Ronald S. Fearing
Professor in the Graduate School
Dept. of Electrical Engineering and Computer Sciences
University of California
Berkeley, CA 94720
http://people.eecs.berkeley.edu/~ronf

Research Objectives

Biomimetic milli-robotics including flying and all-terrain crawling milli-robots, millirobot rapid prototyping, milli-robot teams for exploration, milli-robot actuation and gecko-inspired surface gripping.

Experience

Professor of the Graduate School, UC Berkeley, (7/1/22-6/30/25)

Professor Emeritus, Dept. of EE&CS, UC Berkeley, (7/21-present).

Professor, Dept. of EE&CS, UC Berkeley, (7/00-6/21).

John William MacKay, Jr. Electrical Engineering Professorship (7/16-6/21).

Vice Chair for Graduate Matters, (7/16-6/21).

Vice Chair for Undergraduate Matters, (7/00-6/06).

Associate Professor, Dept. of EE&CS, UC Berkeley, (7/93-6/00).

Visiting Professor, ETH Zurich, Switzerland (7/12-6/13)

Visiting Associate Professor, Nagoya University, Nagoya, Japan, (9/91-11/91).

Assistant Professor, Dept. of EE&CS, UC Berkeley, (1/88 - 6/93).

Research Assistant, Dept. of Electrical Engineering, Stanford University, (9/83-12/87).

> Interpretation of contact geometry from tactile strain measurements, object pose determination using weak models, and implementation and analysis of a cylindrical tactile sensing array for a dextrous hand. Also developed NYMPH multiprocessor system which used 7 real-time computers for dextrous hand servoing and tactile processing. Implemented part reorientation ‘‘twirling’’ using Stanford/JPL hand.

Co-op student, General Electric Corporate Research and Development, Schenectady NY, (1981-1983).

> Analyzed grasping and tactile mechanics, worked on tactile sensor development, pneumatic finger, and a distributed sensor and control network for homes.

Education

Ph.D. in Electrical Engineering, Stanford University (9/83 - 12/87).
Thesis title ‘‘Tactile Sensing, Perception, and Shape Interpretation’’, advisor Prof. Thomas O. Binford.

S.B. and S.M. in EE&CS, M.I.T., (9/79 - 9/83).
Thesis title ‘‘Touch Processing for Determining a Stable Grasp’’, advisor Prof. John M. Hollerbach.

Honors and Awards

NSF Presidential Young Investigator, 1991.

Third Place, Second International Microrobot Mountain Climbing Contest, Nagoya, Japan, October 9,

1991.

NAE 2002 US Frontiers of Engineering Symposium

Bakar Faculty Fellow, 2023-2026

Best paper award:

- E.J. Nicolson and R.S. Fearing, ‘‘Dynamic Modelling of a Part Mating Problem: Threaded Fastener Insertion’’, *IEEE Workshop on Intelligent Robots and Systems,* Osaka, Japan, Nov. 3-5, 1991.
- D.W. Haldane, J.K. Yim, R.S. Fearing, ‘‘Repetitive extreme-acceleration (14-g) spatial jumping with Salto-1P’’, *IEEE/RSJ Int. Conf. on Int. Robots and Systems,* Vancouver, Sep. 24-28, 2017.
- C. Li, C.C. Kessens, R.S. Fearing and R.J. Full, ‘‘Mechanical principles of dynamic terrestrial self-righting using wings’’, *Advanced Robotics* , Sept. 2017, DOI: 10.1080/01691864.2017.1372213.

Best Student Paper Award:

- F. Quan, T. Zhang, C. Li, P. Maserati, A.M. Hoover, P. Birkmeyer, A. Pullin, R.S. Fearing, and D.I. Goldman, ‘‘Walking and running on yielding and fluidizing ground,’’ *Robotics Science and Systems 2012.* Sydney Australia, Jul. 9-13, 2012.
- E.W. Schaler, L. Jiang, C. Lee, and R.S.Fearing, ‘‘Bidirectional, thin-film repulsive-/attractive-force electrostatic actuators for a crawling milli-robot,’’ *MARSS 2018: Int. Conf. on Manipulation, Automation, and Robotics at Small Scales,* Nagoya July 4-8, 2018.
- J.K.Yim, E.K. Wang, and R.S. Fearing, ‘‘Drift-Free Roll and Pitch Estimation for High-Acceleration Hopping,’’ *IEEE Int. Conf. on Robotics and Automation,* Montreal, May 20-24, 2019.

Finalist for best student paper award:

M.D. Berkemeier and R.S. Fearing, ‘‘Control of a Two-Link Robot to Achieve Sliding and Hopping Gaits’’, *IEEE Int. Conf. on Robotics and Automation,* Nice France, May, 1992.

Finalist for best paper award:

- R.S. Fearing, K.H. Chiang, M. Dickinson, D.L. Pick, M. Sitti, and J. Yan, ‘‘Wing Transmission for a Micromechanical Flying Insect’’, *IEEE Int. Conf. on Robotics and Automation,* San Francisco, April 24-27, 2000.
- S. Baek and R.S. Fearing, ‘‘Flight forces and altitude regulation of 12 gram i-Bird,’’ *IEEE BioRob,* Tokyo Sept. 2010.
- D.W. Haldane, K.C. Peterson, F.L. Garcia Bermudez, and R.S. Fearing, ‘‘Animal-inspired Design and Aerodynamic Stabilization of a Hexapedal Millirobot,’’ *IEEE Int. Conf. on Robotics and Automation*, Karlsruhe, Germany May 6-10, 2013.
- A. Nagabandi, G. Yang,T.H. Asmar, G. Kahn, S. Levine, and R.S. Fearing, ‘‘Learning Image-Conditioned Dynamics Models for Control of Under-actuated Legged Millirobots,’’ *IEEE/RSJ Int. Conf. on Robots and Systems* Madrid, Oct. 1-5, 2018.
- Sebastian D. Lee, Stanley Wang, Duyi Kuang, Eric K. Wang, Justin K. Yim, Nathaniel H. Hunt, Ronald S. Fearing, Hannah S. Stuart, and Robert J. Full, ‘‘Free-ranging squirrels perform stable, above-branch landings by balancing using leg force and nonprehensile foot torque,’’ *Journal of Experimental Biology,* 27 February 2025.

Best Conference Video Award:

Joe Yan, et al ‘‘The Micromechanical Flying Insect’’ video presentation: *IEEE Int. Conf. on Robotics and Automation,* Washington, DC May 11-15, 2002.

Finalist for Best Conference Video Award:

David Zarrouk, Ronald Fearing ‘‘A One Actuator Steerable Autonomous Robot (1STAR),’’ video presentation: *IEEE Int. Conf. Robotics and Automation,* Hong Kong, June 2014.

Finalist for IEEE ICRA Best Paper Award on Robot Mechanisms and Design

M. Plecnik, K.M. Fearing, R.S. Fearing, ‘‘Adjustable Power Modulation for a Leg Mechanism Suitable for Running,’’ *IEEE Int. Conf. on Robotics and Automation,* Montreal, May 20-24, 2019.

Journal Papers

J1. B. He, N. Zhao, D. Y. Guo, C.H. Paxson, A. De Goyeneche, M. Lustig, C. Liu, and R.S. Fearing, ‘‘Design and Control of a Compact Series Elastic Actuator Module for Robots in MRI Scanners,’’ *IEEE/ASME Mechatronics*, TMECH.2026.3658501, February 2026.

J2. Justin K. Yim, Eric K. Wang, Sebastian D. Lee, Nathaniel H. Hunt, Robert J. Full, and Ronald S. Fearing, ‘‘Monopedal robot branch-to-branch leaping and landing inspired by squirrel balance control ,’’ *Science Robotics,* 19 March 2025.

J3. Sebastian D. Lee, Stanley Wang, Duyi Kuang, Eric K. Wang, Justin K. Yim, Nathaniel H. Hunt, Ronald S. Fearing, Hannah S. Stuart, and Robert J. Full, ‘‘Free-ranging squirrels perform stable, above-branch landings by balancing using leg force and nonprehensile foot torque,’’ *Journal of Experimental Biology,* 27 February 2025.

J4. Yifan You, Chen Dai, Shunheng Xin, Daniel Quintana, Wesley Shoap, Ronald S. Fearing, and Ezequiel Goldschmidt, ‘‘Design, fabrication, and testing of a new soft-pouch robot with 6 degrees of freedom to expand the reach of open and endonasal skull base approaches,’’ *Neurosurgical Focus*, vol. 57, no. 6, 2024.

J5. Yifan You, Chen Dai, Ezequiel Goldschmidt, and Ronald S. Fearing ‘‘Multi-Layer LDPE Pouch Robots Enabled by Inkjet-Printed Masking Layers,’’ *Advanced Materials Technologies*, 2024, 2401052.

J6. J.J. Page, L.K. Treers, S.J. Jorgensen, R.S. Fearing; H.S. Stuart, ‘‘The Robustness of Tether Friction in Non-idealized Terrains,’’ *IEEE Robotics and Automation Letters*, pp. 424, vol. 8 no. 1, Jan. 2023.

J7. L. Wang, J. Hodges, D. Yu, and R.S. Fearing, ‘‘Automatic modeling and fault diagnosis of car production lines based on first-principle qualitative mechanics and semantic web technology,’’ *Advanced Engineering Informatics*, v. 49, p.101248, 2021.

J8. M.M. Plecnik and R. S. Fearing, ‘‘Designing Dynamic Machines With Large-Scale Root Finding,’’ *IEEE Transactions on Robotics* Mar. 2020 DOI: 10.1109/TRO.2020.2975425.

J9. J.K. Yim, B.R.P. Singh, E.K. Wang, R. Featherstone, and R.S Fearing, ‘‘Precision Robotic Leaping and Landing Using Stance-phase Balance,’’ *IEEE Robotics and Automation Letters* February 2020.

J10. Y. Wu, J.K. Yim, J. Liang, Z. Shao, M. Qi, J. Zhong, Z. Luo, X. Yan, M. Zhang, X. Wang, R.S. Fearing, R.J. Full and Liwei Lin, ‘‘Insect-scale fast moving and ultrarobust soft robot ,’’ *Science Robotics* 31 Jul 2019 DOI: 10.1126/scirobotics.aax1594

J11. Dongwon Yun and R.S. Fearing, ‘‘Cockroach Millirobot Robot With Improved Load Capacity,’’ *ASME Journal of Mechanisms and Robots*, 11(3), 035001 Apr. 08, 2019. DOI 10.1115/1.4042626

J12. G-P. Jung, C.S. Casarez, J. Lee, S-M. Baek, S-J. Yim, S-H. Chae, R.S. Fearing, and K-J. Cho,

''JumpRoACH: A Trajectory-Adjustable Integrated Jumping-Crawling Robot,'' *IEEE/ASME Mechatronics*, vol. 24, no. 3, pp. 947-958, June 2019. DOI 10.1109/TMECH.2019.2907743

J13. K. Jayaram, J.-M. Mongeau, A. Mohapatra, P. Birkmeyer, R.S. Fearing and R.J. Full, ''Transition by head-on collision: Mechanically mediated maneuvers in cockroaches and small robots,'' *Journal of the Royal Society Interface,* 14 February 2018. DOI: 10.1098/rsif.2017.0664 2018.

J14. E.Schaler, T. Zohdi, R.S. Fearing ''Thin-Film Repulsive-Force Electrostatic Actuators,'' *Sensors and Actuators,* Dec. 26, 2017. https://doi.org/10.1016/j.sna.2017.12.054

J15. C. Li, C.C. Kessens, R.S. Fearing and R.J. Full, ''Mechanical principles of dynamic terrestrial self-righting using wings'', *Advanced Robotics* , Sept. 2017, DOI: 10.1080/01691864.2017.1372213.

