

Alberto Speranzon, Ph.D.

CURRENT CONTACT INFORMATION Honeywell Aerospace
Advanced Technology
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SUMMARY Experienced research scientist (15+ years of experience) working across multiple research areas: autonomous systems, machine learning, applied mathematics and (distributed) computation. Principal investigator and program manager of internally and externally funded projects working with multiple groups and universities. In particular, I have led or co-led projects sponsored by DARPA with University of Pennsylvania, Princeton, CMU and others. My teams tend to comprise of researchers (PhD and MSc) with different backgrounds, ranging from applied mathematics, optimization, navigation, software architecture and verification & validation.

I am particularly skilled at applying novel and out-of-the-box methods to difficult technical problems requiring highly multi-disciplinary approaches and teams. At the same time, I have a strong customer focus that has enabled me to spearhead new technology developments targeting specific customer needs and enabling the companies I work for to pursue new business opportunities.

RESEARCH INTERESTS Fusion of qualitative and quantitative sensor data using statistical and algebraic topological methods; Probabilistic methods for autonomous multi-agent systems with particular focus on planning under uncertainty; Distributed multi-sensor fusion for navigation in GPS denied/degraded environments; Distributed algorithms for control, estimation and optimization; Modeling, analysis and verification of complex systems of systems.

CURRENT POSITION **Honeywell Aerospace - Advanced Technology
Communication, Navigation and Surveillance** *Plymouth, MN, USA*

Technical Fellow **September 2018 – Present**

As a technical fellow I am the technical lead of projects in the area of autonomous system, mostly aerial vehicles, such as Unmanned Aerial Vehicles (UAV) and Urban Aerial Mobility (UAM) and machine learning applied to image processing for such applications.

I am also involved in defining long term roadmaps interacting with other technical staff as well as business leaders.

I am currently co-PI of a DARPA project with the University of Pennsylvania (PI Prof. Robert Ghrist) on novel methods for optimization. I also have an active collaboration with Dr. David Spivak (MIT) on novel methods to model and analyze complex systems of systems.

EDUCATION

Ph.D. in Automatic Control, May 2006

Royal Institute of Technology, Stockholm, Sweden

Dissertation Title:

“Coordination, Consensus and Communication in Multi-Robot Control Systems”

Advisor: Prof. Karl Henrik Johansson

External reviewer:

Prof. George J. Pappas, University of Pennsylvania, Philadelphia, PA, USA.

Review committee:

Prof. Antonio Bicchi, University of Pisa, Italy

Dr. Petter Ögren, Swedish Defence Agency, Sweden

Prof. Erik Aurell, Royal Institute of Technology, Sweden

Licentiate degree, November 2004

Royal Institute of Technology, Stockholm, Sweden

Thesis Title: “On Control under Communication Constraints in Autonomous Multi-robot Systems”

Advisor: Prof. Karl Henrik Johansson

M.S. Computer Engineering, November 2000

University of Padova, Padova, Italy

Thesis Title: “A Feedback Control System for Reversing a Multi-Body Vehicle”

Advisor: Prof. Ruggero Frezza

PROFESSIONAL EXPERIENCE

Honeywell Aerospace – Advanced Technology *Plymouth & Golden Valley, MN, USA*

Staff Research Scientist

September 2015 – August 2018

Staff Research Scientist (equivalent to Principal Research Scientist at United Technologies Research Center) acting as Program Manager and Principal Investigator of an internally sponsored project on autonomous systems with particular focus on Unmanned Aerial Vehicles for infrastructure inspection problems and data analytics/machine learning for such applications. I am responsible for the mid/long term research in autonomy and machine learning and I have been involved in establishing a new business in this area, announced by Honeywell in September 2017.¹

Technical lead for a NASA sponsored project on the development of new mathematical methods for analysis and composition of complex systems of systems. This work is performed in collaboration with MIT and led to a Best Poster Award² at the “Hybrid Systems: Computation and Control (HSCC)”, 2017 (part of the CPSWeek). I also organized two invited sessions at the SIAM Conference on Control and Its Applications, Pittsburgh, 2017, on new mathematical methods for abstraction, composition and verification of systems of systems.

