
CURRICULUM VITAE

MEHRAN MESBAHI

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Educational History

University of Southern California, Los Angeles, CA
Doctor of Philosophy, Electrical Engineering
1996; Dissertation: *Topics in Distributed Decision Making and Control*

University of Southern California, Los Angeles, CA
Master of Science, Mathematics
1995; M.S. Thesis: *Complementary Problems in Systems and Control*

University of Southern California, Los Angeles, CA
M.S. in Electrical Engineering
1991; M.S. Thesis: *Studies in Catastrophe Theory and Chaos*

California State University, Northridge, CA
1989; B.S. in Engineering (Summa Cum Laude)

Employment History

University of Washington, Seattle, WA
Endowed Professorship in Control Systems and Networks 3/17-present
Executive Director of Joint Center for Aerospace Technology Innovation 1/13-present
Professor, Department of Aeronautics & Astronautics 9/10-present
Adjunct Professor, Department of Mathematics 9/10-present
Adjunct Professor, Department of Electrical Engineering 9/15-present
Associate Professor, Department of Aeronautics & Astronautics 9/05-8/10
Assistant Professor, Department of Aeronautics & Astronautics 6/02-8/05

University of Minnesota, Minneapolis, MN
Assistant Professor, Aerospace and Mechanics 1/00-5/02

Jet Propulsion Laboratory
California Institute of Technology, Pasadena, CA
Member of Technical Staff 7/96-12/99

California Institute of Technology, Pasadena, CA
Lecturer, Control and Dynamical Systems 9/98-5/99

University of Southern California, Los Angeles, CA
Lecturer, Department of Electrical Engineering-Systems 9/97-5/98

Johnson Controls, Rancho Dominguez, CA
Control Systems Engineer 6/89-8/91

Awards and Honors

- Endowed University Professorship in Control Systems and Networks, 2017.
- Graduate Instructor of the Year, Department of Aeronautics & Astronautics, University of Washington, 2015.
- Fellow of IEEE, Class of 2015.
- Professor of the Year, Department of Aeronautics & Astronautics, University of Washington, Seattle, WA, June 2010.
- Professor of the Year, Department of Aeronautics & Astronautics, University of Washington, Seattle, WA, June 2008.
- Innovator Award, College of Engineering, University of Washington, Seattle, WA, May 2008.
- Professor of the Year, Department of Aeronautics and Astronautics University of Washington, Seattle, WA, June 2006.
- Distinguished Teaching Award, University of Washington, Seattle, WA, June 2005.
- NASA Space Act Award, The National Aeronautics and Space Administration, Arlington, VA, March 2005.
- Professor of the Year, Department of Aeronautics and Astronautics University of Washington, Seattle, WA, June 2004.
- NASA New Technology Award (NPO-20902), The National Aeronautics and Space Administration, Arlington, VA, March 2004.
- NSF CAREER Award, National Science Foundation, Arlington, VA, March 2001-2006.
- Shuttle Radar Topography Mission Star Award, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, June 2000.
- Cassini Attitude and Articulation Control Subsystem, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, May 1999.
- Achievement Award for the Cassini Program, The National Aeronautics and Space Administration, Arlington, VA, 1998.
- Outstanding Instructor, Department of Electrical Engineering - Systems University of Southern California, Los Angeles, CA, May 1997.
- Finalist, IEEE Control System Society Best Student Paper Award, *IEEE Conference on Decision and Control*, Kobe, Japan, December 1996.
- Teaching Assistant Award, Department of Mathematics, University of Southern California, Los Angeles, CA, June 1994.
- Outstanding Project Award (twice), Johnson Controls Institute, Milwaukee, WI, May 1990 and June 1992.
- Medallion of Academic Achievement and Excellence (Top 1% of the graduating class), California State University, CA, May 1989.

PUBLICATIONS

Books

- **M. Mesbahi** and M. Egerstedt, *Graph-theoretic Methods in Multi-agent Networks*, Princeton University Press, 2010.

Book Chapters

- A. Chapman, E. Schoof, and **M. Mesbahi**, Distributed Online Topology Design for Disturbance Rejection, in *Principles of Cyber-Physical Systems*, Cambridge University Press (to appear).
- **M. Mesbahi** and M. Egerstedt, Graphs for Modeling Network Interactions, *Encyclopedia of Systems and Control*, Springer, 2014.
- A. Chapman and **M. Mesbahi**, UAV Swarms: Models and Effective Interfaces, in *Handbook of Unmanned Aerial Vehicles*, Springer, 2014.
- D. Zelazo and **M. Mesbahi**, Graph-theoretic Methods for Networked Dynamic Systems: Heterogeneity and H_2 Performance, in *Efficient Modeling and Control of Large-Scale Systems*, Springer, 2010.
- **M. Mesbahi**, M. G. Safonov, and G. P. Papavassilopoulos, Bilinearity and complementarity in robust control, in *Advances in Linear Matrix Inequality Methods in Control*, SIAM, 2000.
- **M. Mesbahi** and G. P. Papavassilopoulos, Least elements and minimal rank matrices, in *Recent Advances in Complementarity Theory - State of the Art*, SIAM, 1997.

Archival Journal Publications

- P. Tsiotras and **M. Mesbahi**, Toward an Algorithmic Control Theory, *AIAA Journal of Guidance, Control, and Dynamics, Special Issue on Computational Guidance and Control*, 40: 194-196, 2017.
- H. Shao, **M. Mesbahi**, D. Li, Y. Xi, Inferring centrality from network snapshots, *Nature Scientific Reports* (doi:10.1038/srep40642), 2017.
- U. Lee and **M. Mesbahi**, Constrained autonomous precision landing via dual quaternions and model predictive control, *AIAA Journal of Guidance, Control, and Dynamics*, 40: 292-308, 2017.
- E. Schoof, A. Chapman and **M. Mesbahi**, Weighted Bearing-Compass Dynamics: Edge and Leader Selection, *Transactions on Network Science and Engineering* (in-press).
- S. Mousavi, M. Haeri, and **M. Mesbahi**, On the Structural and Strong Structural Controllability of Undirected Networks, *IEEE Transactions on Automatic Control* (to appear).
- A. D. González, A. Chapman, L. Dueñas-Osorio, **M. Mesbahi** and R. M. D'Souza, Efficient Infrastructure Restoration Strategies using the Recovery Operator, *Computer-Aided Civil and Infrastructure Engineering* (to appear).

