

Vijay Kumar
Nemirovsky Family Dean
Department of Mechanical Engineering and Applied Mechanics
Secondary Appointments in Computer and Information Science and
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Education

B. Tech., Mechanical Engineering
Indian Institute of Technology, Kanpur, India, 1983

Ph.D., Mechanical Engineering
The Ohio State University, Columbus, Ohio, 1987

Professional Experience

- 2015- Dean, School of Engineering and Applied Science, University of Pennsylvania
- 2012-14 Assistant Director, Robotics and Cyber Physical Systems, Office of Science and Technology Policy, Executive Office of the President, Washington DC.
- 2008-12 Deputy Dean (Education), School of Engineering and Applied Science, University of Pennsylvania.
- 2005-08 Chairman, Department of Mechanical Engineering and Applied Mechanics, University of Pennsylvania.
- 2000-04 Deputy Dean (Research), School of Engineering and Applied Science, University of Pennsylvania.
- 1999 Visiting Professor, Johns Hopkins University, Baltimore, Maryland.
- 1998- Professor, Department of Mechanical Engineering and Applied Mechanics, University of Pennsylvania (secondary appointment in Computer and Information Science and the Department of Systems Engineering).
- 1998-05 Director, General Robotics Automation Sensing and Perception (GRASP) Laboratory.
- 1996 Visiting Scientist, Applied Science and Engineering Laboratories, Alfred I. DuPont Institute, Wilmington, Delaware.
- 1993-98 Associate Professor, Department of Mechanical Engineering and Applied Mechanics, University of Pennsylvania (secondary appointment in Computer and Information Science).
- 1987-93 Assistant Professor, Department of Mechanical Engineering and Applied Mechanics, University of Pennsylvania (with a secondary appointment in Computer and Information Science).
- 1983-87 Research Assistant and Research Fellow, The Ohio State University

Awards/Honors

- The Ohio State University Presidential Fellowship (1986)
- NSF Presidential Young Investigator Award (1991)
- Lindback Award for Distinguished Teaching, University of Pennsylvania (1996)
- The Ferdinand Freudenstein Award for significant contributions to mechanisms and robotics, National Conference on Mechanisms and Robotics (1997)
- Best paper award, Distributed Autonomous Robotic Systems (DARS), 2002.
- Fellow, American Society of Mechanical Engineers (2003)
- Kayamori Best Paper Award, IEEE Int. Conference on Robotics and Automation, 2005.
- IEEE Robotics and Automation Society Distinguished Lecturer (2005-09)
- Fellow, Institute for Electrical and Electronics Engineers (2005)
- Advisor to Best Student Paper Award, IEEE Int. Conference on Robotics and Automation, 2008.
- MSC Software Best Paper Award, ASME Int. Design Engineering Tech. Conferences, 2008.
- Advisor to Best Paper Award, Robotics Science and Systems, 2009.
- Association for Laboratory Automation Award, IEEE Int. Conference on Automation Science and Engineering, 2009.
- Advisor to Best Student Paper Award, Distributed Autonomous Robotic Systems, 2010.
- Best Paper Award, IEEE Int. Conference on Robotics and Automation, 2011.
- Best Paper Award, Robotics Science and Systems, 2011.
- Distinguished Service Award, IEEE Robotics and Automation Society Award, 2012.
- Mechanisms and Robotics Award, ASME Design Engineering Division, 2012.
- The Ohio State University Distinguished Alumnus Award, October 2012.
- World Technology Network Award, October 2012.
- George H. Heilmeier Faculty Award for Excellence in Research, University of Pennsylvania, 2013.
- Member, National Academy of Engineering, 2013.
- Best Paper Award, Robotics Science and Systems, 2013.
- Popular Mechanics Breakthrough Award, 2013
- Joseph Engelberger Award, Robotic Industries Association, 2014
- Best Paper Award for Automation, IEEE Int. Conference on Robotics and Automation, 2014.

Refereed Journal Publications

1. Kumar, R. V., Waldron, K.J. and Tsai, M.J., "Geometric Optimization of Serial Chain Manipulator Structures for Working Volume and Dexterity," *International Journal of Robotics Research*, Vol. 5, No. 2., 1986, pp. 91-103.
2. Pandy, M.G., Kumar, V., Berme, N., and Waldron, K.J., "The Dynamics of Quadrupedal Locomotion," *Journal of Biomechanical Engineering*, Vol. 110, No. 3, 1988, pp. 230-237.
3. Kumar, V. and Waldron, K.J., "Force Distribution in Closed Kinematic Chains," *IEEE Journal on Robotics and Automation*, Vol. 4, No. 6, December 1988, pp. 657-664.
4. Kumar, V. and Waldron, K.J., "Adaptive Gait Control for a Walking Robot," *Journal of Robotic Systems*, Vol. 6, No. 1. February 1989, pp. 49-75.
5. Kumar, V. and Waldron, K.J., "Actively Coordinated Mobility Systems," *ASME Journal of Mechanisms, Transmissions and Automation in Design*, Vol. 111, No. 2, 1989, pp. 223-231.
6. Kumar, V. and Waldron, K.J., "Suboptimal Algorithms for Force Distribution in Multifingered Grippers," *IEEE Journal on Robotics and Automation*, Vol. 5, No. 4, 1989, pp. 491-498.
7. Kumar, V. and Waldron, K.J., "Force Distribution in Walking Vehicles on Uneven Terrain," *ASME Journal of Mechanisms, Transmissions and Automation in Design*, Vol. 112, No. 1, 1990, pp. 90-99.

8. Kumar, V. and Gardner, J.F., "Kinematics of Redundantly Actuated Kinematic Chains," *IEEE Journal on Robotics and Automation*, Vol. 6, No. 13, 1990, pp. 269-273.
9. Kumar, V., "Instantaneous Kinematics of Parallel-Chain Robotic Mechanisms," *ASME Journal of Mechanisms, Transmissions, Automation in Design*, Vol. 114, No. 3, 1992, pp. 349-358.
10. Kim, J-H. and Kumar, V., "Robot Kinematics via Line Transformations," *Journal of Robotic Systems*, Vol. 7, No. 4, August 1990, pp. 649-674.
11. Yun, X. and Kumar, V., "An Approach to Simultaneous Control of Trajectory and Interaction Forces in Dual Arm Configurations," *IEEE Journal of Robotics and Automation*, Vol. 7, No. 5, October 1991, pp. 618-625.
12. Kumar, V., "Characterization of Workspaces of Parallel Manipulators," *ASME Journal of Mechanical Design*, Vol. 114, No. 3, 1992, pp. 368-375.
13. Kumar, V., "A Compact Inverse Velocity Solution for Redundant Robots," *Int. Journal of Robotics Research*, Vol. 12, No.1, February 1993, pp. 45-54.
14. Wang, Y. and Kumar, V., "Simulation of Mechanical Systems with Unilateral Constraints," *Journal of Mechanical Design*, June, 1994, pp. 571-580.
15. Ouerfelli, M. and Kumar, V., "Optimization of a 5-R Linkage," *ASME Journal of Mechanical Design*, Vol. 116, No. 1, March 1994, pp. 166-173.
16. Sarkar, N., Yun, X. and Kumar, V., "Control of Mechanical Systems with Rolling Contacts: Applications to Mobile Robots," *International Journal of Robotics Research*, Vol. 13, No. 1, February 1994: 55-69.
17. Pfreundschuh, G., Kumar, V. and Sugar, T.G., "Design and Control of a Three Degree of Freedom In-Parallel Actuated Manipulator," *Journal of Robotic Systems*, Vol. 11, No. 2, 1994, pp. 103-115.
18. Paljug, E., Yun, X., and Kumar, V., "Control of Rolling Contacts in Two-Arm Manipulation," *IEEE Transactions on Robotics and Automation*, *IEEE Journal of Robotics and Automation*, Vol. 10, No. 4, August 1994, pp. 441-452.
19. Chen, W. and Kumar, V., Workspaces of Mechanical Systems with Rolling Contacts, *Journal of Advanced Robotics*, The International Journal of the Robotics Society of Japan, Vol. 9, No. 5, 1995: 483-504.
20. Wang, C. C., and Kumar, V., "Kinematics and Control of Mobile Manipulators," *Journal of Applied Mechanisms and Robotics*, 1995, pp. 1-9.
21. Wellman, P., Krovi, V., Kumar, V. and Harwin, W. "A Wheelchair with Legs for People with Motor Disabilities," *IEEE Transactions on Rehabilitation Engineering*, Vol. 3, No. 4, 1995, pp. 343 - 53.
22. Kumar, V., Bajcsy, R., Harwin, W. and Harker, P., "Rapid Design and Prototyping of Customized Rehabilitation Aids," Special Section on Computers in Manufacturing, *Communications of the ACM*, Vol. 39, No. 2., February, 1996: 55-61.
23. Howard, W. S. and Kumar, V., "On the Stability of Grasped Objects¹," *IEEE Transactions on Robotics and Automation*, Vo. 12, No. 6, December 1996: 904-917.
24. Sarkar, N., Yun, X. and Kumar, V., "Control of Contact Interactions with Acatastatic Nonholonomic Constraints," *International Journal of Robotics Research*, Vol 16, No.3, June 1997: 357-374.

¹This paper was one of five nominations for the best paper award for the *IEEE Transactions on Robotics and Automation* in 1996.