¹See the public announcement <http://www.honeywell.com/newsroom/pressreleases/2017/09/honeywell-launches-uav-industrial-inspection-service-teams-with-intel-on-innovative-offering>

²See <http://hsc2017.ece.illinois.edu/Awards.html>

United Technologies Research Center

East Hartford, CT, USA

Principal Research Scientist

April 2015 – September 2015

Developed new mathematical methods for autonomous systems, privacy in large scale cyber-physical systems and novel methods for analysis of transaction data.

Led/co-led of the following projects:

2015

- Artificial Intelligence and Robotics for Distributed Autonomous Systems. Funding from DARPA Defense Science Office (DSO) on algebraic topological methods for distributed multi-agent systems and new world model abstractions. Team: UTRC & University of Pennsylvania (Prof. Robert Ghrist and Prof. Vijay Kumar) - Principal Investigator and Project Manager.
- Privacy and security for cyber-physical systems, part of the Cyber-Physical Systems Security project, internally funded - co-Principal Investigator.

Staff Research Scientist

November 2010 – March 2015

Working on multi-objective path planning for autonomous vehicles with perception-based constraints; Hierarchical planning for complex missions; GPS denied localization fusing quantitative and qualitative data; Cyber-physical systems privacy and security; Machine learning for big data.

Main internal and external funded projects I led or co-led:

2014

- Ground/air multi-vehicle coordination and planning with human in the loop, part of the Autonomy project, internally funded - co-Principal Investigator and co-Project Manager.
- Trusted service applications, part of the Cyber-Physical Systems Security project, internally funded - Principal Investigator.

2013

- Model-based cyber-physical systems security: Design methods for legacy systems, part of the Cyber-Physical Systems Security project, internally funded - Principal Investigator.
- Path planning under uncertainty and hierarchical planning for complex missions, part of the Autonomy project, internally funded - Principal Investigator and co-Project Manager.

2012

- Robust and adaptive sensor fusion methods for multi-vehicle localization and path planning with intermittent sensing, part of the Autonomy project, internally funded - Principal Investigator.

2011

- Multi-sensor fusion for autonomous vehicles and visual odometry, part of the Autonomy project, internally funded - Principal Investigator - Collaboration with CMU (Dr. Ben Grokholsky).
- DARPA Strategic Technology Office (STO) sponsored project on distributed algorithms for multi-vehicle sensor fusion and localization in GPS denied/degraded environments - \$1.4M - Project Manager and Principal Investigator - Collaboration with UPenn (Prof. Robert Ghrist), Princeton (Prof. Amit Singer), CMU (Prof. Bruno Sinopoli) and UIUC (Prof. Matthew West)

Senior Research Scientist

September 2008 – October 2010

Working on distributed algorithms for localization and tracking of wireless sensors in indoor environments; Sparse representation of videos using reduced order dynamic models; Distributed networked control systems: fundamental limitations.

Main internal and external funded projects I led or co-led:

2010

- Role of social networks in the comfort of buildings, internally funded - Project Manager and Principal Investigator.
- Sensor placement for occupancy estimation in buildings, internally funded - Principal Investigator.

2008-2009

- Fundamental limitation in control over networks, internally funded - Project Manager and Principal Investigator.
- Indoor localization of sensors networks, internally funded - Project Manager and Principal Investigator.

Unilever R&D- Port Sunlight Laboratory

Bebington, UK

Marie Curie Research Fellow

2006 – 2008

Worked on advance robotic applications for health and personal care, research in system biology and modeling of biochemical networks. Continued active research on design and analysis of distributed estimation algorithms over wireless sensor networks with colleagues at Royal Institute of Technology, Sweden and University of California at Berkeley, CA, USA.

Elpro Innotek SpA,

Treviso, Italy

Software Developer

2000 (6 Months)

Developed, with other undergraduate students, a new holonomic mobile robotic platform (GOLEM) for the Robocup (Robot Soccer World Cup), Melbourne, Australia, 2000. Worked on the computer vision algorithms for objects recognition and part of the motion planning algorithms.