J16. Y. Gao, H. Ota, E. W. Schaler, K. Chen, A. Zhao, W. Gao, H. M. Fahad, Y. Leng, A. Zheng, F. Xiong, C. Zhang, L.-C. Tai, P. Zhao, R. S. Fearing, A. Javey, ''Wearable Microfluidic Diaphragm Pressure Sensor for Health and Tactile Touch Monitoring,'' *Adv. Mater.* 2017, 1701985. https://doi.org/10.1002/adma.201701985

J17. M.M. Plecnik and R.S. Fearing, ''Finding Only Finite Roots to Large Kinematic Synthesis Systems,'' *ASME J. Mechanisms Robotics,* 2017;9(2):021005-021005-8.

J18. Mark M. Plecnik, Duncan W. Haldane, Justin K. Yim and Ronald S. Fearing, ''Design Exploration and Kinematic Tuning of a Power Modulating Jumping Monopod,'' *J. Mechanisms Robotics* 9(1), 011009 (Dec 07, 2016) JMR-16-1123; doi: 10.1115/1.4035117

J19. D.W. Haldane, M.M. Plecnik, J.K. Yim, R.S. Fearing, ''Robotic vertical jumping agility via series-elastic power modulation,'' *Science Robotics*, 6 Dec 2016. Vol. 1, Issue 1, DOI: 10.1126/scirobotics.aag2048

J20. C. Li, A.O. Pullin, D.W. Haldane, H.K. Lam, R.S. Fearing and R. J. Full, ''Terradynamically streamlined shapes in animals and robots enhance traversability through densely cluttered terrain'' *Bioinspiration and Biomimetics,* vol. 10, no. 4, pp. 046003, 2015.

J21. Duncan W. Haldane, Carlos S. Casarez, Jaakko T. Karras, et al. ''Integrated Manufacture of Exoskeletons and Sensing Structures for Folded Millirobots,'' *J. Mechanisms Robotics,* 7(2), 021011 (2015).

J22. D. Zarrouk and R.S. Fearing, ''Controlled In-Plane Locomotion of a Hexapod Using a Single Actuator'', *IEEE Transactions on Robotics,* vol. 31, no. 1, pp. 157, Feb. 2015.

J23. Bryan E. Schubert, Andrew G. Gillies, and Ronald S. Fearing, ''Angled microfiber arrays as low-modulus, low Poisson's ratio compliant substrates,'' *J. Micromech. Microeng.* 24 065016, 2014.

J24. A. G. Gillies and R.S. Fearing, ''Simulation of synthetic gecko arrays shearing on rough surfaces'', *Journal Roy. Society Interface,* vol. 11, no. 20140021, April 2014.

J25. Xiaobo Zhang, Zhibin Yu, Chuan Wang, David Zarrouk, Jung Woo Seo, Jim Cheng, Austin Buchan, Kuniharu Takei, Yang Zhao, Joel Ager, Junjun Zhang, Mark Hettick, Mark Hersam, Albert P. Pisano, Ronald Fearing, and Ali Javey, ''Photo- actuators and motors based on carbon nanotubes with selective chirality distributions,'' *Nature Communications,* vol. 5, no. 2983, 2014. (doi:10.1038/ncomms3983)

J26. A.G. Gillies, H. Lin, A. Henry, A. Ren, K. Shiuan, R.S. Fearing, and R.J. Full, ''Gecko toe and lamellar shear adhesion on macroscopic, engineered rough surfaces,'' *Journal of Experimental Biology,* online Oct. 10, 2013.

J27. T. Zhang, F. Qian, C. Li, P. Masarati, A. M. Hoover, P. Birkmeyer, A. Pullin, R.S. Fearing, and D.I. Goldman, ''Ground fluidization promotes rapid running of a lightweight robot,'' *The International Journal of Robotics Research,* June 2013 vol. 32, pp.859-869, doi:10.1177/0278364913481690

J28. Yongkwan Kim, Robert K. Claus, Francesca Limanto, Ronald S. Fearing, and Roya Maboudian, ‘‘Friction Characteristics of Polymeric Nanofiber Arrays against Substrates with Tailored Geometry,’’ *Langmuir,* June 2013.

J29. A. G. Gillies, J. Puthoff, M.J. Cohen, K. Autumn, and R. S. Fearing, ‘‘Dry Self-Cleaning Properties of Hard and Soft Fibrillar Structures,’’ *ACS Applied Materials and Interfaces,* June 2013.

J30. Andrew G. Gillies, Jonghun Kwak, Ronald S. Fearing, ‘‘Controllable particle adhesion with a magnetically actuated synthetic gecko adhesive’’ *Advanced Functional Materials,* 7 Feb. 2013. DOI: 10.1002/adfm.201203122

J31. Jongho Lee and Ronald S. Fearing, ‘‘Wet Self-Cleaning of Superhydrophobic Microfiber Adhesives Formed from High Density Polyethylene,’’ *Langmuir,* DOI: 10.1021/la303017a October 16, 2012.

J32. Jean-Michel Mongeau, Brian McRae, Ardian Jusufi, Paul Birkmeyer, Aaron M. Hoover, Ronald Fearing, Robert J. Full, ‘‘Rapid Inversion: Running Animals and Robots Swing like a Pendulum under Ledges’’ *PLoS ONE*, vol. 7, no. 6, 6 June 2012. dx.plos.org/10.1371/journal.pone.0038003

J33. Y. Kim, F. Limanto, D-H. Lee, R.S. Fearing, and R. Maboudian, ‘‘Role of Counter-substrate Surface Energy in Macroscale Friction of Nanofiber Arrays,’’ *Langmuir,*, 2012. dx.doi.org/10.1021/la204078z

J34. T. Takahashi, K. Takei, A. G. Gillies, R. S. Fearing, A. Javey, ‘‘Carbon Nanotube Active-Matrix Backplanes for Conformal Electronics and Sensors’’, *Nano Letters,* 11, 5408-5413, 2011.

J35. K Peterson, P Birkmeyer, R Dudley, and R S Fearing, ‘‘A Wing-Assisted Running Robot and Implications for Avian Flight Evolution,’’ *Bioinspiration and Biomimetics,* vol. 6, no. 046008 doi:10.1088/1748-3182/6/4/046008, Oct. 18, 2011.

J36. Dae Ho Lee, Yongkwan Kim, Ronald S. Fearing, and Roya Maboudian, ‘‘Effect of Fiber Geometry on Macroscale Friction of Ordered Low-Density Polyethylene Nanofiber Arrays,’’ *Langmuir,* July 20, 2011. DOI: 10.1021/la201498u

J37. Andrew G. Gillies and Ronald S. Fearing, ‘‘Shear Adhesion Strength of Thermoplastic Gecko-Inspired Synthetic Adhesive Exceeds Material Limits,’’ *Langmuir,* August 17, 2011, DOI: 10.1021/la202085j.

J38. X. Zhang, C.L. Pint, M.H. Lee, B.E. Schubert, A. Jamshidi, K. Takei, H. Ko, A. Gillies, R. Bardhan, J.J. Urban, M. Wu, R. Fearing, and A. Javey, ‘‘Optically- and Thermally-Responsive Programmable Materials Based on Carbon Nanotube-Hydrogel Polymer Composites’’ *Nano Letters,* Article ASAP, July 2011. DOI: 10.1021/nl201503e

J39. K. Takei, T. Takahashi, J.C. Ho, H. Ko, A.G. Gillies, P.W. Leu, R.S. Fearing, and A. Javey, ‘‘Nanowire active-matrix circuitry for low-voltage macroscale artificial skin,’’*Nature Materials,* 12 Sept. 2010, doi:10.1038/NMAT2835

J40. A.G. Gillies and R.S. Fearing, ‘‘A micromolded connector for reconfigurable millirobots,’’ *J. Micromech. Microeng.* 20 (2010) 105011.

J41. J. Lee, B. Bush, R. Maboudian, and R.S. Fearing, ‘‘Gecko-inspired Combined Lamellar and Nanofibrillar Array for Adhesion on Non-planar Surface,’’ *Langmuir,* DOI: 10.1021/la9029672 Oct. 2009.

J42. H. Ko, Z. Zhang, Y.-L. Chueh, J.C. Ho, R.S. Fearing, and A. Javey, ‘‘Wet and Dry Adhesion Properties of Self-Selective Nanowire Connectors’’ *Advanced Functional Materials,* 25 August 2009. DOI:10.1002/adfm.200901178

J43. H. Ko, J. Lee, B.E. Schubert, Y.-L. Chueh, P.W. Leu, R.S. Fearing, and A. Javey, ‘‘Hybrid CoreShell Nanowire Forests as Self-Selective Chemical Connectors,’’ *Nano Letters,* April 24, 2009, DOI:

10.1021/nl900343b

J44. E. Steltz and R.S. Fearing, ‘‘Dynamometer Power Output Measurements of Miniature Piezoelectric Actuators,’’ *IEEE/ASME Trans. on Mechatronics,* vol. 14, no. 1, pp.1-10, 2009.

J45. S. Baek and R. S. Fearing, ‘‘Reducing Contact Resistance Using Compliant Nickel Nanowire Arrays,’’ *IEEE Trans. on Components and Packaging Technology,* vol. 31, no. 4, pp. 859-868, Dec. 2008.

J46. J. Lee, R. S. Fearing, K. Komvopolous, ‘‘Directional adhesion of gecko-inspired angled microfiber arrays,’’ *Appl. Phys. Lett.* 93, 191910 (2008); DOI:10.1063/1.3006334

J47. J. Lee and R.S. Fearing, ‘‘Contact Self-cleaning Synthetic Gecko Adhesive from Polymer Nanofibers,’’ *Langmuir,* 10 Sep. 2008, doi:10.102/la8021485.

J48. R.J. Wood, S. Avadhanula, R. Sahai, E. Steltz, R.S. Fearing, ‘‘Microrobot design using fiber reinforced composites,’’ *ASME Journal of Mechanical Design,* vol. 130, no. 5, 2008. http://link.aip.org/link/?JMD/130/052304

J49. C. Majidi and R. Fearing, ‘‘Adhesion of an elastic plate to a sphere,’’ *Proc. Royal Society, A,* doi:10.1098/rspa.2007.0341, Feb. 2008.

J50. J. Lee, C. Majidi, B. Schubert, R.S. Fearing ‘‘Sliding induced adhesion of stiff polymer microfiber arrays: 1. Macroscale behaviour,’’
Journal Royal Society, Interface, Jan. 22, 2008. 10.1098/rsif.2007.1308

J51. B. Schubert, J. Lee, C. Majidi, R.S. Fearing, ‘‘Sliding induced adhesion of stiff polymer microfiber arrays: 2. Microscale behaviour,’’
Journal Royal Society, Interface, Jan. 22, 2008. 10.1098/rsif.2007.1309

J52. B. Schubert, C. Majidi, R. E. Groff, S. Baek, B. Bush, R. Maboudian, R.S. Fearing, ‘‘Towards friction and adhesion from high modulus microfiber arrays,’’ *Journal of Adhesion Science and Technology,* 21(12-13), pp. 1297-1315 (2007).

J53. R.J. Wood, S. Avadhanula, E. Steltz, M. Seeman, J. Entwistle, A. Bachrach, G. Barrows, S. Sanders, and R.S. Fearing, ‘‘An Autonomous Palm-Sized Gliding Micro Air Vehicle: Design, Fabrication, and Results of a Fully Integrated Centimeter-Scale MAV,’’ *IEEE Robotics and Automation Magazine*, vol. 14, no. 2, pp. 82-91, June 2007.

J54. C. Majidi, R.E. Groff, and R.S. Fearing, ‘‘Analysis for Shaft-loaded Membrane Delamination using Stationary Principles’’ *Mathematics and Mechanics of Solids,* January 2007, 1081286506068823. Vol. 13, No. 1, 3-22 (2008).

J55. K. Autumn, C. Majidi, R.E. Groff, A. Dittmore, and R. Fearing, ‘‘Effective elastic modulus of isolated gecko setal arrays,’’ *Journal of Experimental Biology,* vol. 209, pp. 3558-3568, 2006.

J56. C. Majidi, R.E. Groff, K. Autumn, S. Baek, B.Bush, N. Gravish, R. Maboudian, Y. Maeno, B. Schubert, M. Wilkinson, and R.S. Fearing, ‘‘High friction from a stiff polymer using micro-fiber arrays,’’ *Physical Review Letters* , vol. 97, no. 076103, 18 August 2006.