- S. Hosseini, A. Chapman, and **M. Mesbahi**, Online distributed optimization on dynamic networks, *IEEE Transactions on Automatic Control*, 61 (11): 3545-3550, 2016.
- S. Hosseini and **M. Mesbahi**, Energy aware aerial surveillance for a long endurance solar-powered UAV, *AIAA Journal of Guidance, Control, and Dynamics*, 39 (9), 1980-1993, 2016.
- S. Hosseini, A. Chapman, and **M. Mesbahi**, Online distributed ADMM on networks, *Automatica* (submitted).
- U. Lee and **M. Mesbahi**, Spacecraft reorientation in presence of attitude constraints via logarithmic barrier potentials, *IEEE Transactions on Aerospace and Electronic Systems*, 50 (4): 2578-2592, 2014.
- A. Chapman, M. Nabi-Abdolyousefi, and **M. Mesbahi**, Controllability and observability of network-of-networks via Cartesian products, *IEEE Transactions on Automatic Control*, 59 (10): 1-12, 2014.
- P. Panyakeow, R. Dai, and **M. Mesbahi**, Deconfliction algorithms for a pair of constant speed unmanned aerial vehicles, *IEEE Transactions on Aerospace and Electronic Systems*, 50 (1): 456-476, 2014.
- R. Dai and **M. Mesbahi**, Optimal power generation and load management for off-grid hybrid power systems with renewable sources via mixed-integer programming, *Energy Conversion and Management*, 73: 234-244, 2013.
- M. Nabi-Abdolyousefi and **M. Mesbahi**, On the controllability of circulant networks, *IEEE Transactions on Automatic Control*, 58 (12): 3179-3184, 2013.
- R. Dai, J. Maximoff, and **M. Mesbahi**, Optimal path planning for establishing connectivity in proximity networks, *IEEE Transactions on Aerospace and Electronic Systems*, 49 (3): 1968-1981, 2013.
- A. Chapman and **M. Mesbahi**, Semi-autonomous consensus: network measures and adaptive trees, *IEEE Transactions on Automatic Control*, 58 (1): 19-31, 2013.
- M. Nabi-Abdolyousefi and **M. Mesbahi**, Network identification via node knock-outs, *IEEE Transactions on Automatic Control*, 57 (12): 3214-3219, 2012.
- M. Nabi-Abdolyousefi and **M. Mesbahi**, A sieve method for consensus-type network tomography, *IET Control Theory and Applications*, (6) 12: 1926-1932, 2012.
- I. Rajapakse, M. Groudine, and **M. Mesbahi**, What can systems theory of networks offer to biology? *PLoS Computational Biology*, 8 (6): e1002543. doi:10.1371/journal.pcbi.1002543, 2012.
- A. Chapman and **M. Mesbahi**, System theoretic aspects of influenced consensus: single input case, *IEEE Transactions on Automatic Control*, 57 (6): 1505-1511, 2012.
- D. Zelazo, R. Dai, and **M. Mesbahi**, An energy management system for off-grid power systems, *Energy Systems*, 3 (2): 153-179, 2012.
- Z. Wu and **M. Mesbahi**, Symplectic transformation based approach for linear quadratic control with terminal constraints, *SIAM Journal of Control and Optimization*, 50 (2): 652-671, 2012.

- I. Rajapakse, M. Groudine, and **M. Mesbahi**, Dynamics and control of state-dependent networks for probing genomic organization, *Proceedings of the National Academy of Sciences*, doi: 10.1073/pnas.1113249108, 2011.
- D. Zelazo and **M. Mesbahi**, Graph-theoretic analysis and synthesis of relative sensing networks, *IEEE Transactions on Automatic Control*, 56 (5): 971-982, 2011.
- D. Zelazo and **M. Mesbahi**, Edge agreement: graph-theoretic performance bounds and passivity analysis, *IEEE Transactions on Automatic Control*, 6 (3): 554-555, 2011.
- A. Das, Y. Hatano, and **M. Mesbahi**, Agreement over noisy networks, *IET Control Theory and Applications*, 4 (11): 2416-2426, 2010.
- Y. Kim, **M. Mesbahi**, G. Singh, and F. Y. Hadaegh. On the convex parameterization of constrained spacecraft reorientation, *IEEE Transactions on Aerospace and Electronic Systems*, 46 (3): 1097-1109, 2010.
- A. Das and **M. Mesbahi**, Distributed parameter estimation over sensor networks, *IEEE Transactions on Aerospace and Electronic Systems*, 45 (4): 1293-1306, 2009.
- J. Sandhu, **M. Mesbahi**, and T. Tsukamaki, On the control and estimation over relative sensing networks, *IEEE Transactions on Automatic Control*, 54 (12): 2859 - 2863, 2009.
- A. Rahmani, M. Ji, **M. Mesbahi**, and M. Egerstedt. Controllability of multi-agent systems from a graph theoretic perspective, *SIAM Journal on Control and Optimization*, 48 (1): 162-186, 2009.
- A. Rahmani, **M. Mesbahi**, and F. Y. Hadaegh, On the optimal balanced-energy formation flying maneuvers, *AIAA Journal of Guidance, Control, and Dynamics*, (29) 6: 1395-1403, 2006.
- Y. Kim and **M. Mesbahi**, On maximizing the second smallest eigenvalue of a state-dependent graph Laplacian, *IEEE Transactions on Automatic Control*, (51) 1: 116-120, 2006.
- Y. Hatano and **M. Mesbahi**, Agreement over random networks, *IEEE Transactions on Automatic Control*, (50) 11: 1867-1872, 2005.
- **M. Mesbahi**, On state-dependent dynamic graphs and their controllability properties, *IEEE Transactions on Automatic Control* (50) 3: 387- 392, 2005.
- Y. Kim and **M. Mesbahi**. Quadratically constrained attitude control via semidefinite programming, *IEEE Transactions on Automatic Control* (49) 5: 731-735, 2004.
- Y. Kim, **M. Mesbahi**, and F. Y. Hadaegh, Multiple-spacecraft reconfigurations through collision avoidance, bouncing, and stalemates, *Journal of Optimization Theory and its Applications*, (122) 2: 323-343, 2004.
- Y. Kim, **M. Mesbahi**, and F. Y. Hadaegh. Dual-spacecraft formation flying: optimal collision-free reconfigurations, *AIAA Journal of Guidance, Control, and Dynamics*, (26): 2, 375-379, 2003.
- **M. Mesbahi** and F. Y. Hadaegh. Mode and logic-based switching for the formation flying control of multiple spacecraft, *Journal of Astronautical Sciences*, 49 (3): 443-468, 2001.

- **M. Mesbahi** and F. Y. Hadaegh. Formation flying of multiple spacecraft via graphs, matrix inequalities, and switching, *AIAA Journal of Guidance, Control, and Dynamics*, (24) 2: 369-377, 2001.
- **M. Mesbahi**, Robustness analysis via the running time of the interior point methods, *Systems and Control Letters*, 44 (5): 355-361, 2001.
- **M. Mesbahi** and G. P. Papavassilopoulos, On the communication complexity of Lipschitzian optimization for the coordinated model of computation. *Journal of Complexity*, 16 (2): 459-473, 2000.
- **M. Mesbahi**, G. P. Papavassilopoulos, and V. K. Prasanna, On the parallel and VLSI implementation of the interior point methods, *International Journal of Modeling and Simulations*, 19 (4): 405-409, 1999.
- **M. Mesbahi**, Solving a class of rank minimization problems as semi-definite programs with applications to fixed order output feedback synthesis, *Systems and Control Letters*, 33 (1): 31-36, 1998.
- **M. Mesbahi** and G. P. Papavassilopoulos, On the rank minimization problem over a positive semi-definite linear matrix inequality, *IEEE Transactions on Automatic Control*, 42 (2): 239-243, 1997.
- **M. Mesbahi** and G. P. Papavassilopoulos, A cone programming approach to the bilinear matrix inequality problem and its geometry, *Mathematical Programming (B)*, 77 (2): 247-272, 1997.

