly Constructible LTA3 Platforms, ONR, 2020-2021, Principal Investigator
- P46. Bio-Inspired Adapted Techniques for Sensing, Actuation and Vocalization using Vibro-acoustics (BAT SAVVi), NRL NISE/219, 2019-2021, Co-PI
- P45. Game Theory Framework for AUV Decision-Making in Contested Theatres, NRL Base, 2019-2021, Co-PI
- P44. Mixed Reality Experimental Pattern Formation of Communicating Unmanned Aerial Vehicles, ONR, 2018-2020, Co-PI
- P43. Adaptive Real-Time Algorithms for Multiagent Cooperation in Adversarial Environments (ARTAMAC), NRL, 2018-2020, Principal Investigator
- P42. Coherence and Decoherence of Patterns in Swarms with Potential Collisions, ONR, 2018-2019, Principal Investigator
- P41. Squad With Autonomous Teammates Challenge (SWAT-C), US Naval Academy, 2018-2020, Principal Investigator
- P40. Float Navigation and Command & Control (Floats), NRL, 2016-2018, Co-PI
- P39. Autonomous Multi-Agent Search and Rescue in Unpredictable Contested Environments (AMASR), ONR, 2016-2017, Principal Investigator
- P38. Intelligent Micro Unmanned Aerial Vehicle (Intelligent MicroFlyer), NRL, 2016-2017, Co-PI
- P37. Stochastic Prediction and Control of Patterns in Delay Coupled Systems, NRL, 2014-2016, Co-PI
- P36. Autonomous Systems Integration, OSD, 2015-2016
- P35. Mobile Autonomous Navy Teams for Information Search and Surveillance (MANTISS), ONR, 2014-2016, Principal Investigator
- P34. Mesoscale Robotic Locomotion Initiative (MeRLIn-2), NRL, 2014-2016
- P33. Foundations for Complex Geospatial Uncertainty, NRL, 2013-2015, Co-PI
- P32. Irregular Multiresolution Database Algorithm (Bathy), NRL, 2012-2014, Co-PI
- P31. Information Theoretic Analysis of Distributed Sensor Networks, NRL, 2012-2014, Co-PI
- P30. Meso-scale Robotic Locomotion Investigation (MERLIN), 2013-2014, Co-PI
- P29. Designing Cooperating Mobile Agents, ONR, 2012-2014, Principal Investigator
- P28. ARPI Autonomy for Adaptive Collaborative Systems (AACS), OSD
- P27. Phoenix, DARPA
- P26. Robotic Touch Sensing, Manipulation, and Fault Detection, NRL, 2010-2012, Co-PI
- P25. Human Directed Sensor Swarms for Enhanced Situational Awareness, NRL, 2008-2011, Co-PI
- P24. Air to Sea to Space Electronic Tactical Buoy study (ASSET-B), NRL, 2012, Co-PI
- P23. Quorum Sensing in Collaborative Mobile Sensor Swarms, ONR, 2011, Principal Investigator
- P22. Information Theoretic Analysis of Distributed Sensor Networks, NRL, 2009-2011, Co-PI
- P21. Assessing UUV deployment strategies with observation system simulation experiments (aka Glider Observation Strategies, or GOST), NRL, 2008-2010, Co-PI
- P20. Low-Design Impact Inspection Vehicle (LIIVe), NRL, 2008-2010, Co-PI
- P19. Heterogeneous Perceptual Sensor Swarms for Landmine Detection, ONR, 2010, Co-PI
- P18. Quantum Search, NRL, 2008, PI
- P17. Development of Cost Functionals for Real-Time Near-Optimal Trajectory Planning in Rapidly Changing Environments, NRL, 2006, Co-PI
- P16. Coordinated Teams of Autonomous Systems, NRL, 2002-2006