25. Garvin, G. J., Zefran, M., Henis, E. A., and Kumar, V. "Two Arm Trajectory Planning in a Manipulation Task," *Journal of Biological Cybernetics*, Vol. 76, 1997: 53-62.
26. Sarkar, N. and Kumar, V., "Velocity and Acceleration Analysis of Contact between Three-Dimensional Rigid Bodies," *ASME Journal of Applied Mechanics*, Vol. 63, Dec. 1996: 974-984.
27. Adams, J., *et al.* "Cooperative Material Handling by Human and Robotic Agents: Module Development and System Synthesis," *Expert Systems with Applications*, Pergamon, Vol. 11, No. 2, 1996: 89-97.
28. Sarkar, N., Yun, X. and Kumar, V., "Dynamic Control of 3-D Rolling Contacts in Two-Arm Manipulation," *IEEE Transactions on Robotics and Automation*, Vol. 13, No. 3, pp. 364-376, 1997.
29. Howard, W. S., Zefran, M., and Kumar, V., "On the 6x6 Stiffness Matrix for Three-Dimensional Motions," *Journal of Mechanism and Machine Theory*, Vol. 33, No. 4, May 1998: 389-408.
30. Zefran, M., and Kumar, V., "Rigid Body Motion Interpolation," *Computer Aided Design*, Vol. 30, Issue 3, 1998: 179-189.
31. Zefran, M., Kumar, V. and Croke, C., "Generation of Smooth Three-Dimensional Rigid Body Motions," *IEEE Transactions on Robotics and Automation*, Vol. 14, No. 4, Aug 1998: 576-589.
32. Zefran, M., Kumar, V. and Croke, C., "Metrics and Connections for Rigid Body Kinematics," *International Journal of Robotics Research*, Vol. 18, No. 2, February 1999: 243-258.
33. Chen, C., and Kumar, V., "Motion Planning for Walking Vehicles Using Ordinal Optimization," *IEEE Robotics and Automation Magazine*, Vol. 5, No. 2, June 1998: 22-32.
34. Desai, J., Zefran, M., and Kumar, V., "Two Arm Manipulation with Friction-Assisted Grasping," *International Journal of Advanced Robotics*, Special Issue on "Selected Papers from IROS97".
35. Krovi, V., and Kumar, V., "Design and Control of a Hybrid Mobility System," *ASME Trans. Journal of Mechanical Design*, Vol. 121, No. 3, pp. 448-455, September 1999.
36. Krovi, V., Kumar, V., Ananthasuresh, G.K., and Vezien J-M., "Design and Virtual Prototyping of Rehabilitation Aids," *ASME Trans. Journal of Mechanical Design*, Vol. 121, No. 3, pp. 456-458, September 1999.
37. Ouerfelli, M., Kumar, V., and W. S. Harwin, "Kinematic Modeling of Head-Neck Movements", *IEEE Trans. Systems, Man, and Cybernetics*, Part A: Systems and Humans, Vol. 29, No. 6, 1999: 604-615.
38. Zefran, M., and Kumar, V., "A Geometrical Approach to the Study of the Cartesian Stiffness Matrix," *ASME Journal of Mechanical Design*, Vol. 124, No. 1, 2002: 30-38.
39. Desai, J., and Kumar, V., "Motion Planning of Nonholonomic Cooperating Mobile Manipulators," *Journal of Robotic Systems*, Vol. 16, No. 10, 1999: 557-579.
40. Kumar, V., Kinzel, G., Wei, S., Bengu, G., and Zhou, J. "Multi-University Design Projects," *ASEE Journal of Engineering Education*, Vol. 89, No. 3, 2000: 23-32.
41. Ostrowski, J., Desai, J., and Kumar, V., "Optimal Gait Selection for Nonholonomic Locomotion Systems," *International Journal of Robotics Research*, Vol. 19, No. 3, 2000: 1-13.
42. Chen, C., and Kumar, V., "Motion Planning for Walking Vehicles on Uneven Terrain," *Journal of Robotic Systems*, Vol. 16, No. 10, 1999: 527-545.

43. Song, P., Kraus, P., Kumar, V., and Dupont, P., "Analysis of Rigid Body Dynamic Models for Simulation of Systems with Frictional Contacts," *ASME Transactions Journal of Applied Mechanics*, V. 68, No. 1, pp. 118-128, Jan. 2001.
44. Wang, C. C., and Kumar, V., "The Performance of Repeatable Control Schemes for Redundant Robots," *Journal of Robotic Systems*, Vol. 18, No. 4, 2001.
45. Ouerfelli, M., Kumar, V., and Harwin, W.S. "Methods for kinematic modeling of biological and robotic systems," *Medical Engineering and Physics*, Elsevier Press, Vol. 22, 2000: 509-520.
46. V. Krovi, G. K. Ananthasuresh, and V. Kumar, "Kinematic Synthesis of Spatial R-R Dyads for Path Following With Applications to Coupled Serial Chain Mechanisms," *ASME Journal of Mechanical Design*, Vol. 123, No. 3, 2001: 359-366.
47. Ansar, A., Rodrigues, D., Desai, J., Daniilidis, K., Kumar, V. and Campos, M. Visual and Haptic Collaborative Tele-presence, *Computers & Graphics*, Special Issue on Mixed Realities Beyond Conventions, Vol. 25, No. 5, October 2001.
48. Desai, J., Ostrowski, J., and Kumar, V. "Modeling and Control of Formations of Nonholonomic Mobile Robots," *IEEE Transactions on Robotics and Automation*, Vol. 17(6), Dec. 2001: 905-908.
49. Sugar, T. and Kumar, V., Control of Cooperating Mobile Manipulators, *IEEE Transactions on Robotics and Automation*, Vol. 18, No. 1, February, 2002: 94-103.
50. T. G. Sugar and V. Kumar, "Metrics for Analysis and Optimization of Grasps and Fixtures," *International Journal of Robotics and Automation*, Vol. 17, Issue 1, 2002 (Special Issue on Compliance and Compliant Mechanisms): pp. 28-37.
51. T. G. Sugar and V. Kumar, "Design and Control of a Compliant Parallel Manipulator," *ASME Journal of Mechanical Design*, Vol. 124, No. 4, 2002: 676-683.
52. R. Alur, C. Belta, V. Kumar, M. Mintz, G. Pappas, H. Rubin, and J. Schug, Modeling and Analyzing Biomolecular Networks, *Computing in Science and Engineering*, Special Issue in Biocomputation, Jan/Feb. 2002: 20-31.
53. Belta, C. and Kumar, V., Euclidean metrics for motion generation on SE(3), *Journal of Mechanical Engineering Science Part C*, vol. 216, no. C1, pp. 47-61, 2002.
54. Belta, C. and Kumar, V., Computation of rigid body motion, *Electronic Journal of Computational Kinematics*, Vol 1, No. 1, <http://www-sop.inria.fr/coprin/EJCK/EJCK.html>.
55. Krovi, V., Ananthasuresh, G.K., and Kumar, V., "Kinematic and Kinetostatic Synthesis of Planar Coupled Multi-Link Serial Chain Mechanisms," *ASME Journal of Mechanical Design*, Vol. 24 (2), June 2002:143-155.
56. Belta, C. and Kumar, V. A SVD-Based Projection method for interpolation on SE(3), *IEEE Transactions on Robotics and Automation*, Vol. 18, No. 3, June 2002.
57. A. Das, R. Fierro, V. Kumar, J. Ostrowski, J. Spletzer, and C. J. Taylor, Vision Based Formation Control of Multiple Robots, Vol. 18, No. 5, *IEEE Transactions on Robotics and Automation*, October 2002: 813-825.
58. R. Fierro, A. Das, J. Spletzer, Y. Hur, R. Alur, J. Esposito, G. Grudic, V. Kumar, I. Lee, J. P. Ostrowski, G. Pappas, J. Southall and C. J. Taylor, "A framework and architecture for multirobot coordination," *International Journal of Robotics Research*, Vol. 21, No. 10-11, 2002: 977-995.

59. R. Alur, T. Dang, J. Esposito, Y. Hur, F. Ivancic, V. Kumar, I. Lee, P. Mishra, G. Pappas, and O. Sokolsky: Hierarchical Modeling and Analysis of Embedded Systems, *Proceedings of the IEEE*, (Volume 91, Number 1), January 2003.
60. Belta, C., and Kumar, V. "Motion generation for groups of robots," *ASME Journal of Mechanical Design*, Vol. 126, No. 1, January 2004.
61. Chaimowicz, L., Kumar, V. and Campos, F. M., "A Paradigm for Dynamic Coordination of Multiple Robots," *Autonomous Robots*, Volume 17, Issue 1, July 2004: Pages 7 – 21.
62. Tanner, H. G., Kumar, V. and G. J. Pappas, "Leader-to-Formation Stability," *IEEE Transactions on Robotics and Automation*, Vol. 20, No. 3, June, 2004.
63. P. Song, J.S. Pang, and V. Kumar, "A Semi-Implicit Time-Stepping Model for Frictional Compliant Contact Problems." *International Journal for Numerical Methods in Engineering*, Vol. 60, June 2004: 2231-2261.
64. J. Esposito and V. Kumar, "An Asynchronous Integration and Event Detection Algorithm for Simulating Multi-Agent Hybrid Systems," *ACM Transactions on Modeling and Computer Simulation*, Vol. 14, No. 4, October 2004: 336-358.
65. Belta, C., and Kumar, V. "Abstractions and Control Policies for a Swarm of Robots," *IEEE Transactions on Robotics*, vol.20, no.5, 2004: 865-875.
66. G. A. S. Pereira, V. Kumar, and M. F. M. Campos, "Decentralized Algorithms for Multirobot Manipulation via Caging," in *International Journal of Robotics Research*, 2004.
67. V. Kumar, D. Rus, and S. Singh, "Robot and Sensor Networks for First Responders," *IEEE Pervasive Computing*, October-December , 2004: pp 24-33.
68. Belta, C., Esposito, J. M., Kim, J, and Kumar, V., "Computational techniques for analysis of genetic network dynamics," *Int. Journal of Robotics Research*, Vol. 24, February – March, 2005: 219-229.
69. E. Stump and V. Kumar, "Workspaces of Cable-Actuated Parallel Manipulators," *ASME Journal of Mechanical Design*, Vol. 128, January, 2006.
70. Solomon, D., Kumar, V., Jenkins, R. A. and Jewell, J., "Head control strategies during whole-body turns," *Experimental Brain Research*, Vol. 173, No. 2, 2006.
71. Pang, J. S., Kumar, V., and Song, V., "Convergence of Time-Stepping Method for Initial and Boundary-Value Frictional Compliant Contact Problems," *SIAM J. Numerical Analysis*, Vol. 43, No. 5, 2006: 2200-2206.
72. Grocholsky, B., Keller, J., Kumar, V. and Pappas, G. "Cooperative Air-Ground Surveillance," *IEEE Robotics and Automation Magazine*, Vol. 13 (3), 2006: 16-25.
73. J.M. Esposito, and V. Kumar, "Event detection near singularities," *ACM Transactions on Modeling and Computer Simulation*, Volume 17, Issue 1, p. 1-22, January 2007.
74. Parikh, S., Grassi, V., and V. Kumar, "Integrating Human Inputs with Autonomous Behaviors on an Intelligent Wheelchair Platform," *IEEE Intelligent Systems: Special Issue on Interacting with Autonomy*," Vol. 22, No. 2, March/April 2007.
75. A. Halasz, V. Kumar, M. Imielinski, C. Belta, O. Sokolsky, S. Pathak and H. Rubin, "Analysis of Lactose Metabolism in *E.coli* using Reachability Analysis of Hybrid Systems," *IET Systems Biology*, Vol. 1, No. 2, 2007: 61-148.