ACADEMIC
EXPERIENCE

Royal Institute of Technology

Stockholm, Sweden

Automatic Control Lab, School of Electrical Engineering

2006 (6 Months)

Post-Doctoral Fellow. Working on distributed algorithms for complex networked systems, such as multi-robot and multi-sensor systems. Actively involved in the European Projects IST-RUNES and HYCON.

Automatic Control Lab, School of Electrical Engineering

January 2001 – May 2006

Ph.D. Student. Thesis work on cooperative control under communication constraints for multi-robot systems. Actively involved in the European Project IST-RECSYS.

Master thesis

2000 (5 Months)

Developed master thesis project on the design and implementation of a control algorithm to automatically reverse a truck with two trailers.

University of Padova

Padova, Italy

Visiting Ph.D. Student

2005 (6 Months)

Worked with Prof. Sandro Zampieri at Department of Information Engineering, on problems related to the coordination of a swarm of mobile robots. The emphasis was on how the communication network topology affects the performance (convergence rate to the equilibrium) of such systems.

Research Assistant

1998 – 1999

Research assistant. Worked on the development of two mobile robots, part of the ART-team (Azzurra Robotics Team, an Italian consortium comprising seven different universities) for the Robocup (Robot Soccer World Cup), Stockholm, Sweden, 1999. Developed motion planning and part of the coordination algorithms for the mobile robots. Programming of a low level memory handler for concurrent processes.

PROFESSIONAL
ACTIVITIES

Proposals to USA Government Agencies: Involved in writing proposals to multiple government agencies both the USA and EU. In particular, projects I have been significantly involved are:

- DARPA DSO project within the LAGRANGE program on novel optimization methods using algebraic topology and sheaf theory - Proposal co-author, co-PI with Prof. Robert Ghirst as PI from University of Pennsylvani (2018–Present)
- DARPA DSO seed project on new abstraction methods for pursuit-evasion games - Proposal author, Project Manager and Principal Investigator. (2015)
- DARPA STO project within the ASPN program on GPS denied/degraded navigation - Proposal author, Project Manager and Principal Investigator. (2010–2011)
- DARPA I2O project within the GUARD-DOG program on social network analysis - Proposal co-author, Project Contributor. (2009–2010)

I have also been involved in business development activities to obtain funding from various agencies, mainly DARPA, DOE and IARPA.

Proposals to EU: Key contributor of the proposal to the Irish Government for opening a new research center in Ireland. The research topic of the proposal was “Next Generation

Security Systems". The proposal was very well received by the Irish Government and UTRC awarded me with the Outstanding Achievement Award. The UTRC-Ireland office officially opened in June 2010.

European Projects: Involved in writing parts of the deliverables, review reports and presentations for the following European research projects and network of excellence:

- BRIDGET (MC TOK) MKTD-CD 2005 029961
- RECSYS (IST Project): <http://recsys.s3.kth.se/>
- RUNES (IST Project): <http://www.ist-runes.org/>
- HYCON (Network of excellence): <http://www.ist-hycon.org/>

Technical point of contact for UTRC for the project CANDO (Scalable Cooperative Ad-hoc Networks for Building Monitoring and Diagnostics) submitted to the EU FP7 Programme.

TECHNICAL SESSIONS/WORKSHOPS

- Speaker at
- Organizer of a two parts session titled "Novel Approaches for Modeling, Abstraction, Composition, and Analysis of Systems of Systems (SoS)", at the SIAM Conference on Control and Its Applications, Pittsburgh, 2017. Participants: Dr. D. Spivak (MIT), Prof. R. Ghrist (UPenn), Dr. E. Adam (MIT), Prof. P. Tabuada (UCLA), Prof. A. Ames (CalTech), Dr. A. Censi (MIT/ETHZ), Dr. B. Fong (Oxford/UPenn).
- Co-chair of Invited Session "Security, Privacy and Trust in Cyber-Physical Systems" at the American Control Conference 2015. Participants: Prof. R. Poovendran (UW), J. Hespanha (UCB), G. Pappas (UPenn), Prof. V. Gupta (Notre Dame) and Prof. S. Amin (MIT).
- Chair of the Special Session "Industry Job Hunting" at the American Control Conference 2015. Participants: A. Mirtabatabaei (BOSCH), C. Buhr (MathWorks), A. Raghunathan (MERL), K. C. Fregene (Lockheed).
- Chair of Invited Session "Scalable Methods for Design, Analysis and Control of Networked Systems" at the IEEE Conference on Decision and Control, 2010. Participants: F. Bullo (UCSB), I. Mezić (UCSB), J. Burns (VTech).