- P15. Multi-Use Manufacturing Manipulator System (MUMMS) Based on the EMMA Robotic Arm, Navy Phase II SBIR, 2000-2001, Principal Investigator
- P14. A New Approach to Local Area Damage Detection in Composite Structures, NSF Phase II SBIR, 1998-2000, Principal Investigator
- P13. A New Approach to Local Area Damage Detection in Composite Structures, NSF Phase I SBIR, 1997, Principal Investigator
- P12. A Neural Network Approach for Active Noise Control in a Three-Dimensional Enclosure, NSF Phase I SBIR, 1997, Principal Investigator
- P11. Fault Detection and Classification & Advanced Process Control for Semiconductor Plasma Etching, Texas Instruments, 1994-1996, Principal Investigator
- P10. Advanced Adaptive Critic Designs for Optimization and Control of Complex Nonlinear Dynamic Systems, NSF, 1996, Principal Investigator
- P9. Identification and Energy Management for Next Generation Vehicles, NSF, 1995, Principal Investigator
- P8. Nonlinear System Identification for Real-Time Structural Health Monitoring in Composite Materials, NSF, 1994, Principal Investigator
- P7. Intelligent Adaptive Structural Integrity Assessment System, NASA, 1994, Principal Investigator
- P6. Reducing Pollution and Increasing Fuel Economy Using Intelligent Control, NSF, 1993-1996, Principal Investigator
- P5. Adaptive Diagnostics and Control of the Plasma Etching Process, ARPA, 1993, Principal Investigator
- P4. Artificial Neural Network based Spectral Interpretation for Transient Infrared Spectroscopy (ANN-SI-TIRS), subcontract to Foster-Miller, ARPA, 1993, Principal Investigator.
- P3. An Intelligent Scalable Control Architecture for Distributed Nonlinear Systems, ARPA, 1993, Principal Investigator
- P2. Learning Optimal Control System for Fiber Placement Processing, ARPA, 1992, Principal Investigator
- P1. Intelligent Design and Manufacture of Thermoplastic Composites, McDonnell Douglas Aerospace, 1991, Principal Investigator

Publications

Edited Books

- B10. Verification of Autonomous Systems. Signe Redfield, Donald Sofge, John Sustersic, and Mae Seto (Editors). Springer Nature Switzerland AG, expected early 2021. (*in development*)
- B9. Systems Engineering and Artificial Intelligence. William F. Lawless, Ranjeev Mittu, Donald A. Sofge, Thomas Shortell, and Tom McDermott (Editors). Springer Nature Switzerland AG, expected early 2021. (*in development*)
- B8. Human-Machine Shared Contexts. William F. Lawless, Ranjeev Mittu, and Donald A. Sofge (Editors), Elsevier Inc., 2020.
- B7. Artificial Intelligence for the Internet of Everything, 1st Edition. William F. Lawless, Ranjeev Mittu, Donald A. Sofge, Ira SS Moskowitz, and Stephen Russell (Editors), Academic Press (an imprint of Elsevier), 2019.
- B6. Computational Context: The Value, Theory and Application of Context with AI. William F. Lawless, Ranjeev Mittu, and Donald A. Sofge (Editors), CRC Press (a division of Taylor & Francis), 2018.
- B5. Autonomy and Artificial Intelligence: A Threat or Savior? William F. Lawless, Ranjeev Mittu, Donald A. Sofge, and Stephen Russell (Editors), Springer International Publishing AG, 2017.

- B4. Robust Intelligence and Trust in Autonomous Systems. Ranjeev Mittu, Donald A. Sofge, Alan Wagner, and William F. Lawless (Editors), Springer International Publishing AG, 2016.
- B3. Quantum Interaction, Proceedings of the Third Quantum Interaction Symposium (QI-2009). Peter Bruza, Donald Sofge, William F. Lawless, Keith van Rijsbergen, and Matthias Klusch (Editors), LNAI5494, Springer, 2009.
- B2. Quantum Interaction, Proceedings of the Second Quantum Interaction Symposium (QI-2008). Peter Bruza, William F. Lawless, Keith van Rijsbergen, Donald A. Sofge, and Bob Coecke (Editors), College Publications, UK, 2008.
- B1. Handbook of Intelligent Control: Neural, Fuzzy, and Adaptive Approaches. David A. White and Donald A. Sofge (Editors), Van Nostrand Reinhold, 1992.