J57. C. S. Majidi, R.E. Groff, and R.S. Fearing, ‘‘Attachment of Fiber Array Adhesive through Side Contact,’’ *Journal of Applied Physics,* vol. 98, 103521 (2005).

J58. R.J. Wood, E. Steltz, and R.S. Fearing ‘‘Optimal Energy Density Piezoelectric Bending Actuators,’’ *Sensors and Actuators,* Vol. 119/2 pp. 476-488, 2005.

J59. M. Sitti and R.S. Fearing, ‘‘Synthetic Gecko Foot-Hair Micro/Nano-Structures as Dry Adhesives,’’ *Journal of Adhesion Science and Technology,* vol. 17, no.8, pp. 1055-1074, 2003.

J60. D. Campolo, M. Sitti, and R.S. Fearing, ‘‘Efficient Charge Recovery Method for Driving

Piezoelectric Actuators in Low Power Applications," *IEEE Trans. on Ultrasonics, Ferroelectrics and Frequency Control,* vol. 50, no.3, pp. 237-244, Mar. 2003.

J61. K. Autumn, M. Sitti, Y.A. Liang, A.M. Peattie, W.R. Hansen, S. Sponberg, T. Kenny, R. Fearing, J.N. Israelachvili, and R.J. Full, ''Evidence for van der Waals adhesion in gecko setae," *Proceedings National Academy of Sciences,* vol. 99, no. 19, pp. 12252-12256, September 17, 2002.

J62. J. Yan, S.A. Avadhanula, J. Birch, M.H. Dickinson, M. Sitti, T. Su, and R.S. Fearing, ''Wing transmission for a micromechanical flying insect," *Journal of Micromechatronics*, vol. 1, no. 3, pp. 221-238, 2002.

J63. M. Moll, K. Goldberg, M.A. Erdmann, and R. Fearing, ''Aligning parts for microassembly," *Assembly Automation,* vol. 22, no. 1, pp. 46-54, 2002.

J64. K. Autumn, Y. Liang, T. Hsieh, W. Zesch, W.-P. Chan, T. Kenny, R. Fearing, and R.J. Full, ''Adhesive force of a single gecko foot-hair'', *Nature,* vol. 405, pp. 681-685, June 8, 2000.

J65. G. Moy, U. Singh, E. Tan and R.S. Fearing, ''Human Psychophysics for Teletaction System Design'', *Haptics-e, The Electronic Journal of Haptics Research,* vol. 1, No. 3, February 18, 2000.

J66. M.D. Berkemeier and R.S. Fearing, ''Tracking Fast Inverted Trajectories of the Underactuated Acrobot'', *IEEE Trans. on Robotics and Automation* , vol. 15, no.4, pp. 740-750, August 1999.

J67. M.D. Berkemeier and R.S. Fearing, ''Sliding and Hopping Gaits for the Underactuated Acrobot'', *IEEE Trans. on Robotics and Automation* , vol. 14, no.4, pp. 629-634, August 1998.

J68. F. Tendick, S.S. Sastry, R.S. Fearing, and M. Cohn, ''Applications of Micromechatronics in Minimally Invasive Surgery'', *IEEE/ASME Trans. on Mechatronics* , vol. 3, no.1, pp. 34-42, March 1998.

J69. M.D. Berkemeier and R.S. Fearing, ''Determining the Axis of a Surface of Revolution Using Tactile Sensing'', *IEEE Trans. on Pattern Analysis and Machine Intelligence*, vol. 15, no. 10, pp. 1079-1087, Oct. 1993.

J70. K.S.J. Pister, M.W. Judy, S.R. Burgett, and R.S. Fearing, ''Microfabricated Hinges'', *Sensors and Actuators A*, vol. 33, pp. 249-256, 1992.

J71. R.S. Fearing and T.O. Binford, ''Using a Cylindrical Tactile Sensor for Determining Curvature," *IEEE Trans. on Robotics and Automation*, Dec. 1991.

J72. R.S. Fearing, ''Tactile Sensing Mechanisms'', *Int. Journal of Robotics Research*, vol. 9, no. 3, June 1990.

J73. R.S. Fearing, ''Simplified Grasping and Manipulation with Dextrous Robot Hands'', *IEEE Journal of Robotics and Automation* Vol RA-2, No.4, December 1986.

J74. R.S. Fearing and J.M. Hollerbach, ''Basic Solid Mechanics for Tactile Sensing," *Int. Journal of Robotics Research*, vol. 4, no. 3, Fall 1985.

Invited Papers

I1. R.S. Fearing, ''Challenges for Effective Millirobots," *IEEE Int. Symp. on. Micro-NanoMechatronics and Human Science,* Nagoya Japan Nov. 5-8, 2006.

I2. R.S. Fearing, R. Sahai, and A. Hoover, ''Rapidly Prototyping Millirobots using Toolkits and Microassembly," The IARP - IEEE/RAS - EURON Joint Workshop on Micro and Nano Robotics, Paris, France, 23 - 24 October 2006.

I3. J. Yan, S. Avadhanula, M. Sitti, R.J. Wood, and R.S. Fearing, ''Thorax Design and Wing Control for a Micromechanical Flying Insect," *Proc. of 39th Annual Allerton Conf on Communication, Control and*

Computing, Monticello, IL, Oct 3-5, 2001.

I4. R. Fearing, ''Towards Micromechanical Flyers'' *The Bridge,* (quarterly for NAE members), vol. 31, no. 4, Winter 2001.

I5. R.S. Fearing, ''A Planar Milli-Robot System on an Air Bearing'', in *Robotics Research the 7th International Symposium,* edited by G. Giralt and G. Hirzinger, pp. 570-581, London: Springer-Verlag 1996.

I6. R.S. Fearing, ''A Miniature Mobile Platform on an Air Bearing'', *Third Intern. Symp. on Micro Machine and Human Science,* Oct 14-16, 1992, Nagoya, Japan.

Refereed Conference Papers

C1. Anusha Nagabandi*, Ignasi Clavera*, Simin Liu, Ronald Fearing, Pieter Abbeel, Sergey Levine, and Chelsea Finn, ''Learning to Adapt in Dynamic, Real-World Environments through Meta-Reinforcement Learning,'' *7th Int. Conf. on Learning Representations*, New Orleans, May 6-9, 2019.

C2. D.L. McPherson and R.S. Fearing, ''Team-based Robot Righting via Pushing and Shell Design,'' *IEEE Int. Conf. on Robotics and Automation,* Montreal, May 20-24, 2019.

C3. J.K.Yim, E.K. Wang, and R.S. Fearing, ''Drift-Free Roll and Pitch Estimation for High-Acceleration Hopping,'' *IEEE Int. Conf. on Robotics and Automation,* Montreal, May 20-24, 2019.

C4. Liyu Wang, Yuxiang Yang, Gustavo Correa, K. Karydis, R.S. Fearing, ''OpenRoACH: A Durable Open-Source Hexapedal Platform with Onboard Robot Operating System (ROS),'' *IEEE Int. Conf. on Robotics and Automation,* Montreal, May 20-24, 2019.

C5. Liyu Wang and Ronald S. Fearing, ''Automatic Leg Regeneration for Robot Mobility Recovery,'' *IEEE Int. Conf. on Robotics and Automation,* Montreal, May 20-24, 2019.

C6. M. Plecnik, K.M. Fearing, R.S. Fearing, ''Adjustable Power Modulation for a Leg Mechanism Suitable for Running,'' *IEEE Int. Conf. on Robotics and Automation,* Montreal, May 20-24, 2019.

C7. Can Koc, Cem Koc, Brian Su, C. S. Casarez and R. S. Fearing, ''Body Lift and Drag for a Legged Millirobot in Compliant Beam Environment,'' *IEEE Int. Conf. on Robotics and Automation,* Montreal, May 20-24, 2019.

C8. Justin K. Yim and Ronald Fearing, ''Precision Jumping Limits in Salto-1P from Flight-phase Control,'' *IEEE/RSJ Int. Conf. on Robots and Systems,* Madrid, Oct. 1-5, 2018.

C9. A. Nagabandi, G. Yang,T.H. Asmar, G. Kahn, S. Levine, and R.S. Fearing, ''Learning Image-Conditioned Dynamics Models for Control of Under-actuated Legged Millirobots,'' *IEEE/RSJ Int. Conf. on Robots and Systems,* Madrid, Oct. 1-5, 2018.

C10. Carlos Casarez, Ronald Fearing, ''Steering of an Underactuated Legged Robot through Terrain Contact with an Active Tail,'' *IEEE/RSJ Int. Conf. on Robots and Systems,* Madrid, Oct. 1-5, 2018.

C11. Benjamin McInroe, Carolyn Chen, Ken Goldberg, Ruzena Bajcsy, Ronald Fearing ''Towards a Soft Fingertip with Integrated Sensing and Actuation,'' *IEEE/RSJ Int. Conf. on Robots and Systems,* Madrid, Oct. 1-5, 2018.

C12. E.W. Schaler, L. Jiang, C.Lee, and R.S.Fearing, ''Bidirectional, thin-film repulsive-/attractive-force electrostatic actuators for a crawling milli-robot,'' *MARSS 2018: Int. Conf. on Manipulation, Automation, and Robotics at Small Scales,* Nagoya July 4-8, 2018.

C13. E.W. Schaler, L. Jiang, and R.S. Fearing, ''Multi-Layer, Thin-Film Repulsive-Force Electrostatic Actuators for a 2-DoF Micro-Mirror,'' Actuator 2018: Int. Conf. and Exhibition on New Actuators and Drive Systems, Bremen, June 25-27, 2018.

C14. J.S. Lee, M. Plecnik, J. Yang, R.S. Fearing, ‘‘Self-Engaging Spined Gripper with Dynamic Penetration and Release for Steep Jumps,’’ *IEEE Int. Conf. on Robotics and Automation,* Brisbane May 2018.

C15. A. Nagabandi, G. Kahn, R. Fearing, S. Levine, ‘‘Neural Network Dynamics for Model-Based Deep Reinforcement Learning with Model-Free Fine-Tuning,’’ *IEEE Int. Conf. on Robotics and Automation,* Brisbane May 2018.

C16. D.W. Haldane, J.K. Yim, R.S. Fearing, ‘‘Repetitive extreme-acceleration (14-g) spatial jumping with Salto-1P’’, *IEEE/RSJ Int. Conf. on Int. Robots and Systems,* Vancouver, Sep. 2017.

C17. C.S. Casarez and R.S. Fearing ‘‘Dynamic Terrestrial Self-Righting with a Minimal Tail,’’ *IEEE/RSJ Int. Conf. on Int. Robots and Systems,* Vancouver, Sep. 2017.

C18. M. M. Plecnik and R.S. Fearing, ‘‘A Study on Finding Finite Roots for Kinematic Synthesis,’’ *ASME 2017 Int. Design Eng. Tech. Conf.* Paper Number: DETC2017-68341, August 2017, Cleveland Ohio,

C19. Brian Nemsick, Austin D Buchan, Anusha Nagabandi, Ronald Fearing, Avideh Zakhor, ‘‘Cooperative Inchworm Localization with a Low Cost Team,’’ *IEEE Int. Conf. on Robotics and Automation,* Singapore May 2017.

C20. TaeWon Seo, Carlos Casarez, Ronald Fearing ‘‘High-rate controlled turning with a pair of miniature legged robots,’’ *IEEE Int. Conf. on Robotics and Automation,* Singapore May 2017.

C21. J.T. Karras, C.L. Fuller, K.C. Carpenter, A. Buscicchio, D. McKeeby, C.J. Norman, C.E. Parcheta, I. Davydychev, R.S. Fearing, ‘‘Pop-up Mars Rover with Textile-Enhanced Rigid-Flex PCB Body,’’ *IEEE Int. Conf. on Robotics and Automation,* Singapore May 2017.