PROFESSIONAL SERVICES

Associate Editor of IEEE Transaction on Control Systems Technology, Jan 2015 - Present

Member of the Technical Program Committees:

- Program Committee: ICCPS'18 (International Conference on Cyber-Physical Systems), part of the Cyber-Physical Week 2018 (CPSWeek'18) <http://http://iccps.acm.org/2018test/?q=node/10>
- Co-chair of the session *Robust Autonomy Innovations for Robotic Vehicles*, at the ION GNSS+ 2018. <http://www.ion.org/gnss/sessions.cfm?sessionID=692>
- Program Committee: ICCPS'16 (International Conference on Cyber-Physical Systems), part of the Cyber-Physical Week 2016 (CPSWeek'16) <http://iccps.acm.org/2016/?q=0rganizers>.

- Program Committee: 5th IFAC Workshop on Estimation and Control of Networked Systems (NecSys'15), <http://necsys2015.seas.upenn.edu/index.html>.
- Program Committee: ICCPS'15 (International Conference on Cyber-Physical Systems), part of the Cyber-Physical Week 2015 (CPSWeek'15) <http://iccps.acm.org/2015/indexcc71.html?q=0organizers>.
- Program Committee: RSS'14 Workshop on Distributed Control and Estimation for Robotic Vehicle Networks, <https://sites.google.com/site/rss2014dcworkshop/>.
- Program Committee: 4th IFAC Workshop on Estimation and Control of Networked Systems (NecSys'13), <http://www.necsys2013.ruhr-uni-bochum.de>.
- Program Committee: IEEE SmartGridComm Symposium on Architectures and Models for the Smart Grid, 2012 <http://www.ieee-smartgridcomm.org/1.html>.
- Program Committee: 3rd IFAC Workshop on Estimation and Control of Networked Systems (NecSys'12), <http://necsys2012.engr.ucsb.edu/>.
- Program Committee: 2nd IFAC Workshop on Estimation and Control of Networked Systems (NecSys'10), <http://necsys2010.inrialpes.fr/>.
- Program Committee: 1st IFAC Workshop on Estimation and Control of Networked Systems (NecSys'09), <http://www.necsys.org>.
- Track Co-Chair on Distributed Control Systems of IEEE Conference on Automation Science and Engineering, 2008, Washington D.C., USA, August. 2008.

Proposals Evaluator:

- Evaluator of proposals submitted to the Framework Program 7 (FP7) organized by the European Community. I evaluated projects submitted to the fifth call in Information & Communication Technologies in the area of Networked Embedded and Control Systems: Objective ICT-2009.3.5).
http://cordis.europa.eu/fp7/ict/necs/esmc-home_en.html
- Evaluator of proposals submitted to the Framework Program 7 (FP7) organized by the European Community. I evaluated projects submitted to the second call in Information & Communication Technologies (ICT-2) in the area of Networked Embedded and Control Systems: Objective ICT-2007.3.7.
http://cordis.europa.eu/fp7/ict/necs/esmc-home_en.html

Reviewer:

- Journals: IEEE Transactions on Automatic Control, IEEE Transaction on Signal Processing, IEEE Transactions on Robotics, Automatica, International Journal of Control, ACPA Asian Journal of Control
- Conferences: IEEE International Conference on Robotics and Automation, IEEE Conference on Decision and Control, American Control Conference, IFAC World Congress.

HONORS AND AWARDS

Best Poster & Demo Award at the Hybrid Systems and Control Conference (HSCC), part of the CPS-Week, Pittsburgh, PA, April, 2017.

Outstanding Achievement Award From United Technologies Research Center (UTRC's highest award for recognizing exceptional performance), 2009.

Marie Curie Research Fellowship, Transfer of Knowledge program. The scholarship was granted by the European Community to work at Unilever R&D Port Sunlight, 2007.