Conference Papers

- J. Quenzer, B. Barzgaran, **M. Mesbahi**, K. Morgansen, The Generic Wide Body Aircraft Model, *AIAA Science and Technology Forum and Exposition (GN&C Conference)*, 2018 (to appear).
- T. Reynold and **M. Mesbahi**, Small Body Precision Landing via Convex Model Predictive Control, *AIAA SPACE and Astronautics Forum and Exposition*, 2017.
- U. Lee, T. Reynolds, B. Katona, B. Barzgaran, and **M. Mesbahi**, Development of Attitude Determination and Control Subsystem for 3U CubeSat with Electric Propulsion, *AIAA SPACE and Astronautics Forum and Exposition*, 2017.
- S. Vasisht and **M. Mesbahi**, A Data-driven Approach for UAV Tracking Control, *ASME Dynamic Systems and Control Conference*, 2017.
- A. Chapman, A. Gonzalez, **M. Mesbahi**, L. Duenas-Osorio, and R. D'Souza, Data-guided Control: Clustering, Graph Products, and Decentralized Control, *IEEE Conference on Decision and Control*, 2017.
- D-J. Chen and **M. Mesbahi**, Constrained Attitude Control, PSD Lifts, and Semidefinite Programming, *IEEE Conference on Decision and Control*, 2017.

- M. Hudoba de Badyn, S. Alemzadeh, and **M. Mesbahi**, Controllability and Data-Driven Identification of Bipartite Consensus on Nonlinear Signed Networks, *IEEE Conference on Decision and Control*, 2017.
- M. El Chamie, B. Acikmese, and **M. Mesbahi**, Online Learning for Markov Decision Processes Applied to Multi-Agent Systems, *IEEE Conference on Decision and Control*, 2017.
- S. Alemzadeh, M. Hudoba de Badyn, and **M. Mesbahi**, Controllability and Stabilizability of Signed Consensus Networks, *IEEE Conference on Control Technology and Applications*, 2017.
- M. Hudoba de Badyn and **M. Mesbahi**, Large Scale Distributed Kalman Filtering via an Optimization Approach, *IFAC World Congress*, 2017.
- H. Shao, Y. Xi, **M. Mesbahi**, and D. Li, Relative Tempo of Multiplex Consensus Networks, *IFAC World Congress*, 2017.
- A. Atiye, K. Morgansen, and **M. Mesbahi**, Adaptive Communication Networks with Privacy Guarantees, *American Control Conference*, 2017.
- S. Mousavi, M. Haeri, and **M. Mesbahi**, Robust Strong Structural Controllability of Networks with Respect to Edge Additions and Deletions, *American Control Conference*, 2017.
- K. K. Wu, Y. Yam, H. Meng, and **M. Mesbahi**, Parallel Probabilistic Swarm Guidance by Exploiting Kronecker Product Structures in Discrete-Time Markov Chains, *American Control Conference*, 2017.
- K. K. Wu, Y. Yam, H. Meng, and **M. Mesbahi**, “Kronecker product approximation with multiple factor matrices via tensor product algorithm,” *IEEE International Conference on Systems, Man, and Cybernetics*, 2016.
- L. Pan, H. Shao, and **M. Mesbahi**, “Laplacian dynamics on signed networks,” *IEEE Conference on Decision and Control*, 2016.
- D. Meng, M. Fazel, and **M. Mesbahi**, “Online algorithms for network formation,” *IEEE Conference on Decision and Control*, 2016.
- A. Chapman, E. Schoof, and **M. Mesbahi**, “Pattern control for networks of Ginzburg-Landau oscillators via Markov decision processes,” *IEEE Conference on Decision and Control*, 2016.
- R. Eghbali, M. Fazel, and **M. Mesbahi**, “Worst case competitive analysis for online conic optimization,” *IEEE Conference on Decision and Control*, 2016.
- M. Hudoba de Badyn and **M. Mesbahi**, “Growing controllable networks via whiskering and submodular optimization,” *IEEE Conference on Decision and Control*, 2016.
- A. Chapman and **M. Mesbahi**, “Multiple time-scales in networks-of-networks,” *American Control Conference*, 2016.
- L. Pan, H. Shao, **M. Mesbahi**, “Verification and prediction of structural balance: a data-driven perspective,” *American Control Conference*, 2016.

- D. Meng, M. Fazel, and **M. Mesbahi**, "Proximal alternating direction method of multipliers for distributed optimization on weighted graphs," *IEEE Conference on Decision and Control*, 2015.
- M. Hudoba de Badyn, A. Chapman, and **M. Mesbahi**, "Network entropy: a system-theoretic perspective," *IEEE Conference on Decision and Control*, 2015.
- H. Shao, Y. Xi, and **M. Mesbahi**, "On the degree of synchrony," *IEEE Conference on Decision and Control*, 2015.
- Awad, A. Chapman, E. Schoof, A. Narang-Siddarth, and **M. Mesbahi**, "Time-scale separation on networks: consensus, tracking, and state-dependent interactions," *IEEE Conference on Decision and Control*, 2015.
- Chapman and **M. Mesbahi**, "State controllability, output controllability and stabilizability of networks: a symmetry perspective," *IEEE Conference on Decision and Control*, 2015.
- U. Lee and **M. Mesbahi**, "Optimal Power Descent Guidance with 6-DoF Line of Sight Constraints via Unit Dual Quaternions," *AIAA Guidance, Navigation, and Control Conference*, 2015.
- E. Schoof, A. Chapman and **M. Mesbahi**, "Efficient leader selection for translation and scale of a bearing-compass formation," *IEEE International Conference on Robotics and Automation*, 2015.
- H. Shao, L. Pan, and **M. Mesbahi**, "A Data-driven approach for influencing consensus networks," *American Control Conference*, 2015.
- H. Shao and **M. Mesbahi**, "On the Fiedler vector of graphs and its application in consensus networks," *American Control Conference*, 2015.
- S. Vasisht and **M. Mesbahi**, "Trajectory Design and Coverage Control for Solar-Powered UAVs," *AIAA Guidance, Navigation, and Control Conference*, 2015.
- S. Hosseini, A. Chapman, and **M. Mesbahi**, "Online distributed ADMM via dual averaging," *IEEE Conference on Decision and Control*, 2014.
- A. Chapman and **M. Mesbahi**, "On symmetry and controllability of multi-agent systems," *IEEE Conference on Decision and Control*, 2014.
- U. Lee, D. Besson, and **M. Mesbahi**, "Fast inertia property estimation via convex optimization for the asteroid redirect mission," *IEEE Conference on Decision and Control*, 2014.
- E. Schoof, A. Chapman and **M. Mesbahi**, "Bearing-compass formation control: A human-swarm interaction perspective," *American Control Conference*, 2014.
- H. Shao and **M. Mesbahi**, "Degree of Relative Influence for Consensus-type Networks," *American Control Conference*, 2014.
- S. Hosseini, R. Dai, and **M. Mesbahi**, "An online dual-averaging mixed-integer programming approach for power management," *American Control Conference*, 2014.