Edited Journal Special Issues

- EJ5. Autonomous Robots, Special Issue on Robot Communication Challenges: Real-world Problems, Systems, and Methods. Michael Otte, Don Sofge, and Robert Fitch (Editors), Volume 44, No 1, Springer, January 2020.
- EJ4. AI Magazine, Successful Research in AI. William F. Lawless, Ranjeev Mittu, Don Sofge, and Laura Hiatt, Guest Editors for the Special Section on Articles on Context II, Volume 40, Number 4, AAAI, Winter 2019.
- EJ3. AI Magazine AI and Context. William F. Lawless, Ranjeev Mittu, Don Sofge, and Laura Hiatt, Guest Editors for Special Section on Articles on Context, Volume 40, Number 3, AAAI, Fall 2019.
- EJ2. Networked Cooperative Autonomous Systems. Lorenzo Sabattini, Frank Ehlers, and Don Sofge (Editors), *IEEE Transactions on Automation Science and Engineering*, Volume 12, Number 3, ISSN 1545-5955, IEEE, July 2015.
- EJ1. Distributed Mobile Sensor Networks for Hazardous Applications. Frank Ehlers, Don Sofge, Mandar Chitre, and John Potter (Editors), *International Journal of Distributed Sensor Networks*, Sage Publishing, 2012.

Book Chapters

- BC20. Cyber-(in)security, revisited: Proactive cyber-defenses, interdependence and autonomous human-machine teams (A-HMTs). William F. Lawless, Ranjeev Mittu, Ira S. Moskowitz, Donald Sofge, and Stephen Russell. In *Adversary-Aware Learning Techniques and Trends in Cybersecurity*, Springer Nature Switzerland AG, 2020.
- BC19. Preface — Human-Machine Shared Contexts. William F. Lawless, Ranjeev Mittu, and Donald A. Sofge. *Human-Machine Shared Contexts*, Elsevier, 2020.
- BC18. Introduction — Human-Machine Shared Contexts. William F. Lawless, Ranjeev Mittu, and Donald A. Sofge. *Human-Machine Shared Contexts*, Elsevier, 2020.
- BC17. Preface — Artificial Intelligence for the Internet of Everything. William F. Lawless, Ranjeev Mittu, Donald A. Sofge, Ira S. Moskowitz, and Stephen Russell. *Artificial Intelligence for the Internet of Everything*, 1st Edition, Academic Press (an imprint of Elsevier), 2019.
- BC16. Introduction — Artificial Intelligence for the Internet of Everything. William F. Lawless, Ranjeev Mittu, Donald A. Sofge, Ira S. Moskowitz, and Stephen Russell. *Artificial Intelligence for the Internet of Everything*, 1st Edition, Academic Press (an imprint of Elsevier), 2019.
- BC15. Preface — Computational Context: The Value, Theory and Application of Context with AI. William F. Lawless, Ranjeev Mittu, and Donald A. Sofge. *Computational Context: The Value, Theory and Application of Context with AI*, CRC Press, 2018.
- BC14. Introduction — Computational Context: The Value, Theory and Application of Context with AI. William F. Lawless, Ranjeev Mittu, and Donald A. Sofge. *Computational Context: The Value, Theory and Application of Context with AI*, CRC Press, 2018.