Best Session Presentation Award at American Control Conference, Minneapolis, MN, USA, 2006.

Part of the GOLEM Team, ranked second at Robocup'00 (Robot Soccer World Cup), Melbourne, Australia, 2000.

Part of ART-Azzurra Robot Team, ranked second at Robocup'99 (Robot Soccer World Cup), Stockholm, Sweden 1999.

TEACHING & SUPERVISING ACTIVITIES

Honeywell

Golden Valley, MN, USA

Internship Students Supervision

May 2017 – Present

- Karthik Gopalakrishnana, MIT, working on geometric deep learning; (2018)
- Sakthivel Sivaraman, University of Pennsylvania, working on deep neural networks for navigation problems; (2017)

United Technologies Research Center

East Hartford, CT, USA

Internship Students Supervision

June 2013 – August 2015

- Katy Powers, University of Pennsylvania, GRASP Lab, working on visual odometry; (2013)
- Morgan DeHart, American University, Department of Mathematics, working on cyber-physical system security; (2014)
- Peter Niedfeldt, Brigham Young University, Electrical Engineering, working on multi-vehicle SLAM; (2015)
- Rattanachai (Tee) Ramaithitima, University of Pennsylvania, GRASP Lab, working on abstract planning for pursuit-evasion problems. (2015)

Internship Students Supervision

June 2012 – August 2012

Supervised Greg Henselman, Ph.D. student from University of Pennsylvania, Department of Mathematics, working on algebraic topological methods for sensor fusion.

Internship Students Supervision

September 2010 – December 2010

Supervised Sun Yu, Ph.D. student from University of Illinois at Urbana-Champaign, Mechanical Engineering, working on distributed optimization (currently at Siemens Research).

Internship Students Supervision

July 2010

Supervised two Ph.D. students, Chenda Liao from UFL, Mechanical Engineering (currently at Nuance Technologies), and Marcin Szczodrak from Columbia University, Computer Science, working on occupancy estimation in buildings for energy efficient control.

Unilever R&D

Bebington, UK

Internship Students Supervision

July 2007 – September 2007

Supervised two A-level students during an internship at Unilever. The students developed and implemented a leader-follower algorithm using LEGO-Mindstorm.

Royal Institute of Technology

Stockholm, Sweden

Course Assistant

January 2001 – May 2006

Course 2E1700 Electro Project (2001, 2002), 2E1242 Automatic Control Project Course (2002, 2003), 2E1200 Automatic Control (2002, 2003), 2E1262 Nonlinear Systems (2004), 2E1245 Hybrid and Embedded Systems (2004, 2005). The teaching included supervising problem solving sessions and examination. In the control courses it also included laboratory exercises and supervision of course projects. The course 2E1245 Hybrid and Embedded Systems has been developed by Prof. K. H. Johansson and myself and taught for the first time in 2003. In 2004, for the same course, I developed a compendium of exercises with solutions.

Master Student Supervision

January 2002 – May 2006

- Niklas Mattsson, Designing Homework Assignments for Embedded-Control Course, 2006.
- Homan Bromand, Hybrid Control System for Reversing a Multibody Vehicle, 2004.
- Francesco Baldelli, Control and Communication in Multi-Robot Coordination, 2003.
- Rolf Dalenius, Coordinated Control of Mobile Robots, 2002.

**COMPUTER
SKILLS**

Python, TensorFlow, Robotic Operating Systems (ROS), MATLAB, Apache Spark, Hive, SQL, PHP, Java, C/C++
MS Windows, Linux (Ubuntu)
MS Office, \LaTeX
SketchUp, Blender, AutoCad, 3D Studio
Version control software: SVN, Git

INVITED SPEAKER

Speaker at the International Conference on Robotics and Automation (ICRA) at the Workshop on “Topological Methods in Robot Planning” organized by S. Bhattacharya (Lehigh University), F.T. Pokorny (KTH) and V. Kumar (Penn) - May 2019.

“Topological Mapping via Uncooperative Sensing”, Department of Mathematics, MIT, May, 2019.

“Topological Mapping via Uncooperative Sensing”, Georgia Institute of Technology, Oc-

tober, 2018.