76. M. A. Hsieh, A. Cowley, V. Kumar, and C.J. Taylor. "Maintaining Network Connectivity and Performance in Robot Teams," *Journal of Field Robotics*, Vol. 25, No. 1-2, 2008: 111-131.
77. M. A. Hsieh, L. Chaimowicz, A. Cowley, B. Grocholsky, J. F. Keller, V. Kumar, C. J. Taylor, Y. Endo, R. C. Arkin, B. Jung, D. F. Wolf, G. Sukhatme, and D. C. MacKenzie. "Adaptive teams of Autonomous Aerial and Ground Robots for Situational Awareness," *Journal of Field Robotics*, Vol. 24, No. 11-12, 2007: 991-1014.
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80. M. Ani Hsieh, Vijay Kumar and Luiz Chaimowicz, "Decentralized controllers for shape generation with robotic swarms," *Robotica*, Vol. 26, No. 5, September 2008: 691-701.
81. N. Michael, J. Fink, and V. Kumar, "Controlling Ensembles of Robots via a Supervisory Aerial Robot," *Advanced Robotics*, Vol. 22, 2008:1361-1377.
82. P. Cheng and V. Kumar, "Sampling-based falsification and verification of controllers for continuous dynamic systems," *Int. Journal Robotics Research*, Vol. 27, No. 11-12, Nov/Dec 2008: 1232-1245.
83. M. Ani Hsieh, Ádám Halász, Spring Berman and Vijay Kumar, "Biologically inspired redistribution of a swarm of robots among multiple sites," *Swarm Intelligence*, Vol. 2, No. 2-4, December, 2008.
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88. N. Michael and V. Kumar, "Planning and control of ensembles of robots with nonholonomic constraints," *International Journal of Robotics Research* 28(8), Aug. 2009:962-975.
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95. N. Michael, J. Fink and V. Kumar. Cooperative manipulation and transportation with aerial robots. *Autonomous Robots*. Vol. 30, No. 1, 2011.
96. E. B. Steager, M. S. Sakar, D. H. Kim, V. Kumar, G. Pappas, M. J. Kim. Electrokinetic and optical control of bacterial microrobots. *J. Micromechanics and Microengineering*. Vol. 21, 2011.
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99. V. Kallem, A. T. Komoroski, and V. Kumar, "Sequential Composition for Navigating a Nonholonomic System in the Presence of Obstacles," *IEEE Transactions on Robotics*, Vol. 27, No. 6, 2011.
100. S. Berman, Q. Lindsey, M. S. Sakar, V. Kumar and S. C. Pratt, "Experimental study and modeling of group retrieval and approaches to collective transport in swarm robotic systems," *Proceedings of the IEEE*, Vol. 99, No. 9, Sept. 2011.
101. N. Michael and V. Kumar, "Control of Ensembles of Aerial Robots," *Proceedings of the IEEE*, Vol. 99, No. 9, Sept. 2011.
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103. J. Fink, A. Ribeiro, and V. Kumar, "Robust Cyber-Physical Control of Mobility and Communications in Autonomous Robot Teams," *Proceedings of the IEEE*, 100(1):164-178, January 2012.
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108. Quentin Lindsey, Daniel Mellinger and Vijay Kumar, "Construction with quadrotor teams," *Autonomous Robots*, 33, (3), 2012.
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111. S. Shen, N. Michael, and V. Kumar, "Stochastic differential equation-based exploration algorithm for autonomous indoor 3D exploration with a micro-aerial vehicle," *Intl. J. Robot. Research*, Vol. 31, No. 12, pp. 1431-1444, 2012.
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113. V. Kumar and N. Michael, "Opportunities and Challenges with Micro Aerial Vehicles," *Int. Journal on Robotics Research*, Vol. 31, No. 11, 2012.
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116. S. Shen, N. Michael and V. Kumar, "Autonomous navigation in confined indoor environments with a micro-aerial vehicle," *IEEE Robotics and Automation Magazine*, 2013.
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328. Soonkyum Kim, Subhrajit Bhattacharya and Vijay Kumar, "Path Planning for a Tethered Mobile Robot," *Proceedings of IEEE International Conference on Robotics and Automation (ICRA)*, 2014.
329. Shaojie Shen, Yash Mulgaonkar, Nathan Michael and Vijay Kumar, "Multi-Sensor Fusion for Robust Autonomous Flight in Indoor and Outdoor Environments with a Rotorcraft MAV," *Proceedings of IEEE International Conference on Robotics and Automation (ICRA)*, 2014.
330. Justin Thomas, Guiseppa Loianno, Koushil Sreenath and Vijay Kumar, "Toward Image Based Visual Servoing for Aerial Grasping and Perching," *Proceedings of IEEE International Conference on Robotics and Automation (ICRA)*, 2014.
331. Kartik Mohta, Kostas Daniilidis and Vijay Kumar, "Vision-based Control of a Quadrotor for Perching on Lines," *Proceedings of IEEE International Conference on Robotics and Automation (ICRA)*, 2014.

332. Edward B. Steager, Denise Wong, Deepak Mishra, Ron Weiss and Vijay Kumar, "Sensors for Micro Bio Robots via Synthetic Biology," *Proceedings of IEEE International Conference on Robotics and Automation (ICRA)*, 2014.
333. D. Panagou, M. Turpin, and V. Kumar, "Decentralized Goal Assignment and Trajectory Generation in Multi-Robot Networks: A Multiple Lyapunov Functions Approach," in *Proc. of the 2014 IEEE Int. Conf. on Robotics and Automation*, Hong Kong, China, June 2014.
334. Yash Mulgaonkar and Vijay Kumar Autonomous, Charging to enable long-endurance missions for small aerial robots, *Proceedings of the 2014 SPIE Defense and Security Symposium*, Baltimore, MD, May 2014.
335. Yash Mulgaonkar, Michael Whitzer, Brian Morgan, Christopher M. Kroninger, Aaron M. Harrington, Vijay Kumar, Power and weight considerations in small, agile quadrotors, in *Micro- and Nanotechnology Sensors, Systems, and Applications VI*, Thomas George; M. Saif Islam; Achyut K. Dutta, Editors, *Proceedings of SPIE Vol. 9083*, May 2014.
336. J. Keller, D. Thakur, V. Dobrokhodov, K. Jones, M. Likhachev, J. Gallier, I. Kaminer, and V. Kumar, "Coordinated commencement of pre-planned routes for fixed-wing UAS starting from arbitrary locations - a near real-time solution," in *Unmanned Aircraft Systems (ICUAS), 2014 International Conference on*, Orlando FL, May 2014, pp.552,561, 27-30.
337. M. Saska, J. Chudoba, L. Precil, J. Thomas, G. Loianno, A. Tresnak, V. Vonasek, and V. Kumar, "Autonomous deployment of swarms of micro-aerial vehicles in cooperative surveillance," in *2014 International Conference on Unmanned Aircraft Systems (ICUAS)*, Orlando FL, May 2014, pp. 584–595.
338. M. Saska, J. Chudoba, L. Precil, J. Thomas, G. Loianno, and V. Kumar, "Plume Tracking by a Self-Stabilized Group of Micro Aerial Vehicles," in *Modelling and Simulation for Autonomous System Workshop*, Rome, Italy, May 2014.
339. A.Mehta, N. Bezzo, B. An, P. Gebhard, V. Kumar, I. Lee, and D. Rus, "A Design Environment for the Rapid Specification and Fabrication of Printable Robots," in *14th International Symposium on Experimental Robotics*, Marrakech, Morocco, June 2014.
340. Kartik Mohta, Matthew Turpin, Alex Kushleyev, Daniel Mellinger, Nathan Michael, and Vijay Kumar, "QuadCloud: A Rapid Response Force with Quadrotor Teams," *International Symposium on Experimental Robotics (ISER)*, Morocco, 2014.
341. S. Liu, K. Mohta, S. Shen, and V. Kumar, "Towards collaborative mapping and exploration using multiple micro aerial robots," *International Symposium on Experimental Robotics (ISER)*, Morocco, 2014.
342. S. Shen, Y. Mulgaonkar, N. Michael, and V. Kumar, "Initialization-free monocular visual-inertial estimation with application to autonomous MAVs," *International Symposium on Experimental Robotics (ISER)*, Morocco, 2014.
343. R. Tron, J. Thomas, G. Loianno, J. Polin, V. Kumar, and K. Daniilidis, "Vision-based Formation Control of Aerial Vehicles", in *Robotics Science and Systems (RSS), Distributed Control and Estimation for Robotic Vehicle Networks*, Berkeley, USA, July 2014.
344. R. Hayward, M. Eckert, J. Thomas, M. Whitzer, S. Chaudhuri, T. Fitzsimons, D. Hsu, M. Yim, and V. Kumar, "The Y-Prize Competition: An Inverted X-Prize Competition for Commercializing University Research," in *International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (IDETC/CIE)*, Buffalo NY, August 2014.