- BC13. Cyber-(in)Security, context and theory: Proactive Cyber-Defenses, Computational Context: The Value, Theory and Application of Context with AI. William F. Lawless, Ranjeev Mittu, Ira S. Moskowitz, Donald Sofge, and Stephen Russell. CRC Press, 2018.
- BC12. Preface — Autonomy and Artificial Intelligence: A Threat or Savior? William F. Lawless, Ranjeev Mittu, Donald A. Sofge, and Stephen Russell. *Autonomy and Artificial Intelligence: A Threat or Savior?*, Springer International Publishing AG, 2017.
- BC11. Introduction — Autonomy and Artificial Intelligence: A Threat or Savior? William F. Lawless, Ranjeev Mittu, Donald A. Sofge, and Stephen Russell. *Autonomy and Artificial Intelligence — A Threat or Savior?*, Chapter 1, Springer International Publishing AG, 2017.
- BC10. Evaluations — Autonomy and Artificial Intelligence: A Threat or Savior? William F. Lawless and Donald A. Sofge. *Autonomy and Artificial Intelligence*, Chapter 13, Springer International Publishing AG, 2017.
- BC9. Preface — Robust Intelligence and Trust in Autonomous Systems. Ranjeev Mittu, Donald A. Sofge, Alan Wagner, and William F. Lawless. *Robust Intelligence and Trust in Autonomous Systems*, Springer International Publishing AG, 2016.
- BC8. Introduction — Robust Intelligence and Trust in Autonomous Systems. Ranjeev Mittu, Donald A. Sofge, Alan Wagner, and William F. Lawless. *Robust Intelligence and Trust in Autonomous Systems*, Chapter 1, Springer International Publishing AG, 2016.
- BC7. The Intersection of Robust Intelligence and Trust: Hybrid Teams, Firms, and Systems. William F. Lawless and Donald A. Sofge. *Robust Intelligence and Trust in Autonomous Systems*, Chapter 12, Springer International Publishing AG, 2016.
- BC6. Preface — Quantum Interaction, Proceedings of the Third Quantum Interaction Symposium (QI-2009). Peter Bruza, Donald Sofge, William F. Lawless, Keith van Rijbergen, and Matthias Klusch. *Quantum Interaction, Proceedings of the Third Quantum Interaction Symposium (QI-2009)*, LNAI5494, Springer, 2009.
- BC5. Conservation of Information (COI): Geospatial and Operational Developments in E-Health and Telemedicine for Virtual and Rural Communities. Max E. Stachura, Elena V. Astapova, Hui-Lien Tung, Donald A. Sofge, James Grayson, Margo Bergman, and Joseph Wood. *Handbook of Research on Developments in e-Health and Telemedicine*, IGI Global, 2009.
- BC4. Applying an Organizational Uncertainty Principle: Semantic Web-Based Metrics. Joseph Wood, Hui-Lien Tung, Tina Marshall-Bradley, Donald A. Sofge, James M. Grayson, Margo Bergman, and William F. Lawless. *Handbook of Research on Social Dimensions of Semantic Technologies and Web Services*, IGI Global, 2009.
- BC3. An Approach to Intelligent Identification and Control of Nonlinear Dynamical Systems. Donald A. Sofge and David L. Elliott. *Neural Adaptive Control Technology*, Chapter 9, World Scientific, pp. 265-284, 1996.
- BC2. Applied Learning: Optimal Control for Manufacturing. Donald A. Sofge and David A. White, *Handbook of Intelligent Control: Neural, Fuzzy, and Adaptive Approaches*, Chapter 9, New York: Van Nostrand Reinhold, pp. 259-282, 1992.
- BC1. Neural network based control for composite manufacturing. Donald A. Sofge and David A. White, *Intelligent Processing of Materials*, New York: ASME Publications, 1990.

Journal and Magazine Articles

- J28. Auctions for Multi-Robot Task Allocation in Communication Limited Environments. Michael Otte, Michael J. Kuhlman, and Donald A. Sofge. In *Autonomous Robots (Special Issue on Multi-Robot Systems)*, Volume 44, Issue 3-4, 547–584, Springer, 2020. DOI: <https://doi.org/10.1007/s10514-019-09828-5>