C22. Cameron Rose, Parsa Mahmoudieh, Ronald Fearing, ‘‘Modeling and Control of an Ornithopter for Diving,’’ *IEEE/RSJ Int. Conf. on Intelligent Robotics and Systems,* Daejon, Korea 2016.

C23. Duncan Haldane, Mark Plecnik, Justin K. Yim, Ronald Fearing ‘‘A power modulating leg mechanism for monopedal hopping,’’ *IEEE/RSJ Int. Conf. on Intelligent Robotics and Systems,* Daejon, Korea 2016.

C24. Chen Li, Chad C. Kessens, Austin Young, Ronald Fearing, Robert Full, Cockroach-inspired robot reveals principles of ground-based, dynamic self-righting, *IEEE/RSJ Int. Conf. on Intelligent Robotics and Systems,* Daejon, Korea 2016.

C25. Anusha Nagabandi, Liyu Wang, Ronald Fearing, ‘‘A Path Planning Algorithm for Single-Ended Continuous Planar Robotic Ribbon Folding’’ *IEEE/RSJ Int. Conf. on Intelligent Robotics and Systems,* Daejon, Korea 2016.

C26. J.S. Lee, R.S. Fearing, and K-J. Cho, ‘‘Compound Foot for Increased Millirobot Jumping Ability,’’ *The 19th International Conference on Climbing and Walking Robots CLAWAR 2016,* London, UK, 12-14 September 2016.

C27. M. M. Plecnik and R.S. Fearing, Finding only Finite Roots to Large Kinematic Synthesis Systems ASME Int. Design Engineering Technical Conference, IDETC 2016, Charlotte, North Carolina, Aug. 21-24, 2016.

C28. Carlos Casarez and R.S. Fearing, ‘‘Step Climbing Cooperation Primitives for Legged Robots with a Reversible Connection,’’ *IEEE Int. Conf. Robotics and Automation*, Stockholm, May 2016.

C29. Gwang-Pil Jung, Carlos Casarez, Sunpill Jung, Ronald Fearing, Kyu-Jin Cho* ‘‘An Integrated Jumping-Crawling Robot Using Height-Adjustable Jumping Module,’’ *IEEE Int. Conf. Robotics and Automation,* Stockholm, May 2016.

C30. Liyu Wang, Mark Plecnik, Ronald S. Fearing, ‘‘Robotic Folding of 2D and 3D Structures from a Ribbon,’’ *IEEE Int. Conf. Robotics and Automation,* Stockholm, May 2016.

C31. J.D. Goldberg and R.S. Fearing, ‘‘Force Sensing Shell using Planar Sensor for a Miniature Legged Robot,’’ *IEEE/RSJ Int. Conf. on Intelligent Robots and Systems,* Hamburg Germany, Sept. 28 - Oct. 2, 2015.

C32. Dongwon Yun and R.S. Fearing, ‘‘VLR : Cockroach Millirobot with Load Decoupling Structure’’ *IEEE/ASME Int. Conf. on Advanced Intelligent Mechatronics,* Busan Korea, July 7-11, 2015.

C33. Jessica S. Lee and Ronald S. Fearing, ‘‘Anisotropic Collapsible Leg Spines for Increased Millirobot Traction,’’ *IEEE Int. Conf. on Robotics and Automation,* Seattle, WA May 2015.

C34. Duncan W. Haldane and Ronald S. Fearing, ‘‘Running beyond the bio-inspired regime,’’ *IEEE Int. Conf. on Robotics and Automation,* Seattle, WA May 2015.

C35. Cameron J. Rose, Parsa Mahmoudieh, and Ronald S. Fearing, ‘‘Coordinated Launching of an Ornithopter with a Hexapedal Robot,’’ *IEEE Int. Conf. on Robotics and Automation,* Seattle, WA May 2015.

C36. D. Zarrouk, D. W. Haldane, and R.S. Fearing, ‘‘Dynamic Legged Locomotion for Palm-Size Robots,’’ SPIE DSS 2015, Conf. 9467, Baltimore MD, April 2015.

C37. Konstantinos Karydis, David Zarrouk, Ioannis Poulakakis, Ronald Fearing, and Herbert G. Tanner, ‘‘Planning with the STAR(s) ,’’ *IEEE/RSJ Int. Conf. on Intelligent Robots and Systems,* Chicago, IL Sept. 2014.

C38. D. Zarrouk, A. Pullin, and R.S. Fearing, ‘‘Locomotion of in-plane robot with continuously sliding feet,’’ CLAWAR 2014, Proceedings of the 17th Int. Conf. on Climbing and Walking Robots and the Support Technologies for Mobile Machines, Poznan, Poland, 21-23 July 2014.

C39. Duncan Haldane, Peter Fankhauser, Roland Siegwart, Ronald Fearing, ‘‘Detection of Slippery Terrain with a Heterogeneous Team of Legged Robots,’’ *IEEE Int. Conf. Robotics and Automation,* Hong Kong, June 2014.

C40. Duncan Haldane, Ronald Fearing, ‘‘Roll oscillation modulated turning in dynamic millirobots’’ *IEEE Int. Conf. Robotics and Automation,* Hong Kong, June 2014.

C41. Cameron Rose, Ronald Fearing, ‘‘Comparison of Ornithopter Wind Tunnel Force Measurements with Free Flight,’’ *IEEE Int. Conf. Robotics and Automation,* Hong Kong June 2014.

C42. D. Haldane, A.D. Buchan, R.S. Fearing, ‘‘Automatic Identification of Dynamic Piecewise Affine Linear Models for a Running Robot,’’ *IEEE/RSJ Int.Conf. on Intelligent Robots,* Tokyo, Nov. 2013.

C43. N.J. Kohut, D., K.C. Peterson, R.S. Fearing ‘‘Aerodynamic Steering of a 10 cm High-Speed Running Robot,’’ *IEEE/RSJ Int.Conf. on Intelligent Robots,* Tokyo, Nov. 2013.

C44. N.J. Kohut, A.O. Pullin, D.W. Haldane, D. Zarrouk, and R.S. Fearing, ‘‘Precise Dynamic Turning of a 10 Cm Legged Robot on a Low Friction Surface Using a Tail,’’ *IEEE Int. Conf. on Robotics and Automation,* Karlsruhe, Germany May 6-10, 2013.

C45. D.W. Haldane, K.C. Peterson, F.L. Garcia Bermudez, and R.S. Fearing, ‘‘Animal-inspired Design and Aerodynamic Stabilization of a Hexapedal Millirobot,’’ *IEEE Int. Conf. on Robotics and Automation,* Karlsruhe, Germany May 6-10, 2013.

C46. D. Zarrouk, A.O. Pullin, N.J. Kohut, and R.S. Fearing ‘‘Sprawl Tuned Dynamic Hexapod’’ *IEEE Int. Conf. on Robotics and Automation,* Karlsruhe, Germany May 6-10, 2013.

C47. D. Zarrouk and R.S. Fearing, ‘‘Cost of Locomotion of a Dynamic Hexapedal Robot,’’ *IEEE Int.*

Conf. on Robotics and Automation, Karlsruhe, Germany May 6-10, 2013.

C48. Ryan Julian, Cameron Rose, Humphrey Hu, Ronald Fearing, "Cooperative Control for Window Traversal with an Ornithopter MAV and Lightweight Ground Station", The Twelfth International Conference on Autonomous Agents and Multiagent Systems (AAMAS2013) Minneapolis, MN May 6-10, 2013

C49. D. Zarrouk and R.S. Fearing, ‘‘Compliance-Based Dynamic Steering for Hexapods,’’ IEEE/RSJ Int. Robots and Systems, Vilamoura, Portugal Oct. 7-11, 2012.

C50. P. Birkmeyer, A.G. Gillies, and R.S. Fearing, ‘‘Dynamic Climbing of Near-Vertical Smooth Surfaces,’’ IEEE/RSJ Int. Robots and Systems, Vilamoura, Portugal Oct. 7-11, 2012.

C51. J.T. Karras, D.W. Haldane, and R.S. Fearing, ‘‘Rapid-Manufacturable Hair Sensor Array for Legged Millirobots,’’ IEEE/RSJ Int. Robots and Systems, Vilamoura, Portugal Oct. 7-11, 2012.

C52. A.D. Buchan, J. Bachrach, R.S. Fearing, ‘‘Towards a Minimal Architecture for a Printable, Modular, and Robust Sensing Skin,’’ IEEE/RSJ Int. Robots and Systems, Vilamoura, Portugal Oct. 7-11, 2012.

C53. F.L. Garcia Bermudez, R.C. Julian, D.W. Haldane, P. Abbeel, R.S. Fearing, ‘‘Performance analysis and terrain classification for a legged robot over rough terrain,’’ IEEE/RSJ Int. Robots and Systems, Vilamoura, Portugal Oct. 7-11, 2012.

C54. A. Mathis, J. Russell, T. Moore, J. Cohen, B. Satterfield, N.J. Kohut, X-Y. Fu, and R.S. Fearing, ‘‘Autonomous Navigation of a 5 Gram Crawling Millirobot in a Complex Environment,’’ CLAWAR 2012, Baltimore July 23-26, 2012.

C55. N.J. Kohut, D.W. Haldane, D. Zarrouk, and R.S. Fearing, ‘‘Effect of inertial tail on yaw rate of 45 gram legged robot,’’ CLAWAR 2012, Baltimore July 23-26, 2012.

C56. F. Quan, T. Zhang, C. Li, P. Maserati, A.M. Hoover, P. Birkmeyer, A. Pullin, R.S. Fearing, and D.I. Goldman, ‘‘Walking and running on yielding and fluidizing ground’’ Robotics Systems and Science, Sydney Australia July 9-13, 2012. (best student paper)

C57. A.O. Pullin, N.J. Kohut, D. Zarrouk, and R. S. Fearing, ‘‘Dynamic turning of 13 cm robot comparing tail and differential drive,’’ IEEE Int. Conf. Robotics and Automation, Minneapolis MN May 2012.

C58. Nicholas J. Kohut, Paul M. Birkmeyer, Kevin C. Peterson, Ronald S. Fearing, ‘‘Maneuverability and Mobility in Palm-Sized Legged Robots,’’ Unmanned Systems Technology XIV Available in print as Proceedings of SPIE Volume 8387 Dates: Wednesday-Friday 25 - 27 April 2012.

C59. K.C. Peterson and R.S. Fearing, ‘‘Experimental Dynamics of Wing Assisted Running for a Bipedal Ornithopter,’’ IEEE Int. Conf. Intelligent Robots and Systems, San Francisco, Sept. 2011.

C60. P. Birkmeyer, A. G. Gillies, and R. S. Fearing, ‘‘CLASH: Climbing Vertical Loose Cloth,’’ IEEE Int. Conf. Intelligent Robots and Systems, San Francisco, Sept. 2011.

C61. Stanley S. Baek, Fernando L. Garcia Bermudez, and Ronald S. Fearing ‘‘Flight Control for Target Seeking by 13 gram Ornithopter’’ IEEE Int. Conf. Intelligent Robots and Systems, San Francisco, Sept. 2011.

C62. N.J. Kohut, A.M. Hoover, K.Y. Ma, S.S. Baek, and R.S. Fearing, ‘‘MEDIC: A Legged Millirobot Utilizing Novel Obstacle Traversal,’’ IEEE Int. Conf. Robotics and Automation, Shanghai May 2011.

C63. S. Baek and R.S. Fearing, ‘‘Flight forces and altitude regulation of 12 gram i-Bird,’’ IEEE BioRob, Tokyo Sept. 2010.

C64. Aaron M. Hoover, Samuel Burden, Xiao-Yu Fu, S. Shankar Sastry, and R. S. Fearing, ‘‘Bio-inspired design and dynamic maneuverability of a minimally actuated six-legged robot’’ IEEE BioRob, Tokyo Sept. 2010.

C65. C. Li, A. M. Hoover, P. Birkmeyer, P.B. Umbanhowar, R.S. Fearing, and D.I. Goldman, ‘‘Systematic study of the performance of small robots on controlled laboratory substrates’’ Micro Autonomous Systems & Technology at SPIE’s Defense, Security, and Sensing Conference, Orlando, FL April 2010.