345. Benjamin Charrow, Nathan Michael and Vijay Kumar, "Active control strategies for discovering and localizing devices with range-only sensors," Workshop on Algorithmic Foundations in Robotics (WAFR), August 2014.
346. Matthew Turpin, Nathan Michael and Vijay Kumar, "An Approximation Algorithm for Time Optimal Multi-Robot Routing," Workshop on Algorithmic Foundations in Robotics (WAFR), August 2014.
347. Indranil Saha, Rattanachai Ramaithitima, Vijay Kumar, George J. Pappas, and Sanjit A. Seshia. Automated Composition of Motion Primitives for Multi-Robot Systems from Safe LTL Specifications. *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, September 2014.
348. J. Stephan, J. Fink, B. Charrow, A. Ribeiro and V. Kumar, Robust routing and multi-confirmation transmission protocol for connectivity management of mobile robotic teams, *Int. Conf. Intelligent Robots Systems*, Chicago, September 2014.
349. C. Rizzo, V. Kumar, F. Lera, and J. L. Villarroel, RF odometry for localization in pipes based on periodic signal fadings, *Int. Conf. Intelligent Robots Systems*, Chicago, September 2014.
350. V. Govindarajan, S. Bhattacharya and V. Kumar, "Human-Robot Collaborative Topological Exploration for Search and Rescue Applications," in *International Symposium on Distributed Autonomous Robotic Systems (DARS)*, Korea, November 2014.
351. S. Tang and V. Kumar, "Mixed Integer Quadratic Program Trajectory Generation for a Quadrotor with a Cable-Suspended Payload," in *IEEE International Conference on Robotics and Automation*, May 2015.
352. B. Charrow, S. Liu, V. Kumar, and N. Michael, "Information-Theoretic Mapping Using Cauchy-Schwarz Quadratic Mutual Information," in *IEEE International Conference on Robotics and Automation (ICRA)*, Seattle WA, May 2015.
353. R. Ramaithitima, M. Whitzer, S. Bhattacharya, and V. Kumar, "Sensor coverage robot swarms using local sensing without metric information," in *IEEE International Conference on Robotics and Automation (ICRA)*, Seattle WA, May 2015, pp. 3408-3415.
354. E. Steager, D. Wong, N. Chodosh and V. Kumar, "Optically addressing microscopic bioactuators for real-time control," in *IEEE International Conference on Robotics and Automation (ICRA)*, Seattle WA, May 2015.
355. G. Loianno, J. Thomas and V. Kumar, "Cooperative Localization and Mapping of MAVs using RGB-D Sensors," in *IEEE International Conference on Robotics and Automation (ICRA)*, Seattle WA, May 2015.
356. Y. Mulgaonkar, G. Cross and V. Kumar, "Design of small, safe and robust quadrotor swarms," in *IEEE International Conference on Robotics and Automation (ICRA)*, Seattle WA, May 2015.
357. H. Carrillo, P. Dames, V. Kumar, and J. Castellanos, "Autonomous Robotic Exploration Using Occupancy Grid Maps and Graph SLAM Based on Shannon and Rényi Entropy," in *2015 IEEE International Conference on Robotics and Automation*, May 2015.
358. B. Charrow, G. Kahn, S. Patil, S. Liu, K. Goldberg, P. Abbeel, N. Michael, and V. Kumar, "Information-Theoretic Planning with Trajectory Optimization for Dense 3D Mapping," in *Proceedings of the Robotics: Science and System (RSS)*, Rome, Italy, July 2015.
359. D. Wong, J. Wang, E. Steager and V. Kumar, "Control of Multiple Magnetic Micro Robots," in *International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (IDETC/CIE)*, Boston MA, August 2015.

360. Y. Mulgaonkar, T. Kientz, M. Whitzer and V. Kumar, "Design and Fabrication of Safe, Light-Weight, Flying Robots," in *International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (IDETC/CIE)*, Boston MA, August 2015.
361. J. Thomas, G. Loianno, M. Pope, E. W. Hawkes, M. A. Estrada, H. Jiang, M. R. Cutkosky, and V. Kumar, "Planning and Control of Aggressive Maneuvers for Perching on Inclined and Vertical Surfaces," in *International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (IDETC/CIE)*, Boston MA, August 2015.
362. M. D. Kennedy III, L. Guerrero and V. Kumar, "Decentralized Algorithm for Force Distribution with Applications to Cooperative Transport," in *International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (IDETC/CIE)*, Boston MA, August 2015.
363. J. Das, G. Cross, C. Qu, A. Makineni, P. Tokekar, Y. Mulgaonkar and V. Kumar, "Devices, Systems, and Methods for Automated Monitoring enabling Precision Agriculture," in *Automation Science and Engineering (CASE), 2015 IEEE International Conference on*, Gothenburg, Sweden, August 2015, vol., no., pp.462-469, 24-28.
364. J. Cleveland, D. Thakur, P. Dames, C. Phillips, T. Kientz, K. Daniilidis, J. Bergstrom, and V. Kumar, "An Automated System for Semantic Object Labeling with Soft Object Recognition and Dynamic Programming Segmentation," in *2015 IEEE International Conference on Automation Science and Engineering*, Aug 2015.
365. P. Dames, P. Tokekar, and V. Kumar. "Detecting, Localizing, and Tracking an Unknown Number of Moving Targets Using a Team of Mobile Robots," in *International Symposium on Robotics Research (ISRR)*, Sestri Levante, Italy, September 2015.
366. S. Tang and V. Kumar, "A Complete Algorithm for Generating Safe Trajectories for Multi-Robot Teams," in *International Symposium on Robotics Research (ISRR)*, Sestri Levante, Italy, September 2015.
367. M. Watterson and V. Kumar, "Safe receding horizon control for aggressive mav flight with limited range sensing," in *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Hamburg, Germany, September 2015.
368. G. Loianno, Y. Mulgaonkar, C. Brunner, D. Ahuja, A. Ramanandan, M. Chari, S. Diaz, and V. Kumar, "Smartphones Power Flying Robots," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Hamburg, Germany, September 2015.
369. S. Pequito, J. Svacha, G. Pappas and V. Kumar, "Sparsest Minimum Multiple-Cost Structural Leader Selection," in *5th IFAC Workshop on Distributed Estimation and Control in Networked Systems (NecSys)*, Philadelphia PA, September 2015.
370. J. Keller, D. Thakur, M. Likhachev, J. Gallier and V. Kumar, "Coordinated Path Planning for Fixed-wing UAS Conducting Persistent Surveillance Missions," in *2015 IEEE International Symposium on Safety, Security, and Rescue Robotics (SSRR)*, West Lafayette IN, October 2015.
371. A. Prorok, M. Ani Hsieh and V. Kumar, "Fast Redistribution of a Swarm of Heterogeneous Robots¹⁸," in *International Conference on Bio-inspired Information and Communications Technologies*, New York NY, December 2015.
372. A. Concha, G. Loianno, V. Kumar, and J. Civera, "Visual-inertial direct SLAM," in *2016 IEEE International Conference on Robotics and Automation (ICRA)*, 2016, pp. 1331–1338.

¹⁸ Winner of the Best Paper Award, BICT 2015.

373. J. Das, G. Cross, C. Qu, A. Makineni, P. Tokekar, Y. Mulgaonkar, and V. Kumar, "Devices, systems, and methods for automated monitoring enabling precision agriculture," in *2015 IEEE International Conference on Automation Science and Engineering (CASE)*, 2015, pp. 462–469.
374. E. E. Hunter, N. Chodosh, E. B. Steager, and V. Kumar, "Control of microstructures propelled via bacterial baths," in *2016 IEEE International Conference on Robotics and Automation (ICRA)*, 2016, pp. 1693–1700.
375. J. Keller, D. Thakur, J. Gallier, and V. Kumar, "Obstacle avoidance and path intersection validation for UAS: A B-spline approach," in *2016 International Conference on Unmanned Aircraft Systems (ICUAS)*, 2016, pp. 420–429.
376. C. C. Kessens, J. Thomas, J. P. Desai, and V. Kumar, "Versatile Aerial Grasping Using Self-Sealing Suction," in *IEEE International Conference on Robotics and Automation*, Stockholm, 2016.
377. S. Liu, M. Watterson, S. Tang, and V. Kumar, "High speed navigation for quadrotors with limited onboard sensing," in *2016 IEEE International Conference on Robotics and Automation (ICRA)*, 2016, pp. 1484–1491.
378. G. Loianno, Y. Mulgaonkar, C. Brunner, D. Ahuja, A. Ramanandan, M. Chari, S. Diaz, and V. Kumar, "A Swarm of Flying Smartphones," in *Intelligent Robots and Systems (IROS), 2016 IEEE/RSJ International Conference on*, 2016.
379. Y. Mulgaonkar, B. Araki, J. s Koh, L. Guerrero-Bonilla, D. M. Aukes, A. Makineni, M. T. Tolley, D. Rus, R. J. Wood, and V. Kumar, "The flying monkey: A mesoscale robot that can run, fly, and grasp," in *2016 IEEE International Conference on Robotics and Automation (ICRA)*, 2016, pp. 4672–4679.
380. M. Whitzer, J. Keller, S. Bhattacharya, V. Kumar, T. Sands, L. Ritholtz, A. Pope, D. Dickmann, "In-Flight Formation Control for a Team of Fixed-Wing Aerial Vehicles," presented at the 2016 International Conference on Unmanned Aircraft Systems (ICUAS), Arlington, VA, 2016.
381. A. Prorok, M. A. Hsieh, and V. Kumar, "Formalizing the impact of diversity on performance in a heterogeneous swarm of robots," in *2016 IEEE International Conference on Robotics and Automation (ICRA)*, 2016, pp. 5364–5371.
382. J. Seo, M. Yim, and V. Kumar, "Assembly sequence planning for constructing planar structures with rectangular modules," in *2016 IEEE International Conference on Robotics and Automation (ICRA)*, 2016, pp. 5477–5482.
383. S. Sarkar, J. Das, R. Ehsani, V. Kumar, "Towards autonomous phytopathology: Outcomes and challenges of citrus greening disease detection through close-range remote sensing," presented at the 2016 IEEE International Conference on Robotics and Automation (ICRA), Stockholm, Sweden, 2016, pp. 5143–5148.
384. J. Stephan, J. Fink, V. Kumar, and A. Ribeiro, "Hybrid architecture for communication-aware multi-robot systems," in *2016 IEEE International Conference on Robotics and Automation (ICRA)*, 2016, pp. 5269–5276.
385. J. Thomas, G. Loianno, K. Daniilidis, and V. Kumar, "The role of vision in perching and grasping for MAVs," in *SPIE 9836, Micro- and Nanotechnology Sensors, Systems, and Applications VIII*, 2016, vol. 9836, p. 98361S.