IFAC Aerospace Controls Workshop on Networked & Autonomous Air & Space Systems, Invited speaker, "On Abstraction, Composition and Analysis of Complex Systems: Towards V&V of Autonomous Systems" Santa Fe, NM - June 2018.

Applied Category Theory at NIST, Invited Speaker, "Localization and planning for autonomous systems via (co)homology computation", Gaithersburg, MD - March 2018.

"On Navigation, Planning and Verification of Autonomous Systems", School of Computing, Informatics, and Decision Systems Engineering, January, 2018.

"Sheaf Theoretic Abstraction and Composition of Complex Systems of Systems", Department of Mathematics/Institute for Mathematics and its Applications (IMA), Minneapolis, MN - February, 2017.

"Topological Abstraction and Planning for the Pursuit-Evasion Problem", Department of Computer Science, University of Minnesota, MN, December, 2016.

"On various applications of topological methods: From autonomous systems to privacy", ACCESS Alumni Day'16, Royal Institute of Technology (KTH), May, 2016.

"Topological Abstraction and Planning for the Pursuit-Evasion Problem", Institute for Mathematics and its Applications (IMA), Minneapolis, MN, part of the workshop on "Distributed Control and Decision Making Over Networks" - Invited Speaker, October, 2015.

"On Vehicle Localization: From Geometry to Topology", University of Notre Dame, Notre Dame, IN, August, 2014.

"Hierarchical Multi-Objective Planning for Autonomous Systems", Washington University, Seattle, WA, July 2014.

"From Homology Computation to Localization", Institute for Mathematics and its Applications (IMA), Minneapolis, MN, part of the workshop on "Topological Systems: Communication, Sensing, and Actuation" - Invited Speaker, March 3-7, 2014.

"Hierarchical Multi-Objective Planning for Autonomous Systems", UTC Institute for Advanced Systems Engineering, University of Connecticut, Storrs, CT, April, 2014.

"Path Planning Under Intermittent Sensing", MIT, Boston, MA, June, 2013.

"Autonomy at UTRC: An Overview", Brigham Young University, Provo, UT, January, 2013.

"Adaptive Filtering and Topological Methods for Positioning in GPS Denied Environ-

ments", University of Connecticut, Storrs, CT, November, 2012.

"Positioning in GPS Denied Environments: From Adaptive Filtering and Graph Embedding to Topological Methods", UIUC, Urbana-Champaign, IL, October, 2012.

"Distributed Algorithms for Multi-robot Localization", Robotics Institute, CMU, Pittsburgh, PA, March, 2012.

"Autonomous And Intelligent Systems At United Technologies Research Center", GRASP Lab, University of Pennsylvania, PA, USA, February, 2012.

"UTRC's Autonomy Project: An Overview". Center for Control, Dynamical Systems and Computation (CCDC), University of Santa Barbara, CA, USA, January, 2012.

"Hearing the Clusters in a Graph: A Distributed Algorithm". Department of Automatic Control, School of Electrical Engineering, Royal Institute of Technology, Sweden. February 2011.

"A Distributed Adaptive Estimator for Wireless Sensor Networks". Wireless Sensing Interest Group Meeting, Aston University, Birmingham, UK. September 2007.

"On Some Performance, Scalability and Implementation Issues in Multi-Robot Coordination". Robotics Group, Computer Science Department, Manchester University, UK. July 2007.

"A Distributed Minimum Variance Estimator for Wireless Sensor Networks". United Technologies Research Center, CT, USA. June 2007.

"On Some Distributed Algorithms over Wireless Sensor Networks". Complexity Theory and Algorithmic Group, Computer Science Department, Liverpool University, UK. November 2006.

"Consensus in Multi-Robot Control Systems". Automatic Control Group, Linköping University, Sweden. September 2006.

"Hybrid Communication Strategies for Multi-Agent Coordination". Automatic Control Group, Lund Institute of Technology, Sweden. June 2006.

"Communication Constraints in Average Consensus". United Technologies Research Center, CT, USA. Dec 2005.