- U. Lee and **M. Mesbahi**, “Dual quaternion based spacecraft rendezvous with rotational and translational field of view constraints,” *AIAA/AAS Astrodynamics Specialist Conference*, 2014.
- A. Chapman, E. Schoof and **M. Mesbahi**, “Distributed online topology design for disturbance rejection,” *IEEE Conference on Decision and Control*, 2013.
- S. Hosseini, A. Chapman and **M. Mesbahi**, “Online distributed optimization via dual averaging,” *IEEE Conference on Decision and Control*, 2013.
- A. Chapman and **M. Mesbahi**, “On strong structural controllability of networked systems: A constrained matching approach,” *American Control Conference*, 2013.
- P. Panyakeow and **M. Mesbahi**, “Optimal trajectory for network establishment for remote UAVs,” *American Control Conference*, 2013.
- S. Hosseini, R. Dai, and **M. Mesbahi**, “Optimal path planning and power allocation for a long endurance solar-powered UAV,” *American Control Conference*, 2013.
- S. Hosseini and **M. Mesbahi**, “Energy aware aerial surveillance for a long endurance solar-powered UAV,” *AIAA Guidance, Navigation and Control Conference*, 2013.
- U. Lee and **M. Mesbahi**, “Optimal spacecraft reorientation under complex attitude constrained zones,” *AAS/AIAA Astrodynamics Specialist Conference*, 2013.
- A. Chapman, M. Nabi-Abdolyousefi and **M. Mesbahi**, “On the controllability and observability of Cartesian product networks,” *IEEE Conference on Decision and Control*, 2012.
- A. Chapman, E. Schoof and **M. Mesbahi**, “Advection on networks with an application to decentralized load balancing,” *IEEE International Conference on Intelligent Robots and Systems*, 2012.
- A. Chapman and **M. Mesbahi**, “Cartesian products on Z-Matrix networks: Factorization and interval analysis,” *International Symposium on Mathematical Theory of Networks and Systems*, 2012.
- U. Lee and **M. Mesbahi**, “Dual quaternions, rigid body mechanics, and powered-descent guidance,” *IEEE Conference on Decision and Control*, 2012.
- M. Nabi-Abdolyousefi, M. Fazel, and **M. Mesbahi**, “Graph identification via transfer matrices, similarity transformations, and matrix approximations,” *IEEE Conference on Decision and Control*, 2012.
- R. Dai, U. Lee, S. Hosseini, and **M. Mesbahi**, “Optimal sun path planning for solar-powered UAVs based on unit quaternions,” *IEEE Conference on Decision and Control*, 2012.
- N. Moshtagh, A. Ahmadi, and **M. Mesbahi**, “Feasibility checks and control laws for reconfiguration of spacecraft clusters,” *American Control Conference*, 2012.
- A. Chapman and **M. Mesbahi**, “Stability analysis of nonlinear networks via M-matrix theory: Beyond linear consensus,” *American Control Conference*, 2012.

- U. Lee and **M. Mesbahi**, “Spacecraft attitude synchronization in presence of constrained zones,” *American Control Conference*, 2012.
- R. Dai, J. Maximoff, and **M. Mesbahi**, “Establishment of proximity networks,” *American Control Conference*, 2012.
- R. Dai, J. Maximoff, and **M. Mesbahi**, “Formation of connected networks for fractionated spacecraft,” *AIAA Guidance, Navigation and Control Conference*, 2012.
- M. Nabi-Abdolyousefi and **M. Mesbahi**, “System theory over random networks: controllability and optimality properties,” *IEEE Conference on Decision and Control*, 2011.
- U. Lee and **M. Mesbahi**, “Constrained consensus via Log barrier function,” *IEEE Conference on Decision and Control*, 2011.
- A. Chapman and **M. Mesbahi**, “Advection on graphs,” *IEEE Conference on Decision and Control*, 2011.
- A. Chapman, R. Dai and **M. Mesbahi**, “Network topology design for UAV flocking with wind gusts,” *AIAA Guidance, Navigation and Control Conference*, 2011.
- A. Chapman and **M. Mesbahi**, “UAV Flocking with Wind Gusts: Adaptive Topology and Model Reduction,” *American Control Conference*, 2011.
- R. Dai and **M. Mesbahi**, “Optimal topology design for dynamic networks,” *IEEE Conference on Decision and Control*, 2011.
- R. Dai, U. Lee and **M. Mesbahi**, “Distributed orbit determination via estimation consensus,” *AAS/AIAA Flight Mechanics Conference*, 2011.
- M. Nabi-Abdolyousefi and **M. Mesbahi**, “Coordinated decentralized estimation over random networks,” *American Control Conference*, 2011.
- U. Lee and **M. Mesbahi**, “Spacecraft reorientation in presence of attitude constraints via logarithmic barrier potentials,” *American Control Conference*, 2011.
- A. Chapman and **M. Mesbahi**, “Semi-Autonomous networks: network resilience and adaptive trees,” *IEEE Conference on Decision and Control*, 2010.
- N. Moshtagh, R. Mehra, **M. Mesbahi**, “Topology control of dynamic networks in the presence of local and global constraints,” *ICRA*, 2010.
- A. Chapman and **M. Mesbahi**. “Adaptive trees,” *American Control Conference*, 2010.
- A. Chapman and **M. Mesbahi**, “Semi-autonomous networks: network resilience and adaptive trees,” *IEEE Conference on Decision and Control*, 2010.
- M. Nabi-Abdolyousefi and **M. Mesbahi**, “Network identification via node knock-out,” *IEEE Conference on Decision and Control*, 2010.