C66. P. Birkmeyer, K. Peterson, and R.S. Fearing ‘‘DASH: A Dynamic 15g Hexapedal Robot,’’ IEEE Int. Conf. Intelligent Robots and Systems, St. Louis, MO Oct. 2009.

C67. S.S. Baek, K.Y. Ma, R.S. Fearing, ‘‘Efficient Resonant Drive of Flapping Wing Robots’’ IEEE Int. Conf. Intelligent Robots and Systems, St. Louis, MO Oct. 2009.

C68. F.G. Bermudez and Ronald S. Fearing, ‘‘Optical Flow on a Flapping Wing Robot,’’ IEEE Int. Conf. Intelligent Robots and Systems, St. Louis, MO Oct. 2009.

C69. A.M. Hoover and R.S. Fearing ‘‘Analysis of off-axis performance of compliant mechanisms with applications to mobile millirobots,’’ IEEE Int. Conf. Intelligent Robots and Systems, St. Louis, MO Oct. 2009.

C70. J.S. Humbert. I. Chopra, R.S. Fearing, R. J. Full, R. J. Wood, and M.H. Dickinson, ‘‘Development of micromechanics for micro-autonomous systems (ARL-MAST CTA Program,’’) Proc. SPIE, Vol. 7318, 73180L (2009); DOI:10.1117/12.820881

C71. M. Teodorescu, C. Majidi, H. Rahnejat, and R.S. Fearing, ‘‘Effect of surface roughness on adhesion and friction of microfibers in side contact,’’ Proc. of the STLE/ASME Int. Joint. Tribology Conf. Oct. 20-22, 2008 Miami FL.

C72. A.M. Hoover, E. Steltz, and R.S. Fearing, ‘‘RoACH: An autonomous 2.4g crawling hexapod robot,’’ IEEE Int. Conf. on Intelligent Robots and Systems, Nice France Sept. 2008.

C73. A.M. Hoover and R.S. Fearing, ‘‘A Fast Scale Prototyping Process for Folded Millirobots,’’ IEEE Int. Conf. Robotics and Automation Pasadena, May 2008.

C74. M.P. Reyes and R.S. Fearing, ‘‘Macromodel for the Mechanics of Gecko Hair Adhesion,’’ IEEE Int. Conf. Robotics and Automation Pasadena, May 2008.

C75. C. Majidi and R.S. Fearing, ‘‘Mechanics of a novel shear-activated microfiber array adhesive,’’ Mater. Res. Soc. Symp. Proc. Vol. 1086-U01-11, 2008.

C76. E. Steltz and R.S. Fearing, ‘‘Dynamometer Power Output Measurements of Piezoelectric Actuators’’ IEEE Int. Conf. on Intelligent Robots and Systems, San Diego, CA Oct. 2007.

C77. E. Steltz, S. Avadhanula and R.S. Fearing, ‘‘High Lift Force with 275 Hz Wing Beat in MFI’’ IEEE Int. Conf. on Intelligent Robots and Systems, San Diego, CA Oct. 2007.

C78. A. Hoover and R.S. Fearing, ‘‘Rapidly Prototyped Orthotweezers for Automated Microassembly,’’ IEEE Int. Conf. on Robotics and Automation, Rome Italy, April 9-13, 2007.

C79. E. Steltz, M. Seeman, S. Avadhanula, and R.S. Fearing, ‘‘Power Electronics Design Choice for Piezoelectric Microrobots’’, IEEE Int. Conf. on Intelligent Robots and Systems, Beijing, China Oct.9-13, 2006.

C80. A. Hoover and R.S. Fearing, ‘‘A Rapidly Prototyped 2-Axis Positioning Stage for Microassembly using Large Displacement Compliant Mechanisms,’’ IEEE Int. Conf. on Robotics and Automation, Orlando, FL May 15-19, 2006.

C81. R. Sahai, R.E. Groff, E. Steltz, M. Seeman, and R.S. Fearing, ‘‘Towards a 3g Crawling Robot through the Integration of Microrobot Technologies,’’ IEEE Int. Conf. on Robotics and Automation, Orlando, FL May 15-19, 2006.

C82. R.J. Wood, S. Avadhanula, E. Steltz, M. Seeman, J. Entwistle, A. Bachrach, G. Barrows, S. Sanders,

and R.S. Fearing, ‘‘Design, Fabrication and Initial Results of a 2g Autonomous Glider,’’ 31st Annual Conference, IEEE Industrial Electronics Society 2005 Meeting, Raleigh North Carolina, Nov. 6-10, 2005.

C83. R.J. Wood, E. Steltz, and R.S. Fearing, ‘‘Nonlinear Performance Limits for High Energy Density Piezoelectric Bending Actuators,’’ IEEE Int. Conf. on Robotics and Automation, Barcelona, April 2005.

C84. S. Avadhanula and R.S. Fearing, ‘‘Flexure Design Rules for Carbon Fiber Microrobotic Mechanisms,’’ IEEE Int. Conf. on Robotics and Automation, Barcelona, April 2005.

C85. E. Steltz, S. Avadhanula, R.J. Wood, and R.S. Fearing, ‘‘Characterization of the Micromechanical Flying Insect by Optical Position Sensing,’’ IEEE Int. Conf. on Robotics and Automation, Barcelona, April 2005.

C86. R. Sahai, E. Steltz, and R.S. Fearing, ‘‘Carbon Fiber Components with Integrated Wiring for Millirobot Prototyping,’’ IEEE Int. Conf. on Robotics and Automation, Barcelona, April 2005.

C87. K. Autumn, M. Buehler, M. Cutkosky, R. Fearing, R.J. Full, D. Goldman, R. Groff, W. Provancher, A. A. Rizzi, U. Sarani, A. Saunders, and D.E. Koditschek, ‘‘Robotics in Scansorial Environments,’’ 2005 SPIE Security and Defense Symposium, Unmanned Ground Vehicle Technology VII Conference, Conference 5804, OR05-OR43-73, March 29-31, 2005.

C88. C. Majidi, R. Groff, and R. Fearing, ‘‘Clumping and Packing of Nanohairs Manufactured by Nanocasting’’ 2004 ASME Int. Mechanical Engineering Congress and Exposition. IMECE2004-62142, Anaheim, CA Nov. 13-19, 2004.

C89. S. Avadhanula, R. J. Wood, E. Steltz, J. Yan and R. S. Fearing ‘‘Lift Force Improvements for the Micromechanical Flying Insect’’ IEEE Int. Conf. on Intelligent Robots and Systems, Oct 28-30, 2003, Las Vegas NV.

C90. J. Yan and R.S. Fearing, ‘‘Wing Force Map Characterization and Simulation for the Micromechanical Flying Insect’’ IEEE Int. Conf. on Intelligent Robots and Systems, Oct 28-30, 2003, Las Vegas NV.

C91. R. Sahai, J. Lee, and R.S. Fearing, ‘‘Semi-Automated Micro Assembly for Rapid Prototyping of a One DOF Surgical Wrist,’’ IEEE Int. Conf. on Intelligent Robots and Systems, Oct 28-30, 2003, Las Vegas NV.

C92. M. Sitti and R.S. Fearing, ‘‘Synthetic Gecko Foot-Hair Micro/Nano Structures for Future Wall-Climbing Robots,’’ Int. Conf. Robotics and Automation 2003, pp. 1164-1170, Taipei, Taiwan, Sept. 2003.

C93. R.J. Wood, S. Avadhanula, M.Menon, and R.S. Fearing, ‘‘Microrobotics using Composite Materials: the Micromechanical Flying Insect Thorax,’’ IEEE Int. Conf. Robotics and Automation, pp. 1842-1849, Sept. 2003, Taipei, Taiwan.

C94. W.C. Wu, L. Schenato, R.J. Wood and R.S. Fearing, ‘‘Biomimetic Sensor Suite for Flight Control of a Micromechanical Flight Insect:Design and Experimental Results’’ IEEE Int. Conf. Robotics and Automation, pp. 1146-1151, Sept. 2003, Taipei, Taiwan.

C95. D. Campolo, R. Sahai, R. S. Fearing, ‘‘Development of Piezoelectric Bending Actuators with Embedded Piezoelectric Sensors for Micromechanical Flapping Mechanisms,’’ IEEE Int. Conf. Robotics and Automation, Sept. 2003, pp. 3339-3346, Taipei, Taiwan.

C96. D. Campolo, S.D. Jones and Ronald S. Fearing, ‘‘Fabrication of Gecko foot-hair like nano structures and adhesion to random rough surfaces,’’ IEEE Nano 2003 Aug 12-14, San Francisco.

C97. R. Sahai, J. Lee, and R.S. Fearing, ‘‘Towards Automatic Assembly of Sub-Centimeter Millirobot Structures,’’ *Third Int. Workshop on Microfactories,* Minneapolis, MN, Sept. 16-18, 2002.

C98. M. Sitti and R.S. Fearing, ‘‘Nanomolding Based Fabrication of Synthetic Gecko Foot-Hairs,’’ *IEEE*

Nano, August 2002, Washington, DC.

C99. W.C. Wu, R.J. Wood, R.S. Fearing, ‘‘Halteres for the Micromechanical Flying Insect,’’ *IEEE Int. Conf. on Robotics and Automation,* Washington, DC May 11-15, 2002.

C100. S. Avadhanula, R.J. Wood, D. Campolo, R. S. Fearing, ‘‘Dynamically tuned design of the MFI thorax’’ *IEEE Int. Conf. on Robotics and Automation,* Washington, DC May 11-15, 2002.

C101. M. Moll, K. Goldberg, M.A. Erdmann, and R. Fearing, ‘‘Orienting Micro-Scale Parts with Squeeze and roll Primitives,’’ *IEEE Int. Conf. on Robotics and Automation,* Washington, DC May 11-15, 2002.

C102. J.A. Thompson and R.S. Fearing, ‘‘Automating Microassembly with Ortho-tweezers and Force Sensing,’’ *IROS 2001,* Maui, HI, Oct. 29-Nov. 3, 2001.

C103. R.J. Wood and R.S. Fearing, ‘‘Flight Force Measurements for a Micromechanical Flying Insect,’’ *IROS 2001,* Maui, HI, Oct. 29-Nov. 3, 2001.

C104. J. Yan, R.J. Wood, S. Avadhanula, D. Campolo, M. Sitti and R.S. Fearing ‘‘Towards Flapping Wing Control for a Micromechanical Flying Insect’’, *IEEE Int. Conf. Robotics and Automation,* Seoul Korea, May 2001.

C105. M. Sitti, T. Su, R.S. Fearing, D. Campolo, J. Yan, D. Taylor, T. Sands, ‘‘Development of PZT/PZN-PT Unimorph Actuators for Micromechanical Flapping Mechanisms,’’ *IEEE Int. Conf. Robotics and Automation,* Seoul Korea, May 2001.

C106. E. Shimada, J.A. Thompson, J. Yan, R.J. Wood and R.S. Fearing, ‘‘Prototyping Millirobots using Dextrous Microassembly and Folding,’’ *Symposium on Microrobotics, 2000 ASME Int. Mechanical Engineering Congress and Exposition,* DSC-Vol. 69-2, pp. 933-940, Nov. 5-10, 2000, Orlando, FL.

C107. K. H. Chiang and R.S. Fearing, ‘‘A Hybrid Pneumatic/Electrostatic Milli-Actuator,’’ *2000 ASME International Mechanical Engineering Congress and Exposition,* vol. MEMS, Nov. 5-10, 2000, Orlando, FL.

C108. Y. Liang, K. Autumn, S.T. Hsia, W. Zesch, W.P. Chan, R.S. Fearing, R.J. Full, and T.W. Kenny, ‘‘Adhesion Force Measurements on Single Gecko Setae’’, *Technical Digest to the Solid-State Sensors and Actuators Workshop,* pp. 33-38, June 2000, Hilton Head SC.