- J27. Swarm and Multi-agent Time-based A* Path Planning for Lighter-Than-Air Systems. Jason Gibson, Tristan Schuler, Loy McGuire, Daniel Lofaro, and Donald Sofge. In *Unmanned Systems Journal* (Special Issue), Worldwide Scientific, 2020.
- J26. Guest editorial. Michael Otte, Don Sofge, and Robert Fitch. Special issue on robot communication challenges: real-world problems, systems, and methods, In *Autonomous Robots (Special issue on robot communication challenges: real-world problems, systems, and methods)*, Volume 44, Issue 1-2, Springer, 2020. DOI: <https://doi.org/10.1007/s10514-019-09898-5>
- J25. Introduction to Articles in the Special Issue: Artificial Intelligence (AI), Autonomy and Human-Machine Teams: Interdependence, Context, and Explainable AI. William F. Lawless, Ranjeev Mittu, Don Sofge, and Laura Hiatt. *AI Magazine Special Issue on Computational Context*, Volume 40 Number 3, AAAI, Fall 2019.
- J24. Reports of the AAAI 2019 Spring Symposium Series. Ioana Baldini, Clark Barrett, Antonio Chella, Carlos Cinelli, David Gamez, Leilani Gilpin, Knut Hinkelmann, Dylan Holmes, Takashi Kido, Murat Kocaoglu, William F. Lawless, Alessio Lomuscio, Jamie C. Macbeth, Andreas Martin, Ranjeev Mittu, Evan Patterson, Donald Sofge, Prasad Tadepalli, Keiki Takadama and Shomir Wilson. *AI Magazine*, 40(3), 59-66. 2019. <https://doi.org/10.1609/aimag.v40i3.5181>
- J23. AI Bookie: Will a Self-Authorizing AI-Based System Take Control from a Human Operator? Donald Sofge, William F. Lawless, and Ranjeev Mittu. *AI Magazine*, 40(3), 79-84, AAAI, Fall 2019. DOI: <https://doi.org/10.1609/aimag.v40i3.5196>
- J22. Artificial Intelligence, Autonomy, and Human-Machine Teams – Interdependence, Context, and Explainable AI. William F. Lawless, Ranjeev Mittu, Don Sofge, and Laura Hiatt. *AI Magazine*, 40(3), 5-13, AAAI, 2019. DOI: <https://doi.org/10.1609/aimag.v40i3.2866>
- J21. Extending the Life of Legacy Robots: MDS-Ach. Daniel M. Lofaro, Magdalena Bugajska, and Donald Sofge. In *Advances in Science, Technology and Engineering Systems Journal*, Vol. 4, No. 1, pp. 50-72, ASTES, 2019.
- J20. Motion Localization with Optic Flow for Autonomous Robot Teams and Swarms. Andrew Massimino and Donald Sofge, *Journal of Computer and Communications*, Vol. 6, pp. 265-274, Scientific Research Publishing, 2018.
- J19. Multipass Target Search in Natural Environments. Michael Kuhlman, Michael Otte, Donald Sofge, and Satyandra K. Gupta. *Sensors*, MDPI (Multidisciplinary Digital Publishing Institute), 2017.
- J18. Competitive Target Search with Multi-Agent Teams: Symmetric and Asymmetric Communication Constraints. Michael Otte, Michael Kuhlman, Donald Sofge. *Autonomous Robots*, Springer, 2017.
- J17. AAAI Spring 2017 Symposium: Computational Context: Why It's Important, What It Means, and Can It Be Computed? William F. Lawless, Ranjeev Mittu, and Donald Sofge. AAAI SSS 2017 Summaries, *AI Magazine*, 2017.
- J16. Decision Forests for Machine Learning Classification of Large, Noisy Seafloor Feature Sets. Ed Lawson, Denson Smith, Donald Sofge, Paul Elmore, and Fred Petry. *Journal of Computers & Geosciences*, Elsevier, 2017.
- J15. Mobile Autonomous Navy Teams for Information Surveillance and Search (MANTISS), Donald Sofge, Michael Kuhlman, Nitin Sydney, Alex Wallar, and Keith Sullivan. 2015 *NRL Review*, 2016.
- J14. Downwash Detection and Avoidance with Small Quadrotor Helicopters. Derrick Yeo, Nitin Sydney, Derek Paley, and Donald Sofge. *Journal of Guidance, Control, and Dynamics*, AIAA, 2016.