Keynote Lectures and Seminars

1. School of Engineering, *Dartmouth College*, Hanover, New Hampshire, February, 1987.
2. Department of Mechanical Engineering, *University of Pittsburgh*, Pittsburgh, February, 1987.
3. Department of Mechanical Engineering and Applied Mechanics, University of Pennsylvania, March 1987.
4. Department of Mechanical Engineering, *University of Michigan*, Ann Arbor, April, 1987.
5. Department of Mechanical Engineering, *University of California*, Irvine, November, 1990.
6. Department of Mechanical Engineering, *University of Duisburg*, Duisburg, Germany, December 1990.
7. Department of Mechanical Engineering, *Darmstadt Technische Hochschule*, Darmstadt, Germany, December 1990.
8. Department of Mechanical Engineering, *University of Stuttgart*, Stuttgart, Germany, December 1990.
9. Department of Mechanical Engineering, *Pennsylvania State University*, State College, February 1991.
10. Department of Mechanical Engineering, *Villanova University*, Villanova, March 1991.
11. *Oakridge National Laboratory*, Oakridge, Tennessee, August 1991.
12. Department of Mechanical Engineering, *John Hopkins University*, December 1992.
13. *Applied Science and Engineering Laboratories*, University of Delaware, April 1993.
14. Department of Mechanical Engineering, *University of Maryland*, December 1993.
15. Department of Mechanical Engineering, *University of Toronto*, August 1994.
16. Department of Mechanical Engineering, *John Hopkins University*, November 1994.
17. Department of Mechanical Engineering, *State University of New York, Stonybrook*, March, 1996.
18. Department of Physical Therapy, *University of Delaware*, February 1996.
19. Department of Mechanical Engineering, *University of Delaware*, October 1996.
20. Department of Mechanical Engineering, *Katholik University*, December 1996.
21. Division of Applied Science, *Harvard University*, January 1997.
22. Department of Computer Science, *Federal University of Minas Gerais*, Belo Horizonte, Brazil, June 1997.
23. Department of Mechanical Engineering, *Drexel University*, Philadelphia, February 1998.
24. Department of Mathematics, *University of Pennsylvania*, Philadelphia, November 1998.
25. Department of Mechanical Engineering, *Rutgers Univeristy*, New Jersey, March 1999.

26. Department of Mechanical Engineering, *Arizona State University*, Tempe, Arizona, October 1999.
27. Department of Mechanical Engineering, *Johns Hopkins University*, Baltimore, Maryland, November 1999.
28. Keynote Lecture, *National Conference on Mechanisms and Machines*, Bombay, India, 1999.
29. *NSF CISE Distinguished Lecture*, Arlington, VA, June 13, 2000.
30. Department of Mechanical Engineering, *McGill University*, Montreal, Canada, November, 2000.
31. Robotics Institute Seminar, *Carnegie Mellon University*, February, 2001.
32. Department of Computer Science, *Yale University*, February 8, 2002.
33. Department of Mechanical Engineering, *Drexel University*, October 4, 2002.
34. Workshop on Intelligent Human Augmentation and Virtual Environments, *University of North Carolina*, Chapel Hill, October 17-19, 2002.
35. *Intel Corporation*, Portland, Oregon, January 2003.
36. Department of Mechanical Engineering, *Johns Hopkins University*, Baltimore, January 2003.
37. Institute for Systems Research, *University of Maryland*, February 2003.
38. *Coordinated Science Laboratory*, *University of Illinois*, Urbana-Champaign, March 2003.
39. Department of Mechanical Engineering, *Tokyo Institute of Technology*, Japan, July, 2003.
40. Department of Mechanical Engineering, Boston University, January , 2004.
41. Department of Computer Science, University of Southern California, February, 2004.
42. Jet Propulsion Laboratory, Los Angeles, February, 2004.
43. Engineering in Medicine, National Academy of Engineering Mid-Atlantic Symposium, 2004.
44. Thomas Jefferson University, December, 2004.
45. Air Force Research Laboratory, Space Vehicles Directorate, Kirtland Airforce Base, Albuquerque, New Mexico, May, 2005
46. Department of Mechanical Engineering, University of New Mexico, Albuquerque, May 2005.
47. Public lecture, NASA, Goddard, July 2005.
48. Department of Electrical and Computer Engineering, University of Toronto, September 2005.
49. Robotics Institute, Carnegie Mellon University, February, 2006.
50. Keynote, International Advanced Robotics Program Planning Forum, Orlando, Florida, May 14, 2006.
51. Department of Mechanical Engineering, State University of New York, Buffalo, August 2006.
52. Keynote lecture, 28th International Congress of Electronics Engineers, Institute of Technology, Chihuahua, Mexico, October 2006.

53. Robotics and Intelligent Machines Seminar Series, Georgia Institute of Technology, November 2006.
54. U.S. Military Academy, West Point, February, 2007
55. City College of New York, February, 2007.
56. Keynote Lecture, Foundations of Nanoscale Science: Self-Assembled Architectures and Devices, March, 2007.
57. Department of Mechanical Science and Engineering, University of Illinois, Urbana Champaign, April 2007.
58. Department of Mechanical Engineering, Massachusetts Institute of Technology, May 2007.
59. Keynote Lecture, International Symposium on Assembly and Manufacturing, Ann Arbor, Michigan, July 2007.
60. Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland, September 2007.
61. Department of Computer Science, Robotics Day, Rennselaer Polytechnic Institute, October 2007.
62. Department of Computer Science, University of Southern California, December 2007.
63. Department of Mechanical Engineering, Nanyang Technological University (NTU), Singapore, December 2007.
64. Department of Electrical Engineering, Polytechnic University, New York, January 2008.
65. Department of Mechanical Engineering, University of California, Santa Barbara, March 2008.
66. Plenary Lecture, IEEE Conference on Automation Science and Engineering, Washington DC, August 2008.
67. Controls Seminar, University of Michigan, Ann Arbor, September 2008.
68. Workshop on Cyber-Physical Systems, International Conference on Robots and Systems (IROS 2008), Nice, France, 2008.
69. Invited Speaker, Robotics and Automation Symposium, University of Tokyo, 2008.
70. Department of Mechanical and Aerospace Engineering, Princeton University, Princeton, February 2009.
71. Keynote Lecture, International Conference on Robot Communication and Coordination, *Robocomm* 2009, Odense, Denmark, April 2009.
72. Department of Mechanical Engineering, Rice University, Houston, April 2009.
73. Distinguished Lecture, IEEE Washington Chapter, McLean, VA, April 2009.
74. Intelligent Systems Division, Manufacturing Engineering Laboratory, National Institute of Standards and Technology, Gaithersburg, MD, April 2009.
75. Booze Allen Hamilton Distinguished Lecturer, Department of Electrical and Computer Engineering, University of Maryland, September 25, 2009.

76. Department of Mechanical Engineering, Carnegie Mellon University, Pittsburgh, October 30, 2010.
77. Center for Information and Systems Engineering, Boston University, January 2010.
78. Keynote, Mechanisms and Robotics, ASME International Design Engineering Technical Conferences, Montreal, Canada, August 16, 2010.
79. Institute of Pure and Applied Mathematics, University of California, Los Angeles, October 18, 2010.
80. Science and Technology Innovators Lecture, University of Minnesota, Minneapolis, November 9, 2010.
81. Department of Mechanical Engineering, Shanghai Jiaotong University, Shanghai, China, December 14, 2010.
82. Department of Mechanical Engineering, Indian Institute of Technology, New Delhi, December 22, 2010.
83. Department of Electrical Engineering and Computer Science, University of California, Berkeley, February 11, 2011.
84. Institute of Systems Research, University of Maryland, College Park, MD, February 25, 2011.
85. Institute for System Research, Instituto Superior Tecnico, Lisbon, Portugal, April 7, 2011.
86. Department of Mechanical Engineering and Applied Mechanics, University of Texas, Austin, April 12, 2011.
87. Keynote, Austrian Robotics Workshop, Tirol, Austria, May 23, 2011.
88. Keynote, Congreso Internacional De Ingenieria Electrica, Electronica, Sistemas Y Ramas Afines, Lima, Peru, August 8, 2011.
89. Plenary, Frontiers of Real-World Multi-Robot Systems: Challenges and Opportunities, Duke University, Durham, NC, October 10, 2011.
90. Department of Mechanical Engineering, Yale University, Nov. 2, 2011.
91. TCS Excellence in Computer Science (TECS) Week, Pune, Jan 9-13, 2012.
92. International Conference on Unmanned Autonomous Vehicles (ICUAV), Bangalore, Feb 24, 2012.
93. 2012 TED (Technology Entertainment and Design) Talk, Long Beach, CA, Feb 29, 2012.
94. Department of Electrical and Computer Engineering, University of Florida, March 15, 2012.
95. Department of Mechanical Engineering, University of South Florida, March 16, 2012.
96. Department of Mechanical Engineering, University of Delaware, April 20, 2012.
97. Northwestern Institute of Complex Systems, Northwestern University, April 25, 2012.
98. Keynote, Field and Service Robotics, Matsushita, Japan, July 17, 2012.
99. Keynote, Global Conference on Educational Robotics, Honolulu, Hawaii, July 20, 2012.
100. Keynote, International Conference on Swarm Intelligence, Brussels, September 13, 2012.