- A. Chapman and **M. Mesbahi**, "Semi-autonomous robotics networks: theory and agent local protocols," *ICRA*, 2010.
- A. Chapman, M. Nabi-Abdolyousefi, and **M. Mesbahi**, "Identification and infiltration in consensus-type networks," *IFAC Workshop on Estimation and Control of Networked Systems*, 2009.
- D. Zelazo and **M. Mesbahi**, "Analysis and synthesis of networked dynamic systems with H_2 performance," *American Control Conference*, 2009.
- D. Zelazo and **M. Mesbahi**, " H_2 performance of relative sensing networks," *AIAA Infotech*, 2009.
- D. Zelazo and **M. Mesbahi**, "On the observability properties of homogenous and heterogeneous network dynamic systems," *IEEE Conference on Decision and Control*, 2008.
- A. Rahmani, **M. Mesbahi**, N. Fathpour, F. Y. Hadaegh, "Observability and estimation of distributed space systems via local information-exchange networks," *AIAA Guidance, Navigation, and Control Conference*, 2008.
- A. Rahmani, K. Kosuge, T. Tsukamaki, **M. Mesbahi**, "UAV deconfliction via navigation functions," *AIAA Guidance, Navigation, and Control Conference*, 2008.
- M. Nabi-Abdolyousefi, **M. Mesbahi**, N. Fathpour, F. Y. Hadaegh, "Local estimators for multiple spacecraft formation flying," *AIAA/AAS Astrodynamics Specialist Conference*, 2008.
- **M. Mesbahi**, "On the agreement dynamics over graph products: decomposition and observability," *Mediterranean Control Conference*, 2008.
- D. Zelazo, A. Rahmani, J. Sandhu, and **M. Mesbahi**, "Decentralized formation control via the edge Laplacian," *American Control Conference*, 2008.
- A. Nyguen and **M. Mesbahi**, "A factorization lemma for the agreement dynamics," *IEEE Conference on Decision and Control*, 2007.
- D. Zelazo, A. Rahmani, and **M. Mesbahi**, "Agreement via the edge Laplacian," *IEEE Conference on Decision and Control*, 2007.
- A. Rahmani and **M. Mesbahi**, "Controlled agreement over networks: anchoring, controllability, and graph automorphisms," *American Control Conference*, 2007.
- A. Das and **M. Mesbahi**, "Distributed linear parameter estimation in sensor networks," *IEEE Conference on Sensor, Mesh, and Ad Hoc Communications and Networks*, 2006.
- A. Rahmani and **M. Mesbahi**, "On the controlled agreement problem," *American Control Conference*, 2006.
- Y. Hatano, A. Das, and **M. Mesbahi**, "Agreement in presence of noise: pseudogradients on random geometric networks," *IEEE Conference on Decision and Control*, 2005.
- J. Sandhu, **M. Mesbahi**, and T. Tsukamaki, "Relative sensing networks: observability, estimation, and the control structure," *IEEE Conference on Decision and Control*, 2005.

- J. Sandhu, **M. Mesbahi**, and T. Tsukamaki, "Cuts and flows in relative sensing and control of spatially distributed systems," *American Control Conference*, 2005.
- A. Rahmani and **M. Mesbahi**, "Optimized balanced-energy formation flying maneuvers," *AIAA Guidance, Navigation, and Control Conference*, 2005.
- Y. Kim and **M. Mesbahi**, "On maximizing the second smallest eigenvalue of a state-dependent Laplacian," *American Control Conference*, 2005.
- A. K. Das, **M. Mesbahi**, and Y. Kim, "On K -node survivable power efficient topologies in wireless networks with sectored antennas," 2005.
- Y. Hatano and **M. Mesbahi**, "Agreement over random networks," *IEEE Conference on Decision and Control*, 2004.
- **M. Mesbahi**, "On state-dependent dynamic graphs and their controllability properties," *IEEE Conference on Decision and Control*, 2004.
- Y. Kim, **M. Mesbahi**, G. Singh, and F. Y. Hadaegh, "On the constrained attitude control problem," *AIAA Guidance, Navigation, and Control*, 2004.
- Y. Kim and **M. Mesbahi**, "On the rank minimization problem," *American Control Conference*, 2004.
- **M. Mesbahi**, "State-dependent graphs," *IEEE Conference on Decision and Control*, 2003.
- Y. Kim and **M. Mesbahi**, "Quadratically constrained attitude control via semidefinite programming," *IEEE Conference on Decision and Control*, 2003.
- Y. Shao, **M. Mesbahi**, and G. Balas, "Planing, switching, and supercavitating flight control," *AIAA Guidance, Navigation, and Control Conference*, 2003.
- **M. Mesbahi**, "On a dynamic extension of the theory of graphs," *American Control Conference*, 2002.
- **M. Mesbahi** and F. Y. Hadaegh, "Mode and logic-based switching for the formation flying of multiple spacecraft," *American Control Conference*, 2001.
- **M. Mesbahi**, "Towards an algorithmic theory of robustness," *American Control Conference*, 2001.
- **M. Mesbahi** and F. Y. Hadaegh, "Switching control strategies for the uv-plane coverage," *AAS Guidance and Control Conference*, 2000.
- **M. Mesbahi**, "A semi-Definite programming approach for the solution of the least order dynamic output feedback and related problems," *IEEE Conference on Decision and Control*, 1999.
- **M. Mesbahi** and F. Y. Hadaegh, "Formation flying control of multiple spacecraft: graph theoretic properties and switching schemes," *AIAA Guidance, Navigation, and Control Conference*, 1999.

- **M. Mesbahi** and F. Y. Hadaegh, "A robust control approach for the formation flying of multiple spacecraft," *European Control Conference*, 1999.
- **M. Mesbahi** and F. Y. Hadaegh, "Formation flying control of multiple spacecraft via graphs, matrix inequalities, and switching," *IEEE Conference on Control Applications*, 1999.
- **M. Mesbahi** and F. Y. Hadaegh, "Reconfigurable control for the formation flying of multiple spacecraft," *International Multi-Conference on Circuits, Systems, and Control*, 1999.
- **M. Mesbahi**, "Least order dynamic output feedback synthesis is polynomial-time solvable," *American Control Conference*, June 1999.
- **M. Mesbahi** and F. Y. Hadaegh, "A switching mechanism for the formation flying control," *American Control Conference*, 1999.
- L. Gurvits and **M. Mesbahi**, "A polynomial-time algorithm for solving certain classes of rank minimization problem," *American Control Conference*, 1999.
- **M. Mesbahi**, "On robustness measures and the feasible set of the LMIs arising in stability analysis," *American Control Conference*, 1998.
- **M. Mesbahi**, "A complexity theoretic perspective on robustness analysis," *AIAA Guidance, Navigation, and Control Conference*, 1997.
- **M. Mesbahi** and G. P. Papavassilopoulos, "On the fixed order output feedback synthesis," *American Control Conference*, 1997.
- **M. Mesbahi** and G. P. Papavassilopoulos, "LMIs, interior point methods, complexity theory, and robustness analysis," *IEEE Conference on Decision and Control*, 1996.
- **M. Mesbahi**, G. P. Papavassilopoulos, and M. G. Safonov, "Matrix cones, complementarity problems, and the bilinear matrix inequality," *IEEE Conference on Decision and Control*, 1995.
- **M. Mesbahi** and G. P. Papavassilopoulos, "Some recent matrix problems in control theory - linear, bilinear, and complementarity problems," *International Conference on Complementarity Problems*, John Hopkins University, 1995.
- **M. Mesbahi** and G. P. Papavassilopoulos, "On the geometry of the bilinear matrix inequalities," *American Mathematical Society Summer Seminar on Mathematics of Numerical Analysis*, Park City, Utah, 1995.
- **M. Mesbahi**, G. P. Papavassilopoulos, and V. K. Prasanna, "On the parallel and VLSI implementation of the interior point methods for linear programming," *International Conference on Parallel and Distributed Computing and Systems*, 1994.