- J13. Guest Editorial: Special Issue on Networked Cooperative Autonomous Systems. Lorenzo Sabattini, Frank Ehlers, and Don Sofge. *IEEE Transactions on Automation Science and Engineering* (T-ASE), Vol. 12, Issue 3, IEEE, July 2015.
- J12. Bistability, Nash Equilibria, Relatively Dark Collectives, and Social Physics: Modeling the Social Behavior of Teams. William F. Lawless, Donald A. Sofge, Laurent Chaudron, and Olivier Barthele. *Journal of Enterprise Information*, Volume 5, Issue 4, pp. 241-274, Taylor and Francis, 2015.
- J11. Physics-Inspired Motion Planning for Information-Theoretic Target Detection using Multiple Aerial Robots. Nitin Sydney, Derek A. Paley, and Donald Sofge. *Autonomous Robots Journal*, Springer, 2015.
- J10. Reactive Motion Planning for Unmanned Aerial Surveillance of Risk-Sensitive Areas. Alex Wallar, Erion Plaku, and Donald A. Sofge. *IEEE Transactions on Automation Science and Engineering*, 12.3 (2015): 783-785.
- J9. Robust Intelligence (RI) under uncertainty: Mathematical foundations of autonomous hybrid (human-machine-robot) teams, organizations and systems. William F. Lawless, James Llinas, Ranjeev Mittu, Don Sofge, Ciara Sibley, Joseph Coyne, and Stephen Russell. *Structure and Dynamics: eJournal of Anthropological and Related Sciences*, 2013.
- J8. AAAI Spring 2012 Symposium: AI, The Fundamental Social Aggregation Challenge, and the Autonomy of Hybrid Agent Groups. William F. Lawless, Don Sofge, Mark Klein, and Laurent Chaudron. *AI Magazine*, 33(3), 109. 2012.
<https://doi.org/10.1609/aimag.v33i3.2428>
- J7. Distributed Mobile Sensor Networks for Hazardous Applications, Editorial for *International Journal of Distributed Sensor Networks*, Frank Ehlers, Don Sofge, Mandar Chitre, and John Potter. Volume 2012, Article ID 970831, Hindawi Publishing Corporation, doi:10.1155/2012/970831, 2012.
- J6. AAAI Fall 2010 Symposium on Quantum Informatics, Reports of the AAAI 2010 Fall Symposia. Roger Azevedo, Gautam Biswas, Dan Bohus, Ted Carmichael, Mark Finlayson, Mirsad Hadzikadic, Catherine Havasi, Eric Horvitz, Takayuki Kanda, Oluwasanmi Koyejo, William Lawless, Doug Lenat, Felipe Meneguzzi, Bilge Mutlu, Jean Oh, Roberto Pirrone, Antoine Raux, Donald Sofge, Gita Sukthankar, and Benjamin Van Durme. *AI Magazine*, 32(1):93-100, ISSN 0738-4602, AAAI, Spring 2011.
- J5. Conservation of Information (COI): Reverse Engineering Dark Social Systems (DSS). William F. Lawless, Stan Rifkin, Donald Sofge, Stephen H. Hobbs, Fjorentina Angjellari-Dajci, Laurent Chaudron, and Joseph Wood. *Structure and Dynamics: eJournal of Anthropological and Related Sciences*, University of California eScholarship Repository, 2011.
- J4. Memory Based In-Situ Learning for Robots. Patrick McDowell, Brian S. Bourgeois, Donald A. Sofge, and S. Sitharama Iyengar. Invited Article, *IEEE Computer, Special Issue on Unmanned, Intelligent and Autonomous Vehicles*, pp. 62-66, IEEE, Dec. 2006.
- J3. Collaborating with Humanoid Robots in Space. Donald Sofge, Magdalena Bugajska, J. Gregory Trafton, Dennis Perzanowski, Scott Thomas, Marjorie Skubic, Samuel Blisard, Nicholas Cassimatis, Derek Brock, William Adams, and Alan Schultz. *International Journal of Humanoid Robotics*, Volume 2, Number 2, pp. 181-201, World Scientific Publishing, June 2005.
- J2. Design and implementation of a Multi-Use Manipulator System to improve shipyard Manufacturing processes. Donald Sofge, Lynn Vogel, Yuchi Huang, and John Wentz. *Journal of Ship Production*, 17, no. 3 (2001): 130-134.
- J1. NSF Workshop on Aerospace Applications of Neurocontrol. Donald Sofge and David White. *IEEE Control Systems Magazine*, April 1991, IEEE.