101. Banquet Speaker, 2012 Institute for Translational Medicine and Therapeutics Symposium on Systems Pharmacology and Translational Medicine, October 16, 2012.
102. Keynote Speaker, AAAI Symposium on Human Control of Bio-Inspired Swarms, November 2, 2012.
103. Department of Mechanical Engineering, Purdue University, November 15, 2012.
104. Department of Electrical Engineering and Computer Science, University of California, Berkeley, November 29, 2012.
105. Keynote Speaker, IEEE International Conference on Robotics and Biomimetics (ROBIO 2012), December 12, 2012.
106. TEDx Singapore, Singapore, December 10, 2012.
107. Department of Mechanical Engineering, Seoul National University, December 14, 2012.
108. Rajiv Gandhi Institute for Contemporary Studies, December 17, 2012.
109. TEDx CIA, Washington DC, January 16, 2013.
110. Keynote Speaker, Solid Works World, January 22, 2013.
111. Department of Computer Science, University of Washington, February 19, 2013.
112. Department of Mechanical Engineering, Boston University, March 1, 2013.
113. Department of Computer Science, University of North Carolina, Charlotte, March 21, 2013.
114. Keynote Speaker, United Technologies Fellows Forum, Hartford, April 3, 2013.
115. Robert Chien Distinguished Lecture, Coordinated Sciences Laboratory, University of Illinois, Urbana Champaign, April 9, 2013.
116. Keynote Speaker, Cyber Physical Systems Week, Philadelphia, April 10, 2013.
117. Invited Speaker, Next Generation Robotics, University of Michigan, May 20, 2013.
118. Keynote Speaker, Qualcomm Technical Forum, San Diego, June 5, 2013.
119. Seminar, NEC Laboratories, Princeton, June 13, 2013.
120. Keynote Speaker, 27th Annual Conference on Artificial Intelligence, American Association for Artificial Intelligence, Seattle, July 17, 2013.
121. Invited Speaker, Industrial Design Society of America, Chicago, August 22, 2013.
122. Lecture, Philosophical Society, Washington DC, Cosmos Club, September 6, 2013.
123. Keynote Speaker, Drones and Aerial Robotics Conference, New York, October 11, 2013.
124. Invited Speaker, DIGST Global Innovation Festival, Daegu, South Korea, November 21, 2013.
125. Stanford S. and Beverly P. Penner Distinguished Lecturer, Department of Mechanical and Aerospace Engineering, University of California, San Diego, January 13, 2014.

126. Keynote Speaker, Northrop Grumman 2014 NGENUITY Leadership Conference, Redondo Beach, California, January 21, 2014.
127. Seminar, MIT Lincoln Laboratory, February 4, 2014.
128. Seminar, Arizona State University, February 13, 2014.
129. Institute of Advanced Studies Distinguished Lecture, The Hong Kong University of Science and Technology, Hong Kong, February 26, 2014.
130. Seminar, Department of Engineering Design, Indian Institute of Technology, Madras, March 3, 2014.
131. Mechanical Engineering Colloquium, MIT, March 14, 2014.
132. Seminar, Department of Computer Science, Columbia University, April 9, 2014.
133. Seminar, Department of Computer Science, Syracuse University, April 23, 2014.
134. Seminar, Georgia Institute of Technology, Atlanta, April 30, 2014.
135. MnDRIVE workshop, "Future Directions in Robotics," University of Minnesota, April 17, 2014.
136. Keynote Address, Unmanned Systems 2014, Association of Unmanned Vehicle Systems International (AUVSI), May 15, 2014.
137. Keynote Address, International Symposium on Robots (ISR), Munich, Germany, June 3, 2014.
138. Keynote Address, 2nd International workshop on Multi-Unmanned Vehicle Systems, Compiègne, France, June 30, 2014.
139. Plenary, Workshop on "Next-Generation Robotics: Academia, Start-ups and Industry," *Robotics Science and Systems*, Berkeley, CA, July 13, 2014.
140. Seminar, University of Michigan, July 10, 2014.
141. Plenary Speaker, *Chinese Control Conference*, Nanjing, July 27, 2014.
142. Keynote Speaker, *Workshop on Algorithmic Foundations in Robotics (WAFR)*, Istanbul, Turkey, August 3, 2014.
143. Keynote Speaker, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Chicago, September 16, 2014.
144. Plenary Speaker, *IEEE Multi Systems Conference on Systems and Control*, Antibes, France, 2014.
145. Seminar, University of Wisconsin, Lacrosse, October 20, 2014.
146. TEDx Gateway, Mumbai, November 2, 2014.
147. Seminar, Indian Institute of Technology, Kanpur, November 4, 2014.
148. Keynote, NSF Cyber Physical Systems PI meeting, November 7, 2014.
149. William C. Reynolds Memorial Seminar, Department of Mechanical Engineering, Stanford University, Jan 22, 2015.
150. Keynote Speaker, UAE Drones for Good, Dubai, Feb 8, 2015.

151. South West Mechanics Lecture Series Speaker, University of Oklahoma, February 26, 2015.
152. South West Mechanics Lecture Series Speaker, Oklahoma State University, February 27, 2015.
153. Max Planck Lecture, Max Planck Institute for Intelligent Systems, March 9, 2015.
154. Invited Speaker, National Academic of Engineering Regional Meeting, Texas A&M University, March 31, 2015.
155. South West Mechanics Lecture Series Speaker, University of Texas, Austin, April 1, 2015.
156. The Future of Flying Robots, TEDx Penn, April 12, 2015.
https://www.youtube.com/watch?v=sj3Pn_pogXw
157. Keynote Speaker, Fiatch 2015 Technology Showcase and Conference, Boca Raton, Florida, April 14, 2015.
158. Keynote Speaker, Atlantic Council's Global Strategy Forum, Washington DC, April 29, 2015.
159. Keynote Speaker, Robo Universe, New York City, May 13, 2015.
160. Hall Lecture, Vanderbilt University, October 12, 2015.
161. Triangle Computer Science Distinguished Lecturer Series (TCS DLS), University of North Carolina, Chapel Hill, Duke University, Durham, and North Carolina State University, Raleigh, October 19, 2015.
162. Keynote Speaker, KLA- Tencor, Bi-annual engineering conference, Monterey CA, Oct 26, 2015.
163. Distinguished Speaker Series, Khalifa University, January 20, 2016.
164. Distinguished Lecture Series, Erik Jonsson School of Engineering and Applied Science, University of Texas at Dallas, April 1, 2016.
165. Alexander Graham Christie Lecture, Johns Hopkins University, April 15, 2016.
166. Air Products Distinguished Lecture, Penn State University, April 26, 2016.
167. Distinguished Speaker, Shanghai Tech Symposium, Shanghai, China, June 24th, 2016

Supervision of Doctoral Dissertations

1. Nathan Ulrich, Mechanical Design Optimization of Manipulator Design Performance, Fall 1990. Research Scientist, Woods Hole Oceanographic Laboratory, Massachusetts.
2. Jung-ha Kim, Kinematics and Statics of Multifingered Grippers, Fall 1990. Professor, Kook Min University, Seoul, N. Korea.
3. Yin-Tien Wang, Analysis and Simulation of Mechanical Systems with Multiple Frictional Contacts, Summer 1992. Professor, Tamkang University, Taiwan.
4. Nilanjan Sarkar, Control of Mechanical Systems with Rolling Contacts, Spring 1993 (co-supervised by X.Yun). Currently, Professor, Vanderbilt University.
5. Mohamed Ouerfelli, Kinematics of head movements in paraplegics and interaction with robot manipulators, November 1994. Assistant Professor, King Fahd University, Saudi Arabia.
6. William Howard, Stability of Grasps: Beyond Force Closure, June 1995. Currently, Manager, Kliklok Corporation, Atlanta, Georgia.