Technical Reports

- A. Ahmed, J. Alexander, D. Boussalis, W. Breckenridge, G. Macala, **M. Mesbahi**, M. San Martin, G. Singh, and E. Wong, *Cassini Control Analysis Book*, Jet Propulsion Laboratory, 1997.

- **M. Mesbahi**, "On the optimal fuel/time maneuvers for ST3," Technical Memorandum, Jet Propulsion Laboratory, October 1999.
- **M. Mesbahi**, "On the effect of delays in the formation flying control performance in DS-3," Technical Memorandum, Jet Propulsion Laboratory, October 1998.
- **M. Mesbahi**, "Reconfigurable control strategies for formation flying." Technical Memorandum, Jet Propulsion Laboratory, December 1997.
- **M. Mesbahi**, "Control and estimation algorithms for spacecraft moving in formation," Technical Memorandum, Jet Propulsion Laboratory, November 1996.
- **M. Mesbahi**, "Studies on catastrophe theory and chaos," Technical Report, University of Southern California, May 1991.
- **M. Mesbahi**, "Studies on traffic dynamics," Technical Report, University of Southern California, August 1991.

Miscellaneous

- **M. Mesbahi**, *Lecture notes on Optimization*, can be downloaded at www.aa.washington.edu/faculty/mesbahi/courses/aem8426/weeks-0-11.pdf
- **M. Mesbahi**, *Matrix Inequalities, Stability Theory, Interior Point Methods, and Distributed Computation*, Ph.D. Dissertation, Department of Electrical Engineering - Systems, University of Southern California, Los Angeles, CA, Jun. 1996.
- **M. Mesbahi**, *Complementarity Problems in Systems and Control*, Master's Thesis, Department of Mathematics, University of Southern California, Los Angeles, CA, May 1995.

OTHER SCHOLARLY ACTIVITY

Invited Lectures and Seminars

- Towards an Algorithmic Control Theory, Aerospace Control and Guidance Committee Meeting, Tukwila, November 2017.
- Autonomous Pin-point Moon Landing, Johnson Space Center, June 2017.
- Adaptive State-dependent Networks, MIT, April 2017.
- Dynamic Networks: Geometric and Algebraic Aspects of Distributed Learning, University of Minnesota, May 2015.
- State-dependent Dynamic Networks: A System Theoretic Perspective, Institute for Mathematics and Applications, University of Minnesota, October 2015.

- Networked Systems: Influence Geometry, Compositional Algebra, and Distributed Learning, University of Southern California, April 2015.
- Autonomy in Space, Iowa State University, March 2015.
- Autonomous Networked Aerospace Systems, University of Southern California, October 2014.
- Optimization on Networks, West Coast Optimization Workshop, University of Washington, May 2014.
- Dynamic Network Formation: A Control Theoretic Perspective, University of Michigan, March 2014.
- Distributed Online Optimization on Networks, ONR Workshop on Online Optimization, December 2013.
- Network-centric Aspects of Disturbance Rejection, AFOSR Workshop on Dynamics and Control, August 2013.
- Structural and Algebraic Aspects of Networked Systems, Dynamics and Controls Group, Georgia Institute of Technology, November 2012.
- Human-Swarm Interaction, AFOSR Workshop on Dynamics and Control, August 2012.
- Featured Speaker, UW College of Engineering Fall Series (*Re-engineering Aerospace*) 2011 (also on UWTV)
- Control Theory of Networks, Foundations of Computational Mathematics, Budapest, July 2011.
- State-dependent Networks: Theory and Applications, UCSB Workshop on Networked Systems, UC Santa Barbara, June 2011.
- Towards a System Theory on Networks, 4th Semi-annual Workshop on Control Systems (Plenary Speaker), Montreal, May 2011.
- System Theory on Networks, Annual Symposium of Decision and Control Laboratory (Plenary Speaker), Georgia Tech, April 2011.
- Dynamic Security of Networks, AFOSR Workshop on Complex Networks, Washington D.C., November 2010.
- System theory over networks, Department of Mathematics, University of Washington, May 2009.
- Formation Control: A Network-theoretic Perspective, CNRS, University of Bordeaux, France, July 2009.
- System Theory over Networks, Department of Mathematics, University of Washington, May 2009.

- Fly Me to the Moon: Johannes Kepler and the Science of Space Travel, Distinguished Teaching Awardees Showcase, University of Washington, May 2009.
- Recent Developments in Networked Systems, University of California, Santa Barbara, April 2009.
- Distributed Estimation, Jet Propulsion Laboratory, California Institute of Technology, August 2008.
- Combinatorics of Networked Autonomous Systems, Department of Mechanical and Aerospace Engineering, UCLA, May 2007.
- Controllability and Observability of Networked Dynamic Systems, Swarms Workshop, University of Pennsylvania, May 2007.
- Challenges in the Control of Multiple Spacecraft Formation Flying, Undergraduate Seminar, Department of Aeronautics and Astronautics, University of Washington, February 2007.
- An Eclectic set of Problems and Results in Distributed Networked Systems, UCLA, May 2006.
- Networked Dynamic Systems, Applied Mathematics, University of Washington, February 2006.
- Agreement in Noise, RCM Colloquium, University of Washington, February 2006.
- Distributed Spacecraft: how and why? Research Exposed, University of Washington, October 2005.
- Dynamics over graphs, Symposium on Swarms and Cooperative Control, Napa Valley, August 2005.
- Coordination over Random Networks, Jet Propulsion Laboratory, California Institute of Technology, December 2004.
- On constrained Attitude Control and Spacecraft Formation Flying, Department of Aeronautics and Astronautics, Stanford University, October 2004.
- State-dependent Graphs and Distributed Systems, Department of Electrical and Systems Engineering, University of Pennsylvania, April 2004.
- State-Dependent Graphs, Centre Automatique et Systemes, Fontainebleau, France, January 2004.
- Non-convex methods for Formation Reconfigurations, Jet Propulsion Laboratory, California Institute of Technology, November 2003.
- State-dependent Graphs over Distributed Dynamic Systems, Department of Control and Dynamical Systems, Caltech, November 2003.
- Switching Control Laws for Formation Flying, Jet Propulsion Laboratory, California Institute of Technology, November 2001.