C109. R.S. Fearing, K.H. Chiang, M. Dickinson, D.L. Pick, M. Sitti, and J. Yan, ‘‘Wing Transmission for a Micromechanical Flying Insect’’, *IEEE Int. Conf. on Robotics and Automation,* San Francisco, April 24-27, 2000.

C110. G. Moy, U. Singh, U., E. Tan, R.S. Fearing, ‘‘ Human tactile spatial sensitivity for tactile feedback,’’ *IEEE Int. Conf. on Robotics and Automation,* pp. 776-782, San Francisco, April 24-27, 2000.

C111. G. Moy, C. Wagner, and R.S. Fearing, ‘‘A Compliant Tactile Display for Teletaction’’, *IEEE Int. Conf. on Robotics and Automation,* San Francisco, April 24-27, 2000.

C112. J. Yan, P.K. Scott, and R.S. Fearing, ‘‘Inclusion Probing: Signal Detection and Haptic Playback of 2D FEM and Experimental Data’’, *Proc. ASME IMECE DSC-5 ’99* , Nashville, TN Nov. 14-19, 1999.

C113. W. Zesch and R.S. Fearing, ‘‘Alignment of Microparts Using Force Controlled Pushing,’’ *SPIE Conf. on Microrobotics and Micromanipulation,* Nov. 2-5 1998, Boston, MA, USA.

C114. G. Moy and R. Fearing, ‘‘Effects of Shear Stress in Teletaction and Human Perception’’, *Seventh Annual Symp. on Haptic Interfaces for Virtual Environment and Teleoperator Systems, ASME IMECE,* Anaheim, CA Nov. 1998.

C115. U. Singh and R. Fearing, ‘‘Tactile After-Images from Static Contact’’, *Seventh Annual Symp. on*

Haptic Interfaces for Virtual Environment and Teleoperator Systems, ASME IMECE, Anaheim, CA Nov. 1998.

C116. R.S. Fearing, G. Moy, and E. Tan, ''Some Basic Issues in Teletaction'', *IEEE Int. Conf. Robotics and Automation* , Albuquerque, NM April 1997.

C117. H. Furuichi and R.S. Fearing, ''A Planar Capacitive Micro Positioning Sensor'', *7th Int. Symp. on Micro Machine and Human Science,* pp. 85-90, Nagoya, Japan, Oct. 2-4, 1996.

C118. B. Gray and R.S. Fearing, ''A Surface Micromachined Microtactile Sensor Array'', *IEEE Int. Conf. Robotics and Automation* , Minneapolis, MN April 1996.

C119. R.S. Fearing, ''Survey of Sticking Effects for Micro-Parts'', *IEEE Int. Conf. Robotics and Intelligent Systems IROS '95*, Pittsburgh, PA August 7-9, 1995.

C120. E.J. Nicolson and R.S. Fearing, ''The Reliability of Curvature Estimates from Linear Elastic Tactile Sensors'', *IEEE Int. Conf. on Robotics and Automation*, Nagoya, Japan, May 1995.

C121. M.D. Berkemeier and R.S. Fearing ''Control Experiments on an Underactuated Robot with Application to Legged Locomotion'', *EEE Int. Conf. Robotics and Automation*, San Diego, CA May 10-12, 1994, pp. 149-154.

C122. E.J. Nicolson and R.S. Fearing, ''Sensing Capabilities of Linear Elastic Cylindrical Fingers'', *IEEE/RSJ Int. Conf. on Intelligent Robots and Systems*, Yokohama, Japan, July 1993.

C123. E.J. Nicolson and R.S. Fearing, ''Compliant Control of Threaded Fastener Insertion'', *IEEE Int. Conf. Robotics and Automation*, Atlanta, GA May 3-5, 1993.

C124. M.B. Cohn, M. Lam, and R.S. Fearing, ''Tactile Feedback for Teleoperation'', *SPIE Conf. 1833, Telemanipulator Technology,* Boston, MA, Nov. 15-16, 1992.

C125. S.R. Burgett, K.S.J. Pister, and R.S. Fearing, ''Three Dimensional Structures Made with Microfabricated Hinges'', *DSC-Vol. 40 Micromechanical Systems, ASME Winter Annual Meeting,* Anaheim, CA Nov. 8-13, 1992.

C126. M.D. Berkemeier and R.S. Fearing, ''Control of a Two-Link Robot to Achieve Sliding and Hopping Gaits'', *IEEE Int. Conf. on Robotics and Automation*, Nice France, May, 1992.

C127. E.J. Nicolson and R.S. Fearing, ''Dynamic Modelling of a Part Mating Problem: Threaded Fastener Insertion'', *IEEE Workshop on Intelligent Robots and Systems*, Osaka, Japan, Nov. 3-5, 1991.

C128. R.S. Fearing, ''Control of a Micro-Organism as a Prototype Micro-Robot'', *2nd Int. Symp. on Micromachines and Human Sciences*, Nagoya, Japan, Oct. 8-9, 1991.

C129. K.S.J. Pister, M.W. Judy, S.R. Burgett, and R.S. Fearing, ''Microfabricated Hinges: 1 mm Vertical Features with Surface Micromachining'', *IEEE Transducers '91*, San Francisco, CA June 1991.

C130. M.D. Berkemeier and R.S. Fearing, ''Determining the Axis of a Surface of Revolution Using Tactile Sensing'', *IEEE Int. Conf. on Robotics and Automation*, Cincinnati, OH May 1990.

C131. E.M. Sladek and R.S. Fearing, ''The Dynamic Response of a Tactile Sensor'', *IEEE Int. Conf. on Robotics and Automation,* Cincinnati, OH May 1990.

C132. K.S.J. Pister, R.S. Fearing, and R.T. Howe, ''A Planar Air Levitated Electrostatic Actuator System'', *IEEE Workshop on Micro Electro Mechanical Systems,* Napa Valley, CA Feb. 12-14 1990.

C133. S. Gopalswamy and R.S. Fearing, ''Grasping of Polyhedral Objects with Slip'', *IEEE Int. Conf. on Robotics and Automation,* Scottsdale AZ, May 1989.

C134. R.S. Fearing and T.O. Binford, ''Using a Cylindrical Tactile Sensor for Determining Curvature,''

IEEE Int. Conf. on Robotics and Automation, Philadelphia, PA, April 1988.

C135. R.S. Fearing, ‘‘Some Experiments with Tactile Sensing during Grasping,’’ *IEEE Int. Conf. on Robotics and Automation*, Raleigh, NC, April 1987.

C136. J.B. Chen, B.S. Armstrong, R.S. Fearing, J.W. Burdick, ‘‘Satyr and the Nymph: Software Archetype for Real Time Robotics’’, *IEEE-ACM Joint Computer Conference*, Dallas, TX November 1986.

C137. R.S. Fearing, A. Rise, and T.O. Binford, ‘‘A Tactile Sensing Finger Tip for a Dextrous Hand,’’ *SPIE Conference on Intelligent Robotics and Computer Vision,* Cambridge, MA October 1986.

C138. J.B. Chen, R.S. Fearing, B.S. Armstrong, and J.W. Burdick, ‘‘NYMPH: A Multiprocessor for Manipulation Applications’’, *IEEE Int. Conf. on Robotics and Automation,* San Francisco, CA April, 1986.

C139. R.S. Fearing ‘‘Implementing a Force Strategy for Object Re-orientation,’’ *IEEE Int. Conf. on Robotics and Automation,* San Francisco, CA April, 1986.

C140. R.S. Fearing, ‘‘Simplified Grasping and Manipulation with Dextrous Robot Hands’’, *Proceedings of the American Control Conference*, San Diego, CA, June 1984.

C141. R.S. Fearing and J.M. Hollerbach, ‘‘Basic Solid Mechanics for Tactile Sensing,’’ *IEEE Int. Conf. on Robotics and Automation*, Atlanta GA, March 1984.

Chapters in Books

[1] R.S. Fearing and R.J. Wood, ‘‘Challenges for 100 Milligram Flapping Flight,’’ *Flying Insect Robots,* edited by D. Floreano,M. Srinivasan, C. Ellington, and J-C. Zufferey, Springer-Verlag 2009.

[2] R. Fearing, S. Avadhanula, D. Campolo, M. Sitti, J. Yan, and R. Wood, ‘‘A Micromechanical Flying Insect Thorax’’, *Neurotechnology for Biomimetic Robots,* edited by J. Ayers, J.L. Davis and A. Rudolph, pp. 469-480, MIT Press, August 2002.

[3] K. Boehringer, R.Fearing, and K. Goldberg, ‘‘Microassembly’’, in *Handbook of Industrial Robotics* , edited by S. Y. Nof, Purdue University, p. 1045-1066, 2nd Ed., John Wiley & Sons, 1999.

[4] R.S. Fearing, ‘‘Micro-Actuators for Micro-Robots: Electric and Magnetic’’, in *Micromechanical Systems: Principles and Technology* , edited by T. Fukuda and W. Menz, Elsevier Science B.V.: Amsterdam 1998.

[5] R.S. Fearing, ‘‘Micro Structures and Micro Actuators for Implementing Sub-millimeter Robots’’, in *Precision Sensors, Actuators and Systems*, edited by H.S. Tzou and T. Fukuda, Kluwer Academic Publishers, Dordrecht The Netherlands, 1992.

[6] R.S. Fearing, ‘‘Planar Elasticity for Tactile Sensing’’, in *Tactile Sensing*, edited by H.R. Nicholls, pp. 75-93, World Scientific Publishing, Singapore, 1992.

[7] R.S. Fearing, ‘‘Basic Linear Elasticity’’, in *Tactile Sensing*, edited by H.R. Nicholls, pp. 277-290, World Scientific Publishing, Singapore, 1992.

[8] R.S. Fearing, ‘‘Tactile Sensing for Shape Interpretation’’, in *Dextrous Robot Hands*, edited by S.T. Venkataraman and T. Iberall, Springer-Verlag, New York: 1990.

Technical Reports

[1] M.D. Berkemeier and R.S. Fearing, ‘‘Determining the Axis of a Surface of Revolution Using Tactile Sensing’’, UCB/ERL Memorandum M89/117, October 1989.

[2] E.M. Sladek and R.S. Fearing, ‘‘The Dynamic Response of a Tactile Sensor’’, UCB/ERL Memorandum M89/138, December 1989.

[3] R.S. Fearing, ‘‘Simplified Grasping and Manipulation with Dextrous Robot Hands’’, MIT AI Memo 809, November 1984.

[4] R.S. Fearing and J.M. Hollerbach, ‘‘Basic Solid Mechanics for Tactile Sensing,’’ MIT AI Memo 771, March 1984.

[5] R.S. Fearing, ‘‘Exploration of the Dextrous Hand Control Problem’’, GE CR&D Technical Information Series Report 82CRD337, December 1982.

Other Papers

[1] David Zarrouk, Ronald Fearing ‘‘A One Actuator Steerable Autonomous Robot (1STAR),’’ video submission to IEEE Int. Conf. Robotics and Automation, 2014. (finalist for best conference video).

[2] Andrew G Gillies, Jonathan Puthoff, Michael J Cohen, Kellar Autumn, Ronald S Fearing, ‘‘Dry Self Cleaning Properties of Hard and Soft Fibrillar Surfaces,’’ NSF CMII Research and Innovation Conference, Atlanta, GA, Jan. 4-7, 2011.

[3] R.S. Fearing, S. Baek, P. Birkmeyer, K. Peterson, A. Hoover, J. Lee, and K. Ma, ‘‘Biomimetic Millirobots’’, IROS 2009 Workshop on Bioinspired Robots, St. Louis, MO Oct 2009.

[4] R.S. Fearing, A.M. Hoover, M. Hudson, ‘‘Enabling Low Cost Microassembly,’’ 2008 NSF NSF Design, Service, and Manufacturing Grantees and Research Conference, Jan. 3-6, 2008, Knoxville, TN.

[5] Matthew Spenko, Mark Cutkosky, Carmel Majidi, Ronald Fearing, Richard Groff, Kellar Autumn, ‘‘Foot design and integration for bioinspired climbing robots’’ SPIE 2006 Defense and Security Symposium.