7. Chau-Chang Wang, Kinematics and Control of Redundant Nonholonomic Systems, August 1995. Currently, Associate Professor, National Sun Yat-sen University, Taiwan.
8. Milos Zefran, Continuous methods for motion planning, December 1996. Currently, Assistant Professor, University of Illinois, Chicago, Recipient of the NSF Career Award.
9. Jaydev Desai, Motion planning and control of cooperative robotic systems (co-supervised by J. P. Ostrowski). Currently, Professor, University of Maryland.
10. Venkat Krovi, Design and Virtual Prototyping of User Customized Assistive Devices. (co-supervised by G. K. Ananthasuresh). Currently, Assistant Professor, McGill University, Canada.
11. Thomas G. Sugar. Coordination of multiple mobile robots for material handling. Currently, Assistant Professor, Arizona State University, Phoenix, Arizona.
12. Peter Kraus. Modeling of Rigid Body Contacts for Dynamic Simulation.
13. Peng Song. Dynamics, Analysis and Simulation of Multibody Systems with Frictional Contacts. Currently, Assistant Professor, Rutgers University of Pennsylvania.
14. Joel Esposito. Simulation and Control of Hybrid Systems with Applications to Multi-agent Mobile Robotics. Currently, Assistant Professor, U. S. Naval Academy.
15. Aveek Das, Cooperative Control of Robot Formations. 2004. Currently at Sarnoff Corporation.
16. Calin Belta. Geometric Methods for Multirobot Planning and Control. 2003. Currently, Assistant Professor, Drexel University.
17. Rahul Rao, Image Based Control of an Unmanned Ground Vehicle from an Overhead Camera, 2004. Currently at Intel Corporation.
18. Sachin Chitta, Dynamics and Control of Modular Locomotion Systems, 2005. Research Scientist, Willow Garage.
19. Sarangi Patel Parikh, A Framework for Computer Mediated Motion Control: Human Robot Augmentation with Applications to Assistive Technology, 2005. Assistant Professor, U. S. Naval Academy.
20. Meghann Lomas, December 2006. Lockheed Martin Corporation.
21. Jongwoo Kim, August 2006. Nautilus Hyosung, S. Korea.
22. Mong-Ying (Ani) Hsieh, August 2007. Assistant Professor, Drexel University.
23. David Cappelleri, Flexible Automation for Micro and Meso-Scale Manipulation Tasks with Applications to Manufacturing and Biotechnology, August 2008. Assistant Professor, Purdue University.
24. Nathan Michael, Planning and control for teams of robots in complex environments, December 2008. Research Assistant Professor, Carnegie Mellon University.
25. Ethan Stump, Control for Localization and Visibility Maintenance of an Independent Agent using Robotic Teams, December 2009. Army Research Laboratory.
26. Spring Berman, Abstractions, Analysis Techniques, and Synthesis of Scalable Control Strategies for Robot Swarms, May 2010. Postdoctoral Fellow, Harvard University, Assistant Professor, Arizona State University.
27. Mahmut Selman Sakar, MicroBioRobots for Single Cell Manipulation, September 2010 (co-supervised with G. Pappas). Postdoctoral Fellow, Massachusetts Institute of Technology.
28. Nora Ayanian, August 2011 (co-supervised with D. Koditschek). Assistant Professor, University of Southern California.
29. Jonathan Fink, August 2011. Army Research Laboratory.
30. Subhrajit Bhattacharya, Jan 2012, Postdoctoral Fellow, Department of Mathematics, University of Pennsylvania.
31. Daniel Mellinger, Jan 2012, Co-Founder and President, KMel Robotics.
32. Quentin Lindsey, July 2012, Aeroenvironment Inc.
33. Steven Gray, July 2013, Lockheed Martin.
34. Soonkyum Kim, August 2013, Postdoctoral Fellow, Carnegie Mellon University.
35. Matthew Turpin, August 2014, KMel Robotics.
36. Shaojie Shen, August 2014, Assistant Professor, Hong Kong University of Science and Technology.
37. Jun Seo, August 2014, Assistant Professor, Hong Kong University of Science and Technology.
38. Ben Charrow, May 2015, Google
39. Philip Dames, June 2015, Asst. Prof, Temple University

Postdoctoral Fellows

1. Elan Henis, 1992-93 (currently at the IBM Haifa Research Laboratory).
2. Herman Bruyninckx, 1996-97 (currently on the faculty of the Katholik University, Leuven, Belgium).
3. Jean-Marc Vezien, 1996-98 (currently at INRIA, France).
4. Greg Grudic, 1998-01 (currently Asst. Prof., Computer Science, Univ. Colorado).
5. Rafael Fierro, 1999 –01 (currently Prof., Electrical Engineering, University of New Mexico).
6. John Ben Southall, 1999- 00 (currently at Sarnoff).
7. Herbert Tanner, 2001-2002 (joint with George Pappas, currently Professor, University of Delaware)
8. Xiaoye Wang, 2002 (joint with Harvey Rubin and G. K. Ananthasuresh)
9. Ben Grocholsky, 2003-2006 (Research Scientist, Carnegie Mellon University).
10. Peng Song, 2003-2005 (currently Asst. Prof., Rutgers University).
11. Luiz Chaimowicz, 2003-2005 (currently Asst. Prof., Federal University of Mineas Gerais, Brazil).
12. Peng Cheng, 2005-2008 (currently Research Scientist, Mathworks Inc.).
13. Adam Halasz, 2005-2008 (currently Assistant Professor, West Virginia University).
14. Savvas Loizou, 2005 – 2007 (Asst. Prof., Frederick University, Cyprus).
15. Bogdan Gavrea, 2006 – 2007 (Asst. Prof., Technical University of Cluj-Napoca, Romania).
16. Jason Derenick, 2009- 2011. (United Technologies).
17. Vinutha Kallem, 2008 – 2011. (Sarnoff Corporation).
18. Qimi Jiang , 2009 – 2011. (Mining Technology International, Sudbury, Ontario).
19. Mac Schwager, 2011-12. (Asst. Professor, Boston University).
20. Koushil Sreenath, 2012-13. (Asst. Prof., Carnegie Mellon University).
21. Mihail Pivtoraiko, 2012-13. (Founder, Aptonomy).
22. Pratap Tokekar, 2014-2015. (Asst. Prof, Virginia Tech)
23. Subhrajit Bhattacharya 2012-2016 (Asst. Prof, Lehigh University)
24. Giuseppe Loianno 2013-2016
25. Jnaneshwar Das 2014-
26. Amanda Prorok 2015-
27. Konstantinos Karydis 2015-2017 (Asst. Prof, University of California, Riverside)
28. Philip Dames 2015-2016 (Asst. Prof, Temple University)
29. Nikolay Atanasov 2015-2017 (Asst. Prof, University of California, San Diego)

Supervision of Masters Thesis

1. Michael C. Johnson, Force and Motion Control of Redundantly Actuated Robotic Systems with Closed Kinematic Chains, Fall 1989.
2. George Pfreundschuh, Kinematics, Design and Control of a Parallel Manipulator, Summer 1990.
3. Leslie Johnson, A Numerical Technique for Determination of Contact Forces for Multifingered Robotic Grippers, Summer 1991.
4. Thomas G. Sugar, Design and Control of an in-Parallel Pneumatically-Actuated Manipulator, Summer 1992.
5. J. Chris Gerdes, Modeling and Analysis of the Dynamic Behavior of Spur Gears with Applications To Control, Summer 1992.
6. Seshadri Narasimhan, Control of Robot Manipulators in Singular Configurations (May 1994).
7. Greg Garvin, Kinematics and Trajectory Generation in Two-Armed Reaching and Manipulation (May 1994).
8. Parris Wellman, An Adaptive Mobility System, August 1994.
9. Milos Zefran, Numerical Techniques for Time Optimal Robot Control, August 1995.
10. Venkat Krovi, Modeling and Control of a Hybrid Locomotion System, December 1995.
11. Brad Dufour, Strength Amplification in Assistive Devices for People with Physical Disabilities, December 1997.
12. Robert Breslawski, Articulated wheeled and legged mobility system for uneven terrain, December 1999.
13. Dimitris Theodorakatos, Cable-Actuated Parallel Manipulators, May 2007.
14. Erik Smith, Path-planning and control with workspace constraints of cable-actuated parallel manipulators, December 2008.
15. Dinesh Thakur, May 2011.

16. Mike Shomin, July 2011.
17. Yash Mulgaonkar, Automated Recharging for Persistence Missions with Multiple Micro Aerial Vehicles, May 2012.
18. Gareth Cross, Sparse Monocular Visual Odometry, May 2015. Skydio.
19. Cedric de Crousaz, May 2015.

Patents

Kumar, V., Wellman, P. and Krovi, V., "Adaptive Mobility System," U.S. Patent No. 5,513,716, April 16, 1996.

Daniilidis, K., Angelopoulou, E. and Kumar, V., "Multispectral Omnidirectional Optical Sensor and Methods Therefore," U. S. Patent No. 6,982,743, January 3, 2006.

Membership on Editorial Boards

- Editorial Board, *Journal of the Franklin Institute* (1994 - 2000).
- Associate Editor, *IEEE Transactions on Robotics and Automation* (1994-1998).
- Associate Editor, *ASME Journal of Mechanical Design* (1997- 2001).
- Editorial Board, *Electronic Journal of Computational Kinematics* (2001-2002).
- Editor, *IEEE Transactions on Automation Science and Engineering* (2007-2012)
- Editorial Board, *Springer Tracts on Advanced Robotics* (2009 -)
- Associate Editor, *ASME Journal of Mechanisms and Robotics* (2009- 2014).
- Editorial Board, *Autonomous Robots* (2010 -).
- Advisory Board, *IEEE Transactions on Automation Science and Engineering* (2012 - present)
- Technical Editor, *ASME Journal of Mechanisms and Robotics* (2014-).