- Bilinear Matrix Inequalities in Robust Control, Workshop on LMI methods in identification, optimization, and control, Universite de Technologie de Compiegne (UTC), Compiegne, France, May 1999.
- Multiple Spacecraft Formation Flying, Department of Aerospace Engineering and Mechanics, University of Minnesota- Twin Cities, March 1999.
- Matrix Inequalities and their Applications in System Theory, Department of Electrical Engineering, Iowa State University, April 1999.
- Matrix Rank Optimization and Distributed Dynamic Systems, Department of Electrical Engineering, University of Toronto, March 1999.
- Bilinear Matrix Inequalities in Control, Department of Control and Dynamical Systems, Caltech, November 1998.
- Optimization in System Sciences, Department of Electrical and Computer Engineering, University of Illinois at Urbana Champaign, November 1996.
- Algorithmic Methods for Complexity Analysis in Systems and Control, Jet Propulsion Laboratory, California Institute of Technology, April 1996.
- An Algorithmic Approach to Control Synthesis and Robustness Analysis, Center for Control Engineering and Computation, University of California- Santa Barbara, April 1996.

Professional Society Memberships

- American Institute of Aeronautics and Astronautics 1996-present
- Institute of Electrical and Electronics Engineers, Fellow 1986-present
- Society of Industrial and Applied Mathematics 1998-2008
- American Mathematical Society 1992-1995
- Mathematical Association of America 1995-2008

Other (referee services)

- Guest Editor, AIAA Journal of Guidance, Control, and Dynamics, 2015
- Associate Editor, Transactions on Network Science and Engineering, 2014-present
- Associate Editor, Transactions on Network Control Systems, 2013-present
- Associate Editor, Transactions on Control Systems Technology, 2007-2014
- Operating Committee, American Control Conference, 2014
- Technical Program Committee, IEEE Conference on Decision and Control, 2014
- Program Committee, American Control Conference, 2008
- Program Committee, International Conference on Robot Communication and Coordination, 2009
- Program Committee, International Conference on Robot Communication and Coordination, 2008

- Reviewer: Conference on Decision and Control, American Control Conference, Transactions on Automatic Control, Journal of Guidance, Control, and Dynamics, Transactions on Signal Processing Transactions on Circuits and Systems, Automatica, Transactions on Control Systems Technology Systems and Control Letters, International Journal of Control, Journal of Robust and Nonlinear Control

GRADUATE STUDENTS/POST-DOCTORAL FELLOWS

Post Doctoral Fellows

Name	Research Title	Period
Afshin Mesbahi	Dynamics and Control of Networks	6/2017-present
Airlie Chapman	Control of Complex Networks	9/2013-6/2017
Unsik Lee	Autonomous Asteroid Retrieval and Solar Electric Propulsion	4/2014-9/2016
Marzieh Nabi (currently at Xerox PARC)	Distributed estimation and control	8/2012-1/2013
Ran Dai (currently at Iowa State)	Aircraft energy optimization	9/2010-8/2012
Dan Zelazo	System-theoretic Aspects of Network Performance	6/09-12/09
Dr. Aranya Chakraborty (currently at NC State)	Advanced control and estimation algorithms for next generation aircraft power systems	9/08-6/09
Dr. Arindam Das (currently at APL/UW)	Distributed algorithms for networks, optimized energy networks	2/05-8/07

Chaired/Co-chaired Doctoral Degrees

Student Name	Dissertation Topic	Current Employer	Current/ Completed
Taylor Reynolds	Constrained spacecraft motion planning	University of Washington	Current
Mathias Hudoba de Badyn	Dynamic Networks and State-dependency	University of Washington	Current
Soumya Vasisht	Distributed UAV systems	University of Washington	Current
Siavash Alemzadeh	Distributed Optimization on Networks	University of Washington	Current
Jingjing Bu	Distributed Learning and Control	University of Washington	Current
Bijan Barzgaran	Model Predictive Flight control	University of Washington	Current
Dillon Foight	Control of Multi Time-scale Networks	University of Washington	Current
Dian-Jing Chen	Nonconvex Optimization with Aerospace Applications	University of Washington	Current
Eric Schoof	Distributed Robotic Systems	University of Melbourne	2017
Saghar Hosseini	Online distributed Optimization	Microsoft	2016

Prachya Panyakeow	Autonomous flight in complex environments	Boeing	2015
Unsik Lee	Advance GN&C Algorithms for Monolithic and Distributed Space Systems	University of Washington	2014
Airlie Chapman	System theory of Networked Systems	University of Melbourne	2013
Marzieh Nabi	Topics in Distributed Estimation and Control: Randomness, Structure, and Identification	Palo Alto Research Center	2012
Dan Zelazo	Performance of Networked Systems: a System-Theoretic Perspective	Technion	2010
Amirreza Rahmani	Networked Dynamic Systems: Theory and Applications	Jet Propulsion Laboratory	2008
Yoonsoo Kim	Topics in Distributed Networked Dynamic Systems	Gyeongsang National University	2005

Chaired/Co-chaired Masters Degrees

Student Name	Level of Supervision	Thesis/Project Title	Completed
Aditye Deole	Thesis	Distributed Robotics	Current
Tom Miesen	Thesis	Hardware Testbed for Autonomy	Current
Guen Kim	Thesis	Next Generation Air Traffic Management	2016
Nat Guy	Thesis	Spacecraft formation flight	2016
Will Howerton	Thesis	Robotic Convoy	2017
Robert Vasil	Thesis	Distributed observability	2015
David Besson	Thesis	Asteroid capture mission	2015
Joshua Maximoff	Project	Distributed cooperative control	2012
Clayton Chu	Thesis	Software-enable Control	2012
Kyle Hughes	Thesis	Halo orbit control	2010
Nick Burgan-Illic	Project	Distributed robotic search	2011
Brian Heemstra	Project	Quadrotor dynamics and control	2009
Allan Matthew	Thesis	Control of a rigid spacecraft using electrodynamic propulsion	2007
Aurelie Heritier	Thesis	Study of a formation Flying on a Halo Orbit near the L_2 Lagrangian point of the Sun-Earth system	2007
Anna Nguyen	Project	Consensus over Product Graphs	2007
Kunihiko Kosuge	Project	UAV deconfliction via Navigation Functions	2007
Markus Holzinger	Thesis	Europa Formation Flying Control	2005
Min-Zu Tsai	Project	Robust Formation Flying	2005
Jasmine Sandhu	Thesis	Relative Sensing Networks: Estimation and Control	2005
Yuko Hatano (MSAA)	Thesis	Agreement over random networks	2004
Y. Shao	Thesis (UMN)	Supercavitating vehicle control	2003

Seonho Kim	Project (UMN)	Software testbed for distributed systems	2002
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Visiting Faculty and Researchers Supervised