[6] A.M. Hoover, R. Sahai, and R.S. Fearing, ‘‘Toward Low-Cost Automated Rapid Prototyping of Millirobots Using Kit Parts,’’ 2006 NSF Design, Service, and Manufacturing Grantees and Research Conference St. Louis, MO, Jul. 25-27 2006.

[7] R. Sahai, J.L. Kao, and R.S. Fearing, ‘‘Grasping Improvements in a Semi-Automated Procedure for the Rapid Prototyping of Millirobots,’’ 2005 NSF Design, Service, and Manufacturing Grantees and Research Conference, Jan. 3-6, 2005, Scottsdale, AZ.

[8] R. Sahai and R.S. Fearing, ‘‘Carbon Fiber Components with Integrated Wiring for Millirobot Prototyping,’’ 2005 NSF Design, Service, and Manufacturing Grantees and Research Conference, Jan. 3-6, 2005, Scottsdale, AZ.

[9] R. Sahai and R.S. Fearing, ‘‘Improvements to a Semi-Automated Procedure for Rapid Prototyping of Millirobots with Applications,’’ 2004 NSF Design, Service, and Manufacturing Grantees and Research Conference, Jan. 4-8, 2004, Dallas, TX.

[10] R. Sahai, J. Lee, and R.S. Fearing, ‘‘Towards Automatic Assembly of Sub-Centimeter Millirobot Structures’’ 2003 NSF Design, Service, and Manufacturing Grantees and Research Conference, Jan. 6-9, 2003, Birmingham, AL.

[11] Joe Yan, et al ‘‘The Micromechanical Flying Insect’’ video presentation: *IEEE Int. Conf. on Robotics and Automation,* Washington, DC May 11-15, 2002.

[12] R.S. Fearing, ‘‘Powering 3 Dimensional Microbots: Power Density Limitations’’, *Workshop WS5 on Micromechatronics and Micro Robotics, IEEE Int. Conf. on Robotics and Automation,* May 16-20, 1998, Leuven Belgium.

Abstracts

[1] C. Li, A. Pullin, D. Haldane, R. Fearing, and R. Full, ‘‘Shape-assisted body reorientation enhances trafficability through cluttered terrain,’’ 67th Annual Meeting, American Physical Society, Division of Fluid Dynamics, Nov. 2014, San Francisco.

[2] P. Birkmeyer, A. Gillies, R.S. Fearing, ‘‘Dynamic climbing of near-vertical surfaces with a legged robot’’ Society for Integrative and Comparative Biology (abstract), San Francisco, CA, Jan. 3-7, 2013.

[3] A. Gillies, H. Lin, A. Ren, K. Shiuan, R. Fearing, and R. Full, ‘‘Gecko toe and lamella adhesion on macroscopically rough surfaces,’’ Society for Integrative and Comparative Biology (abstract), San Francisco, CA, Jan. 3-7, 2013.

[4] D.W. Haldane and R.S. Fearing, ‘‘Using dynamic similarity scaling to inspire the design of a high-speed hexapedal millirobot,’’ Society for Integrative and Comparative Biology (abstract), San Francisco, CA, Jan. 3-7, 2013.

[5] N. Kohut, D. Zarrouk, A.O. Pullin, D.W. Haldane, and R.S. Fearing, ‘‘Rapid Terrestrial Turning in Robots Using Tails Inspired from Lizards.’’ Society for Integrative and Comparative Biology (abstract), San Francisco, CA, Jan. 3-7, 2013.

[6] K. Peterson, R. Dudley, and R.S. Fearing, ‘‘Hybrid aerial and terrestrial robots and their implications for avian flight evolution,’’ Society for Integrative and Comparative Biology (abstract), San Francisco, CA, Jan. 3-7, 2013.

[7] D. Zarrouk, A. Pullin and R.S. Fearing, ‘‘Locomotion Analysis of Dynamic in-Plane Hexapod,’’ Society for Integrative and Comparative Biology (abstract), San Francisco, CA, Jan. 3-7, 2013.

[8] Peterson K, Birkmeyer P, Dudley R, Fearing RS; ‘‘Wing Assisted Locomotion of a 25 g Running Robot’’ Society for Integrative and Comparative Biology (abstract), Salt Lake City, Utah, Jan. 3-7, 2011.

[9] Full RJ, Jayaram K, Mongeau JM, Birkmeyer P, Hoover A, Fearing RS; ‘‘Role of robustness in running: bio- and bio-inspired exoskeletons’’ Society for Integrative and Comparative Biology (abstract), Salt Lake City, Utah, Jan. 3-7, 2011.

[10] B. Geisler, A. Dittmore, B. Gallery, T. Stratton, R. Fearing,and K. Autumn, ‘‘Deformation of isolated gecko setal arrays: bending or buckling?’’ Society for Integrative and Comparative Biology, San Diego, Wed. Jan. 5, 2005.

[11] R. Fearing, ‘‘Biological inspiration for micro flight: The micromechanical flying insect,’’ 227th ACS National Meeting, Anaheim, CA, March 28-April 1, 2004. Division of Polymeric Materials: Science and Engineering SESSION: Interface of Polymers and Biomimetics

[12] R.J. Full, R. Fearing, and K. Autumn ‘‘Evolutionary Nanotechnology: Gecko Adhesive Mechanisms’’ 227th ACS National Meeting, Anaheim, CA, March 28-April 1, 2004. DIVISION: Division of Polymeric Materials: Science and Engineering SESSION: Interface of Polymers and Biomimetics

Patents

1. R.J. Full, R.S. Fearing, T.W. Kenny, and K. Autumn, ‘‘Adhesive Microstructure and Method of Forming Same’’ US patent 6,737,160 May 18, 2004.

2. R.S. Fearing and E. Shimada, ‘‘ Apparatus and method for manipulation of an object’’ US Patent 6,798,120 Sept. 28, 2004.

3. R. Fearing and M. Sitti. ‘‘An Improved Adhesive Microstructure and Method of Forming Same’’, US Patent 6,872,439 March 29, 2005.

4. R.J. Full, R.S. Fearing, T.W. Kenny, and K. Autumn, ‘‘Adhesive Microstructure and Method of Forming Same’’ US Patent 7,011,723 March 14, 2006.

5. S.D. Jones and R.S. Fearing, ‘‘Structure having nano-fibers on annular curved surface, method of making same and method of using same to adhere to a surface,’’ US Patent 7,175,723 Feb. 13, 2007.

6. R.J. Full, R.S. Fearing, T.W. Kenny, and K. Autumn, ‘‘Adhesive microstructure and method of forming same,’’ US Patent 7,229,685 June 12, 2007.

7. R.J. Wood, R.S. Fearing, J. Hickerson, ‘‘High performance piezoelectric actuator,’’ US Patent 7,368,860 May 6, 2008.

8. K. Autumn, R. Fearing, and S.D. Jones, ‘‘Fabricated adhesive microstructure for making an electrical connection,’’ US Patent 7,476,982 January 13, 2009.

9. R.S. Fearing and M. Sitti, ‘‘Adhesive microstructure and method of forming same,’’ US Patent 7,691,307 April 6, 2010.

10. C. Majidi, R.E. Groff, R.S. Fearing, and Steven D. Jones, ‘‘Compliant base to increase contact for micro- or nano-fibers,’’ US Patent 7,709,087, May 4, 2010.

11. C. Majidi, R.E. Groff, and R.S. Fearing, ‘‘Nanostructured friction enhancement using fabricated microstructure,’’ US Patent 7,799,423, Sep. 21, 2010.

12. R.J. Full, R.S. Fearing, T.W. Kenny, and K. Autumn, ‘‘Adhesive Microstructure and Method of Forming Same’’ US Patent 7,828,982, Nov. 9, 2010.

13. R. Fearing, A. Bachrach, R.E. Groff, and C. Majidi, ‘‘Actively switchable nano-structured adhesive,’’ US Patent 7,914,912, Mar. 30, 2011.

14. R. Fearing, R.J. Full, K. Autumn, Japanese patent 4830083.

15. C. Majidi, R. Groff, R.S. Fearing, ‘‘Symmetric, Spatular Attachments for enhanced adhesion of micro- and nano-fibers,’’ US Patent 8,309,201, Nov. 13, 2012.

16. K. Autumn, R.S. Fearing, and S.D. Jones, ‘‘Fabricated adhesive microstructures for making an electrical connection,’’ US Patent 8,610,290, Dec. 17, 2013.

17. R.F.Ross, R.S. Fearing, and B.G. Bush, ‘‘Synthetic gecko adhesive attachments’’ US Patent 8,703,267, April 22, 2014.

18. R. Fearing and K. Autumn, ‘‘Controlling Peel Strength of Micron-Scale Structures,’’ US Patent 8,815,385, Aug. 26, 2014.

19. E. Schaler and R.S. Fearing, ‘‘Repulsive-attractive-Force Electrostatic Actuator’’ US Patent 10,951,133, March. 16, 2021.

20. E. Schaler and R.S. Fearing, ‘‘Repulsive Force Electrostatic Actuator’’ US Patent 10,951,134, March. 16, 2021.

21. M. Plecnik, R. Fearing, D. Haldane, Justin Yim, ‘‘Series Elastic Power Modulation for Robotic Locomotion’’ US Patent 11,938,044, March 26, 2024.

Invited Talks

[1] ‘‘Agile Maneuver with Under-Actuated Millirobots,’’ MEAM Seminar, University of Pennsylvania, March 22, 2022.

‘‘SALTO Precision Leaping and Landing for Branch to Branch Jumping,’’ Bay Area Robotics Symposium, Oct. 29, 2021.

[2] ‘‘Learning to Design Real Robots with Domain Adaptation,’’ Berkeley Deep Drive Community Meeting, March 9, 2021.

[3] ‘‘Gecko-inspired Fibrillar Adhesion: a perspective on 20 years of progress’’ 44th Annual Meeting of the Adhesion Society, Feb. 24, 2021. (Keynote talk)

[4] ‘‘SALTO Precision Leaping and Landing Using Stance-phase Balance Control,’’ Bay Area Robotics Symposium Nov. 20, 2020.

[5] ‘‘2D Fabrication for 3D Milli-robots’’ IROS Workshop ‘‘Mechanisms and Design from Inception to Realization’’, Oct. 29, 2020.

[6] ‘‘Bioinspired Legged Millirobots,’’ IROS Tutorial Session Bioinspired Robots, Oct. 25, 2020.

[7] ‘‘Folded Bioinspired Millirobots: Prototypes and Performance,’’ Art+Nature Symposium, UC Berkeley, Nov 9-10, 2019.

[8] ‘‘Towards Dextrous Locomotion with Biomimetic Millirobots,’’ University of Southern California, 24, Oct. 2018.

[9] ‘‘Tails for Minimally-Actuated Milli-Robots,’’ Workshop on Unusual Appendages: novel, multimodal, or multi-functional uses for limbs, tails, and other body parts, RSS 2018, Pittsburgh, June 29, 2018.

[10] ‘‘Towards All-Terrain Locomotion with Milli-robots’’ BDD/BAIR Day, Berkeley, CA 29 Nov. 2017.

[11] ‘‘SALTO: Saltatorial Agile Locomotion on Terrain Obstacles’’ SF Bay Area Robotics Symposium, 17 Nov. 2017.

[12] ‘‘Folded Bioinspired Millirobots: Prototypes and Performance’’ Workshop on Folding in Robotics, IROS Vancouver, Sept. 28, 2017.

[13] ‘‘Towards Multirobot Dextrous Locomotion’’ SF Bay Area Robotics Symposium, Nov. 18, 2016.

[14] ‘‘Towards Dextrous Locomotion’’ Naval Air Weapons Station-China Lake, Ridgecrest, CA August 3, 2016.

[15] ‘‘Minimal Actuation in Legged Locomotion’’ Workshop on Minimality & Design Automation Robotics: Science and Systems Ann Arbor, Michigan June 2016.

[16] ‘‘Biomimetic Millirobots for Dynamic Ambulation’’ TUM Institute of Advanced Study Symposium on Micro-Nano-Mechatronics/Robotics, Munich 5 February 2016.