Refereed Conference Proceedings (including Workshop and Symposia) Papers

- C73. Cooperative Emergent Swarming through Deep Reinforcement Learning. Tony X. Lin, Daniel Lofaro, and Donald Sofge. In *Proceedings of the 16th IEEE International Conference on Control & Automation (ICCA 2020)*, IEEE, 2020.
- C72. Case-Based Gesture Interface for Multiagent Formation Control. Divya Srivastava, Daniel Lofaro, Tristan Schuler, Donald Sofge, and David Aha. In *Proceedings of the 28th International Conference on Case-Based Reasoning (2020 ICCBR)*, Springer Nature, 2020.
- C71. Set-Based State Estimation of Mobile Robots from Coarse Range Measurements. Tony X. Lin, Samuel Coogan, Donald Sofge, and Fumin Zhang. In *Proceedings 2020 IEEE Conference on Control Technology and Applications (CCTA)*, IEEE, 2020.
- C70. Persistent Area Coverage for Swarms Utilizing Deployment Entropy with Potential Fields. John D. Kelly, Daniel M. Lofaro, and Donald Sofge. In *Proceedings 17th International Conference on Ubiquitous Robots (UR 2020)*, IEEE, 2020.
- C69. Bio-Inspired Distance Estimation Using the Self-Induced Acoustic Signature of a Motor-Propeller System. Luke Calkins, Joseph Lingeitch, Loy McGuire, Jason Geder, Matthew Kelly, Michael M. Zavlanos, Donald Sofge, and Daniel Lofaro. In *Proceedings of International Conference on Robotics and Automation (ICRA 2020)*, IEEE, 2020.
- C68. Quorum Sensing Re-evaluation Algorithm for N-site Selection in Autonomous Swarms. Shreeya Khurana and Donald Sofge. In *Proceedings 12th International Conference on Agents and Artificial Intelligence (ICAART 2020)*, SCITEPRESS, 2020.
- C67. Pursuit-Evasion with Decentralized Robotic Swarm in Continuous State Space and Action Space via Deep Reinforcement Learning. Gurpreet Singh, Daniel M. Lofaro, and Donald Sofge. In *Proceedings 12th International Conference on Agents and Artificial Intelligence (ICAART 2020)*, SCITEPRESS, 2020.
- C66. Multi-agent Time-based Path Planning Using A* Implementation on Lighter-than-air Autonomous Agents. Jason Gibson, Tristan Schuler, Loy McGuire, Daniel Lofaro, and Donald Sofge. In *Proceedings of the 9th IEEE International Conference on Cybernetics and Intelligent Systems, Robotics, Automation and Mechatronics (CIS-RAM 2019)*, IEEE, 2019. (Received Best Application Paper Award)
- C65. Gesture-Based Interface for Multi-Agent and Swarm Formation Control. Divya Srivastava, Daniel Lofaro, Tristan Schuler, Donald Sofge. In *Proceedings of SWARM 2019: The 3rd International Symposium on Swarm Behavior and Bio-Inspired Robotics*, IEEE, 2019.
- C64. A Study of Robotic Swarms and Emergent Behaviors using 25+ Real-World Lighter-Than-Air Autonomous Agents (LTA3). Tristan Schuler, Daniel M. Lofaro, Loy McGuire, Alexandra Schroer, Tony Lin, and Donald Sofge. In *Proceedings of SWARM 2019: The 3rd International Symposium on Swarm Behavior and Bio-Inspired Robotics*, IEEE, 2019.
- C63. LPS: A Local Positioning System for Homogeneous and Heterogeneous Robot-Robot Teams, Robot-Human Teams, and Swarms. Christopher Taylor, Colin Ward, Donald Sofge, and Daniel M. Lofaro. In *Proceedings of the 16th IEEE International Conference on Ubiquitous Robots (UR 2019)*, IEEE, 2019.
- C62. Optimizing Multiagent Area Coverage Using Dynamic Global Potential Fields. Rahul Rajan, Michael Otte, and Donald Sofge. In *Proceedings of the 2018 IEEE Symposium Series on Computational Intelligence*, IEEE, 2018.
- C61. Path Planning for Information Gathering with Lethal Hazards and No Communication. Michael Otte and Donald Sofge. In *Proceedings of the International Workshop on Algorithmic Foundations of Robotics (WAFR 2018)*, Springer Proc. in Robotics, 2018.
- C60. Extending the Life of Legacy Robots via MDS-Ach: A Real-Time, Process Based, Networked, Secure Middleware based on the x-Ach Methodology. Daniel Lofaro, Magdalena Bugajska, and Donald Sofge. In *Proceedings of the 15th Int'l Workshop on Advanced Motion Control (AMC2018)*, IEEE, 2018.

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