Press Coverage

1. Scientific American, *Free wheeling*, C. Seife, December 1995.
2. Philadelphia Inquirer, *Walking wheelchair*, Leslie Nicholson, February 12, 1998. (Excerpts from this two page feature appeared in newspapers all over the country.)
3. Advance, *Robotic wheelchair*, Jolynn Weiler, March 30, 1998: pages 35-36.
4. Philadelphia Channel 6 TV, Prime Time, 1998. (This five minute segment on robotics research featuring my work ran several times through 1998.)
5. Fox News, Interview, July 25, 1998.
6. Financial Times, Interviewed on robotics exhibits by high school students at the International Science Fair in Philadelphia, May 1999.
7. Prism, American Society of Engineering Educators, feature articles on robotics technology and education, March 2000.
8. Wall Street Journal, features robotics technology for servicing satellites, February 2005.
9. Philadelphia Business Journal, *Robots putting their heads together*, June 10, 2005, <http://philadelphia.bizjournals.com/philadelphia/stories/2005/06/13/story1.html>. (Also appeared on MSNBC – <http://msnbc.msn.com/id/8199356/>)
10. Philadelphia Inquirer, September 2006.
11. National Geographic, June 2007. <http://www7.nationalgeographic.com/ngm/0707/feature5/>.
12. SAAST Robotics for High School Students, Fox TV, Channel 29 and NBC TV, Channel 3, Philadelphia, July 27, 2007. NSF Press release: http://www.nsf.gov/news/news_summ.jsp?cntn_id=110002&org=NSF&from=news.
13. Interview on Aggregation and Swarm Behaviors on the one hour Seattle Public Radio *Weekday* Program, February 9, 2009. <http://www.kuow.org/program.php?id=16878>.
14. Coverage of work on autonomous aerial robots. New Scientist number 1 video clip of the month, New York Times one of five robots to watch, Popular Science, Engadget, New Yorker
 - <http://www.newscientist.com/article/dn19032-new-scientist-tv--best-of-the-web.html>

- <http://bits.blogs.nytimes.com/2010/07/15/five-robots-to-watch/?src=me&ref=technology>
 - <http://www.popsci.com/technology/article/2010-07/video-upenns-quadcopters-now-work-teams-lift-heavy-payloads>
 - <http://www.popsci.com/technology/article/2010-06/upenns-autonomous-quadcopter-makes-navigating-tight-spaces-look-easy>
 - http://www.newyorker.com/reporting/2012/05/14/120514fa_fact_paumgarten
15. Coverage of work on swarms of aerial robots.
- <http://www.cnn.com/2012/03/04/opinion/ted-kumar-flying-robots/index.html>
 - <http://online.wsj.com/article/SB10001424052970203370604577263320286138892.html>
 - http://www.newyorker.com/reporting/2012/05/14/120514fa_fact_paumgarten?currentPage=1
16. PBS Nova, The Rise of the Drones, <http://www.pbs.org/wgbh/nova/military/rise-of-the-drones.html>
17. Philadelphia Magazine, October 2012.
Smartest People in Philadelphia, <http://www.phillymag.com/articles/smartest-people-philadelphia/>.
18. Popular Mechanics, October 22, 2013, The Rise of Autonomous Vehicles.
<http://www.popularmechanics.com/how-to/blog/the-rise-of-the-autonomous-vehicles-16070850>.
19. Popular Mechanics Breakthrough Awards, October 2013.
<http://www.popularmechanics.com/breakthrough-award-winners>
20. Pennsylvania Cable Network Roundtable with Legislators and Lawyers.
<http://pcntv.com/2014/03/18/tuesday-at-900-pm-drones-and-the-law/>
21. Can China replicate SiValley? China CCTV, September 9, 2015.
<http://english.cntv.cn/2015/09/10/VIDE1441840803127444.shtml>

Professional Affiliations

1. Fellow, American Society of Mechanical Engineers
2. Fellow, Institution of Electrical and Electronic Engineers
3. Member, American Society of Engineering Education
4. Member, Association for Computing Machinery

Professional Society Committees

- Chair, Mechanisms and Robotics Committee, ASME Design Engineering Division, 2006-2007.
- Administrative Committee Elected Member, IEEE Robotics and Automation Society, 2007-2009.
- Associate Vice President, Administrative Committee, IEEE Robotics and Automation Society, 2008-2009.
- Administrative Committee Member at Large, IEEE Robotics and Automation Society, 2010-12.
- Member, Design Engineering Division Executive Committee, ASME, 2008-2013, including Chair of DED in 2012-13.
- Associate Vice President, Administrative Committee, IEEE Robotics and Automation Society, 2014-present.

Membership on Planning and Review Committees

- Robotics Council, National Science Foundation, 2000-2002.
- Robotics Technical Advisory Board, Army Research Laboratories, 2004.
- NAS Committee on Assessment of Options for Extending the Life of the Hubble Space Telescope, 2004.
- NSF/NASA Committee on Assessment of International Research and Development in Robotics, 2004.
- National Resource Council Committee to review NASA's Capability Roadmaps on Human Exploration Systems and Mobility and Autonomous Systems and Robotics, 2005.
- NSF Council of Visitors, Computer and Information Science and Engineering, 2006.
- CCC Robotics Roadmap Committee, 2008-09.
- Army Science Planning and Strategy Meeting on Intelligent Systems, 2013

Organization of Major Conferences and Workshops

- Conference Chair, *27th Biennial Conference on Mechanisms and Robotics, ASME Design Engineering Technical Conferences*, Mechanisms Committee, Montreal, September 2002.
- *Block Island Workshop on Cooperative Control*, Organizer (with N. Leonard and S. Morse), Block Island, June 10-12, 2003.
- *Robotics and Emergency Response*, Organizer (with D. Rus and S. Singh), *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) Workshop*, October 26, 2003.
- *Workshop on Swarming in Natural and Engineered Systems*, NAPA, CA, August 2-3, 2005.
- General Conference Chair, *ASME Design Engineering Technical Conferences*, Philadelphia, September 2006.
- Conference Co-Chair, *International Symposium on Experimental Robotics*, Rio de Janeiro, Brazil, July 2006.
- Local Arrangements Co-Chair, *Robotics Science and Systems*, Philadelphia, PA, August 13-15, 2006.
- *2nd Biennial Workshop on Swarming in Natural and Engineered Systems*, Philadelphia, PA, May 16-17, 2007.
- Conference Co-Chair, *International Symposium on Experimental Robotics*, Athens, Greece, July 2008.
- *3rd Biennial Workshop on Swarming in Natural and Engineered Systems*, Block Island, RI, June 3-4, 2009.
- Program Chair, *IEEE International Conference on Robotics and Automation*, Anchorage, Alaska, 2010.
- Conference Co-Chair, *International Symposium on Experimental Robotics*, New Delhi, India, December 2010.
- Conference Co-Chair, *International Symposium on Experimental Robotics*, Quebec City, Canada, June 2012.
- Conference Co-Chair, *International Symposium on Experimental Robotics*, Marrakech, Morocco, June 2014.

Program Committees

- Program Committee, *4th International Conference on Advanced Robotics*, 1988.
- Applied Mechanics Division Committee, American Society of Mechanical Engineers, Philadelphia, 1988 - 1991.
- Program Committee, *5th International Conference on Advanced Robotics*, 1991.
- Program Committee, *International Conference on Intelligent Robot Systems (IROS'95)*, Pittsburgh, PA, 1995.
- Program Committee, *Second ECPD International Conference on Advanced Robotics, Intelligent Automation and Active Systems*, Vienna, Austria, 1996.
- Program Committee, *IEEE International Conference on Robotics and Automation*, Leuven, Belgium, 1997.
- Co-organizer of workshop "New Directions in Contact Analysis and Simulation," *International Conference on Robotics and Automation*, May 16, 1998.
- Program Committee, *Mechanisms Conference, ASME Design Technical Conferences*, Atlanta, Sept 13-16, 1998.
- Program Committee, *International Conference on Rehabilitation Robotics*, Stanford, Palo Alto, 1999.
- Program Committee, *International Conference on Robotics and Automation*, Stanford, April 2000.
- ASME Design Engineering Division, Mechanisms Committee, 2000-2006.
- Program Committee, *IEEE/RSJ International Conference on Intelligent Robots and Systems*, Hawaii, October, 2001.
- Program Committee, *ASME Design Engineering Technical Conferences*, Mechanisms Committee, Pittsburgh, September 2001.
- Program Committee, ISORA 2002 9th International Symposium on Robotics and Applications, Orlando, Florida.
- Program Committee, ISRA 2002, 3rd International Symposium on Robotics and Automation, Toluca, Mexico.
- Program Committee, *International Conference on Robotics and Automation*, Washington, D.C., May 2002.

- Program Committee, *International Conference on Robotics and Automation*, Taipei, Taiwan, September 2003.
- Program Committee, *International Conference on Robotics and Automation*, New Orleans, LA, May 2004.
- Program Committee, *IEEE/RSJ International Conference on Intelligent Robots and Systems*, Las Vegas, October, 2003.
- Program Committee, *7th International Symposium on Distributed Autonomous Robotic Systems*, Toulouse June 23-25, 2004.
- Program Committee, *5th International Symposium on Intelligent Autonomous Vehicles*, Lisbon, Portugal, July 2-4, 2004.
- Program Committee, *International Conference on Robotics and Automation*, Barcelona, April 2005.
- Program Committee, *IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2005.
- Senior Program Committee, *Robotics: Science and Systems*, Cambridge, June, 2005.
- Program Co-Chair, *IEEE International Conference on Automation Science and Engineering*, Scottsdale, Arizona, 2007.
- Senior Program Committee, *Autonomous Agents and Multi-Agent Systems (AAMAS)*, 2008.
- Senior Program Committee, *International Conference on Robotics and Automation*, Pasadena, April 2008.
- Senior Program Committee, *International Conference on Robotics and Automation*, Tokyo, May 2009.
- General Conference Co-Chair, *IEEE International Conference on Automation Science and Engineering*, Bangalore, India 2009
- Program Chair, *International Conference on Robotics and Automation*, Anchorage, May 2010.
- Senior Program Committee, *International Conference on Robotics and Automation*, Shanghai, May 2011.
- Senior Program Committee, *International Conference on Robotics and Automation*, Minneapolis, May 2012.
- Senior Program Committee, *International Conference on Robotics and Automation*, Karlsruhe, May 2013.
- Board Member, *Robotic Science and Systems*, 2013-17.
- Senior Program Committee, *IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2014.