Name	Research Topic	Period
Shima Mousavi	Structural Controllability	3/2016-12/2016
Yeung Yam	Robotic Networks	7/2015-8/2015
Lulu Pan	Network System Decomposition	1/2014-12/2016
Haibin Shao	Human-swarm Interaction	9/2012-9/2014
Prof. Zhigang Wu	Formation flying via optimal control	9/06-8/07
Testujiro Ninomiya	Estimation algorithms for distributed space systems	9/05-6/06

Undergraduate Student Research Advising

Student Name	Level of Supervision	Thesis/Paper Title/Topic	Completed
Andrew Girardeau-Dale	Research Project	Distributed Robotics Hardware Testbed	2012
Zahra Nazari	Research Project	Quadrotor control	2010
Josh Ross	Research Project	Robotic networks	2009
Jonathan Tu	Research Project	Synchronization of large scale networks	2007
Kevin Yee	Research Project	Robotic Testbed	2007
Ronan Kennedy	Research Project	Trajectory design for Mars Bio-satellite	2004
Garrent Teahan	Research Project	Autonomous formation flying sensor	2004
Amer Fejzic	Research Project	J_2 modeling for Mars formation flying missions	2004
Leslie Nixon	Research Project	Trajectory design for Mars Bio-satellite	2003
Ryan Wold	Research Project (UMN)	Spacecraft Formation flying	2002
Jennifer Bonin	Research Project (UMN)	Distributed space systems control	2001

RESEARCH FUNDING

Sponsored Research

Funding Source	Title	Start/End Dates
NASA	Constrained Autonomous Spacecraft Landing (PI)	2016-2019
AFOSR	State-dependent Dynamic Networks: a System Theoretic Perspective (PI)	2016-2019
Boeing	Advanced Control Methods for Aircraft Flight Systems (PI)	2015-2019
DARPA	Breaking the Code: Engineering Neural Controllers and Behavior in Hydra (Co-PI)	2016-2020
NSF	Resilience Using Distributed Optimization and Natural Language Processing (Co-PI)	2015-2019
ARO/MURI	Predicting and controlling systems of interdependent networks (Co-PI)	2013-2018
ONR	Online Distributed Optimization (Co-PI)	2013-2018
FAA	Certification for Aeroservoelastic Active Control	2016-2018
DARPA	Data-guided Controllability: Learning from the Human Genome (Co-PI)	2015 (seedling for the main phase: 2016-2020/total budget: \$5M)
AFOSR	Network-centric Aspects of Human- Swarm Interaction (PI)	2012-2015
Boeing	Dynamic Load Management for Next Generation Aircraft Power Systems (PI)	2006-2013
NSF	Semi-Autonomous Networks: A System-Theoretic Perspective (PI)	2009-2012
AFOSR	Security and Robustness of Networked Systems: Random graphs, Algebraic graph theory and Control over Networks (PI)	2009-2012
NSF	A Network-centric Input-output and Robustness Analysis Framework for Distributed Systems (PI)	2005-2009
NIH (training grant)	Feedback in Physiological Regulatory Systems (Co-PI)	2007-2009
JPL	A Novel Approach to Adaptive Observers and Estimators for Multiple Spacecraft Formations (PI)	2007-2008
Murdock Foundation	Real-Time Data Acquisition System for Quantitative Visualization of Complex 3-D Phenomena (Co-PI)	2004-2008
NSF (CAREER)	Distributed Space Systems Control via Graph-Driven Hybrid Systems and Matrix Inequalities (PI)	2001-2006

Boeing	Deconfliction and Reconfiguration Strategies for Multiple-UAV Systems (PI)	2005-2007
Boeing	Reconfigurable Control Algorithms for Distributed Systems (PI)	2002-2005
JPL/NASA	Switching Control Laws for Constrained Formation Maneuvers (PI)	2002-2004
ONR	Stability and Control of Very High Speed Cavity-Running Bodies (Co-PI)	2002-2005
JPL	Reconfiguration algorithms for multiple S/C formation flying (PI)	2002-2003

Undergraduate and graduate courses taught at UW

- AA 310: Orbital & Spaceflight Mechanics (undergraduate orbital mechanics)
- AA/EE/ME 548: Multivariable Control (graduate-level course on LQR/LQG/H2)
- AA528: Spacecraft Dynamics and Control (graduate level course on spacecraft control and dynamic)
- AA/EE/ME 578: Optimization & Systems Sciences (graduate-level course on convex optimization and applications)
- AA/EE/ME 594: Robust Control (graduate-level course in matrix inequalities, H-infinity control)
- AA/EE/ME 510: Mathematical Foundations of System Theory (graduate level course on advanced linear algebra and operator theory with applications to systems and control theory)

Teaching Experience prior to 2002

- University of Minnesota-Twin Cities, Minneapolis, MN 1/00-5/02
Courses taught include Mechanics of Flight (AEM 2301; Spring 2000, Spring 2001, Spring 2002), Optimization and Systems Sciences (AEM8426; Fall 2001), and Modern Feedback Control (Fall 2002).
- California Institute of Technology, Pasadena, CA 9/98-6/99
Courses taught include Control of Physical Systems (CDS 110a and CDS 110b) and Advanced Topics in Control (CDS 270).
- University of Southern California, Los Angeles, CA 1/97-5/98
Course taught include Linear Algebra for Engineering (EE441; Fall 1997 and Spring 1998) and Applied Linear Algebra (Winter 1997).

SERVICE

Departmental Service Activities at UW

- Chair, Faculty Peer Review Committee 2014-present
- Member, Faculty Search Committee 2010-present
- Member, Space Allocation Committee 2014-2016
- Member, Undergraduate Committee 2012-present
- Chair, Faculty Search Committee 2013-2014

- Chair, Computer Committee 2006-2010
- Chair, Graduate Committee 2009-2012
- Member, Faculty Peer Review Committee 2005-2013
- Member, Diversity Committee 2008-present
- Member, Graduate Committee 2004-2009
- Member, Computer Committee 2003-2005

Departmental Service Activities at UMN

- AIAA Faculty Advisor 2000-2002

College and University Service Activities

- AA Chair Search Committee 2014
- EE Chair Search Committee 2007
- Faculty Fellows Program 2005-present
(a week long, full-time activity plus 10-15 hours of post/pre meetings and preparation)
- Distinguished Teaching Awards Committee 2005-2008
(25-30 hours in the span of one month)
- Distinguished Teaching Awardees Showcase 2009
(Sponsored by UWAA and UW Advancement Office)

Community service

Consulting

- Boeing Company, Everett, WA (2010-2013)
Providing consulting on flight control systems
- Scientific Systems, Inc., Woburn, MA (2009-2012)
Providing consulting on spacecraft formation flying algorithms

National or governmental service

- Review Panelist: NASA's Office of Space Science Research and Technology; United State Department of Agriculture Small Business Innovation; NSF CAREER Program; Air Force Office of Scientific Research, ARO, ONR