Submitted

- [1] B. Fong, A. Speranzon and D.I. Spivak, *Temporal Landscapes: A Graphical Temporal Logic for Reasoning*, <https://arxiv.org/abs/1904.01081>, 2019.
- [2] A. Speranzon and R. Ghrist, *Topological Mapping via Uncooperative Sensing*, 2018.
- [3] J. Sharma, Z. Wang, A. Speranzon, V. Venkataraman and H. S. Park, *ECO: Egocentric Cognitive Mapping*, <https://arxiv.org/abs/1812.00312>, 2018.
- [4] A. Speranzon, D.I. Spivak and S. Varadarajan, *Abstraction, Composition and Contracts: A Sheaf Theoretic Approach*, <https://arxiv.org/abs/1802.03080>, 2018.

Journal Papers

- [1] S. D. Bopardikar, A. Speranzon, C. Langbort, *A Game-Theoretic Framework for Trusted Computation on an Adversarial Cloud*, In *Automatica*, 2017.
- [2] S. D. Bopardikar, B. Englot, A. Speranzon and J. van Der Berg, *Robust belief space planning under intermittent sensing via a maximum eigenvalue-based bound*, *International Journal on Robotics Research*, July, 2016.
- [3] Y. Xu, C. Fishione, and A. Speranzon, *Model Based Peer-to-Peer Estimator over Wireless Sensor Networks*, Volume 61, Pages 263–273, 2015.
- [4] S. D. Bopardikar, B. Englot and A. Speranzon, *Multi-Objective Path Planning: Localization Constraints and Collision Probability*, *IEEE Transaction on Robotics*, Volume 31, Number 3, Pages 562–577, 2015.
- [5] T. Sahai, A. Speranzon and A. Banaszuk, *Hearing the clusters in a graph: A distributed algorithm*. *Automatica*, Issue (48:1), Pages 15-24, January 2012. (*Among most downloaded papers on ScienceDirect – January to March 2012*).
- [6] A. Banaszuk, V. A. Fonoberov, T. A. Frewen, M. Kobilarov, G. Mathew, I. Mezic, A. Pinto, T. Sahai, H. Sane, A. Speranzon, A. Surana. *Scalable Approach to Uncertainty Quantification and Robust Design of Interconnected Dynamical Systems*. *Annual Reviews in Control*, Volume 35, Issue 1, Pages 77-98, April 2011.
- [7] A. Speranzon, C. Fischione, K. H. Johansson and A. Sangiovanni-Vicentelli. *Distributed estimation over wireless sensor networks*. *IEEE Journal on Selected Areas of Communication*, May, 2008.
- [8] B. Johansson, A. Speranzon, M. Johansson and K. H. Johansson. *On decentralized negotiation of optimal consensus*. *Automatica*, Issue (44:4), Pages 1175-1179 , April 2008.
- [9] R. Carli, F. Fagnani, A. Speranzon and S. Zampieri. *Communication constraints in the average consensus problem*. *Automatica*, Issue (44:3), Pages, 671-684 March 2008. (*Among most downloaded papers on ScienceDirect – January to March 2008*)
- [10] J. de Sousa, K. H. Johansson, J. Silva and A. Speranzon. *A verified hierarchical control architecture for coordinated multi-vehicle operations*. In the *International Journal of Adaptive Control and Signal Processing*, Volume 21, Issue 2-3, Pages 159 - 188, 2007.

- [11] E. Pagello, A. D'Angelo, C. Ferrari, R. Polesel, R. Rosati and A. Speranzon. *Emergent behaviors of a robot team performing cooperative tasks*. Advanced Robotics, Volume 15, Issue 1, Pages 3-20, 2003.
- [12] C. Altafini, A. Speranzon and B. Wahlberg. *A Feedback Control Scheme for Reversing a Truck and Trailer Vehicle*. In IEEE Transactions on Robotics and Automation, Volume 17, Issue 6, Pages 915-921, 2001.

Book Chapters

- [11] R. Carli, F. Fagnani, M. Focoso, A. Speranzon and S. Zampieri. *Symmetries in the coordinated consensus problem*. To appear in P. J. Antsaklis and P. Tabuada, Ed., NESC: Networked Embedded Sensing and Control, Lecture Notes in Control and Information Sciences, Springer, 2006.
- [12] C. Altafini, A. Speranzon, and K. H. Johansson. *Hybrid control of a truck and trailer vehicle*. In C. J. Tomlin and M. R. Greenstreet, Ed., Hybrid Systems: Computation and Control, Lecture Notes in Computer Science. Springer-Verlag. 2002.
- [13] P. de Pascalis, M. Ferraresso, M. Lorenzetti, A. Modolo, M. Peluso, R. Polesel, R. Rosati, N. Scattolin, A. Speranzon, W. Zhanette. *Golem team in middle-sized robots league*. In RoboCup-2000: Robot Soccer World Cup IV, P. Stone, T. Balch, and G. Kraetschmar, Ed., Springer-Verlag, Berlin, 2001.

Conference Proceedings

- [14] R. Ramaithitima, S. Srivastava, S. Bhattacharya, A. Speranzon and V. Kumar, *Hierarchical Strategy Synthesis for Pursuit-Evasion Problems*, To Appear at 22nd European Conference on Artificial Intelligence, 2016.
- [15] A. Speranzon and S. D. Bopardikar, *An Algebraic Topological Approach to Privacy*, Proceedings of American Control Conference, 2016.
- [16] S. D. Bopardikar, A. Speranzon and J., Hespanha, *An H-infinity Approach to Stealth-resilient Control Design*, To Appear at the symposium on Resilient Control, part of ResWeek'16, 2016.
- [17] S. D. Bopardikar, A. Speranzon and C. Langbort, *An Iterated Best Response Scheme for Trusted Computation on an Adversarial Cloud*, American Control Conference, 2015.
- [18] P. Niedfeld, A. Speranzon and A. Surana, *Distributed SLAM in Large Environments with Sporadic Updates*, International Conference on Robotics and Automation, 2015.
- [19] S. D. Bopardikar, B. Englot and A. Speranzon, *Multi-Objective Path Planning in GPS Denied Environments under Localization Constraints*, In the Proc. of American Control Conference, 2014.
- [20] R. Georgescu, S. Zhang, A. Surana, A. Speranzon and O. Erdinc, *Spectral Multi-scale Coverage with the Feature Aided CPHD Tracker*. Asilomar Conference on Signals, Systems and Computers, 2014.
- [21] X. Ding, B. Englot, A. Pinto, A. Speranzon, and A. Surana, *Hierarchical Multi-objective Planning: From Mission Specifications to Contingency Management*, In the Proc. of ICRA, 2014.

- [22] R. Georgescu, P. Niedfeldt, S. Zhang, A. Surana, A. Speranzon and O. Erdinc, *The CPHD and R-RANSAC Trackers Applied to the VIVID Dataset*. SPIE Signal and Data Processing of Small Targets, 2014.
- [23] S. D. Bopardikar, B. Englot and A. Speranzon, *Robust Belief Roadmap: Planning Under Uncertain And Intermittent Sensing*, In the Proc. of ICRA, 2014.
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- V. Kumar (UPenn), F. T. Pokorny (KTH) and S. Ramamoorthy (Edinburgh University), May, 2016.
- A. Speranzon *From Security to Trust Issues in CPS*. Workshop *Big Data Analytics for Societal Scale Cyber-Physical Systems: Energy Systems* at IEEE Conference on Decision and Control 2014. Organizers: L. J. Ratliff (UCB), R. Dong (UCB), H. Ohlsson (C3 Energy/UCB), S. Sastry (UCB), December, 2014
 - A. Speranzon *Panel Speaker at RSS'14 Workshop on Distributed Control and Estimation for Robotic Vehicle Networks*, Robotics Science and Systems. Invited to the panel: Prof. Vijay Kumar (UPenn), Prof. Jon How (MIT), Prof. Gaurav Sukhatme (USC), Prof. Jay Farrell (UCRiverside), Prof. Solmaz Kia (UCIrvine). Organizers: Prof. Jorge Cortez (UCSD), Prof. Sonia Martinez (UCSD) and Prof. Nisar Ahmed (CU), July, 2014.
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- B. Florentino, A. Tiwari, J. Marchioli and A. Speranzon, *Access Control Request Manager Based on Learning Profile Based Access Pathways*, Filed.
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