[17] ‘‘Towards Dextrous Locomotion’’ SF Bay Area Robotics Symposium, 23 Oct.2015.

[18] ‘‘Biomimetic Millirobots for Dynamic Ambulation,’’ Workshop on Robotics-Inspired Biology, IEEE Int. Conf. on Robotics and Automation, Seattle, WA, May 26, 2015.

[19] ‘‘Microgripping and Manipulation at UC Biomimetic Millisystems Lab,’’ Workshop on Bio-inspired innovations by Micro-Nano Robotics and Systems, IEEE Int. Conf. on Robotics and Automation, Seattle, WA, May 26, 2015.

[20] ‘‘Dynamic Locomotion with Millirobots’’ Stanford-Berkeley Robotics Symposium, Stanford Oct. 17, 2014

[21] ‘‘Contributions of Compliance and Shape to Locomotion and Manipulation,’’ Workshop on Advances on Soft Robotics, Robotics Science and Systems, Berkeley, CA July 13, 2014.

[22] ‘‘Biomimetic Millirobots for Dynamic Locomotion,’’ Center for Biomimetic Mechanical Systems Colloquium on Biomimetic Mechanical Systems Seoul National University, South Korea, July 11, 2014.

[23] ‘‘Micro/Nano Surface and Particle Grasping’’, Workshop on Frontier of Bioinspired Systems based on Micro-Nanorobotics, ICRA 2014, Hong Kong, May 31, 2014.

[24] ‘‘Biomimetic Millirobots’’ Workshop on Frontiers of Robotics and Autonomous Systems, HKUST, June 1, 2014

[25] ‘‘Biomimetic Millirobots’’ MIT, Mechanical Engineering Colloquium, Dec. 7, 2012

[26] ‘‘Biomimetic Millirobots’’ EPFL, Nov. 1, 2012

[27] ‘‘Biomimetic Millirobots’’ ETH Distinguished Lecture in Robotics, Systems, and Control series, Zurich, Nov. 16, 2012.

[28] ‘‘Biomimetic Millirobots’’ GCOE Symposium, Nagoya Japan, July 27, 2012.

[29] ‘‘Biomimetic Millirobots’’ Univ. of Toronto, Fri. Jan. 13, 2012

[30] ‘‘Biomimetic Millirobots’’ University of Maryland, Fri Oct. 7, 2011

[31] ‘‘Biologically Inspired Mobile Millirobots,’’ IROS 2011 Control and Future related technologies for robotic automation in micro/nano scale, San Francisco, Friday Sep. 30, 2011.

[32] ‘‘Biomimetic Millirobots’’ IROS 2011 Workshop Sep. 25, 2011.

[33] ‘‘Autonomous Indoor Ornithopter Flight,’’ ONR Micro Flyer Workshop, Arlington, VA May 18, 2011.

[34] ‘‘Micro/Nano Surface Grasping’’ IEEE ICRA Workshop on Micro-Nano Robotics and New Evolution. Anchorage, AK May 3, 2010.

[35] ‘‘Power and Energy for Small Robotic Systems,’’ Army Science Conference, Orlando, FL Dec. 2, 2010.

[36] ‘‘Biomimetic Millirobots’’ Carnegie Mellon University, Dec. 9, 2009.

[37] ‘‘Towards capable millirobots through folding and gripping,’’ Automation & Robotics Research Institute The University of Texas at Arlington, Nov. 10, 2009.

[38] ‘‘Biomimetic Millirobots’’ IROS2009 Workshop on Biologically-Inspired Robots, St. Louis, Oct. 11, 2009.

[39] ‘‘Gecko Inspired Synthetic Adhesives’’ Kimberly Clark, Atlanta, GA Dec. 15, 2008

[40] ‘‘Design, micro assembly, rapid prototyping of flying and crawling micro-robots’’ Makani Power, Alameda, CA Nov. 20, 2008

[41] ‘‘Gecko Technology Briefing,’’ Nike Corp. Portland, Oct. 30, 2008.

[42] ‘‘Gecko Inspired Synthetic Adhesives,’’ AS&T Colloquium, UC Berkeley, 29 Oct. 2008.

[43] ‘‘Biomimetic Principles for Insect-Scale Flapping Flight and Ambulation,’’ Int. Workshop on Biomimetic Complex System Design, KAIST, Daejon, Korea June 3-4, 2008.

[44] ‘‘Biomimetic Millirobots,’’ Michigan State University, March 27, 2008.

[45] ‘‘Challenges for 100 milligram flapping flight,’’ IROS Workshop on Micro Aerial Vehicles Design, Control, and Navigation, 2 Nov. 2007, San Diego.

[46] ‘‘Biomimetic Millirobots’’ RPI CS Day, Oct. 26, 2007

[47] ‘‘Challenges for 100 Milligram Flapping Flight’’ plenary talk, Flying Insect Robots, Acon, Switzerland, Aug. 13-17, 2007.

[48] ‘‘Challenges for Effective Millirobots,’’ plenary talk, IEEE MicroMachine and Human Sciences Symp. Nagoya, Japan Nov. 5, 6, 7. 2006.

[49] ‘‘Rapid Prototyping Millirobots using Toolkits and Microassembly,’’ Int. Adv. Robotics Programme, Paris, France Oct. 23-24, 2006.

[50] ‘‘Challenges for Effective Millirobots’’ Stanford Broad Area Colloquium for Artificial Intelligence, Geometry, Graphics, Robotics and Computer Vision, Oct. 9, 2006.

[51] ‘‘Fingers for Interactions in Micro and Nano World’’ ICRA Workshop on Role of Robotics Research in Micro and Nanotechnologies, Orlando, FL May 15, 2006.

[52] ‘‘Challenges for Effective Millirobots’’ plenary talk, IEEE Int. Conf. on Robotics and Automation May 18, 2006, Orlando, FL

[53] ‘‘Microrobots Using Composite Materials’’ 1st Workshop on Very Small Robots MITRE Corp., McLean, VA, 23-24 February 2005.

[54] ‘‘Mechanisms for 1 gram and 0.1 gram Autonomous Flyers’’ presentation to Board on Army Science and Technology, Washington, DC December 16-17, 2004.

[55] ‘‘Gecko Inspired Dry Adhesion: Principles of Operation’’, Gordon Research Conference on Adhesion Science. Tilton, NH, August 8-13, 2004.

[56] ‘‘Micromechanical Flying Insect,’’ ICRA Workshop on Micro Air Vehicles, New Orleans, April 2004.

[57] ‘‘Design and Fabrication of a Micromechanical Flying Insect’’, IGERT Seminar, Case Western Reserve, 23 March 2004.

[58] ‘‘Synthetic Gecko Foot-Hair Micro/Nano-Structures for Future Wall-Climbing Robots,’’ IROS Workshop on Nanoscience and Technoloy, Oct. 27, 2003, Las Vegas, NV.

[59] ‘‘Towards Automatic MicroAssembly of MilliRobots’’, IROS Workshop on Sensing and Manipulation of Micro and Nano Entities: Science, Engineering, and Applications, Oct. 27, 2003, Las Vegas, NV.

[60] ‘‘Design and Fabrication of Micromechanical Flying Insect,’’ Bioengineering Seminar, Caltech, 19 May 2003.

[61] ‘‘Towards Synthetic Biomimetic Adhesion,’’ Defense Sciences Review Council, San Francisco, 21 April 2003.

[62] ‘‘Towards Automatic MicroAssembly of MilliRobots’’ Zyvex Corp, Plano Texas, 15. Nov. 2002.

[63] ‘‘MilliRobotics for Manipulation, Remote Sensing and Presence,’’ Dept. of Computer Science and Engineering, Univ. of Minnesota, Minneapolis Nov. 4, 2002.

[64] ‘‘Compliant Fingers,Toes and Thoraxes for Versatile MilliRobots’’ Darpa Biodynotics Workshop, Arlington, VA, Oct. 7, 2002.

[65] ‘‘Towards Micromechanical Flyers,’’ NAE Frontiers in Engineering, Irvine, CA, Mar. 1-3, 2002.

[66] ‘‘Design and Fabrication of a Micromechanical Flying Insect’’ Grasp Lab Seminar, Univ. of Pennsylvania, Philadelphia, April 13, 2001.

[67] ‘‘Design and Construction of a Micromechanical Flying Insect’’ Xerox Summer Robotics Seminar, Xerox PARC, Palo Alto, CA July 25, 2000.

[68] ‘‘Micromechanical Flying Insect’’ Neurotechnology for Biomimetic Robots, Nahant, MA, May 14-16, 2000

[69] ‘‘Micromechanical Flying Insect’’ Workshop on Mobile Microrobotics, IEEE Int. Conf. Robotics and Automation, April 28, 2000

[70] ‘‘Alignment of Microparts Using Force Controlled Pushing’’, *Tutorial on Modeling and Control of Micro- and Nano-manipulation, IEEE Int. Conf. Robotics and Automation,* Detroit, MI May 11, 1999.

[71] ‘‘Powering 3 Dimensional Microbots: Power Density Limitations’’, *Workshop WS5 on Micromechatronics and Micro Robotics, IEEE Int. Conf. on Robotics and Automation,* May 16-20, 1998, Leuven Belgium.

[72] ‘‘MEMS for Tactile Sensing and Display’’, Workshop on Human and Machine Haptics, Asilomar, CA Dec. 8-9, 1997.

[73] ‘‘Micro-Actuators for Micro-Robots: Electric and Magnetic’’, *Tutorial Su 1: Micro Mechatronics, IEEE 1997 Int. Conf. on Robotics and Automation,*, Albuquerque, NM April 20, 1997.

[74] ‘‘Tele-taction’’, East Bay chapter, IEEE EMBS Nov. 15, 1995

[75] ‘‘Micro-Actuators for Micro-Robots’’ and ‘‘Micro-Sensors for Micro-Robots’’, *Tutorial on Micro-Robotic Principles and Applications, IEEE Int. Conf. Robotics and Automation,*, Nagoya, Japan, May 1995.

[76] ‘‘Tele-taction: remotely transmitting the sense of touch’’ Univ. of Wisconsin, Feb 22, 1995.

[77] ‘‘Grasping of Microparts in Air’’, *Tutorial on Micro Dextrous Motion Control, IEEE Int. Conf. Robotics and Automation,*, San Diego, CA, May 8, 1994.

[78] ‘‘Tele-taction’’, Robotics Colloquium, Univ. of Washington, Feb. 14, 1994.

[79] ‘‘Actuation for Micro-Robots’’, *Tutorial on Miniature and Micro Robotic Machines: Technology, Designs and Applications, IEEE Robotics and Automation,* Atlanta, GA, May 6, 1993.

[80] ‘‘Micro Structures and Micro Actuators for Implementing Sub-Millimeter Robots’’, *Workshop on Microtechnologies and Applications to Space Systems,* May 27-28, 1992, Jet Propulsion Laboratory, Pasadena, CA.

[81] ‘‘Micro Structures and Micro Actuators for Implementing Sub-Millimeter Robots’’, *Tutorial on High Precision Sensors/Actuators and Systems, IEEE Robotics and Automation,* Nice, France, May 11, 1992.

[82] ‘‘Intelligent Micro Sensors and Actuators’’, *Tutorial, IECON 1991,* Kobe, Japan, Oct. 28, 1991.

[83] ‘‘Control of Natural and Un-Natural Micro-Robots’’, Beckman Institute, U. Ill., May 2, 1991.

[84] ‘‘A Planar Air Levitated Electrostatic Manipulator System’’, *Workshop on Micro Electro Mechanical Systems, IEEE Int. Conf. on Robotics and Automation,* Cincinnati, OH, May 13, 1990.

[85] ‘‘Robotic Tactile Shape Interpretation’’, and ‘‘Grasping of Polyhedral Objects Using Slip’’, ONR Workshop on Dextrous Manipulation and Tele-Operation, Oxford, UK August 7-9, 1989.

[86] ‘‘Robotic Tactile Shape Interpretation’’, Autonomous Systems and Robotics Conference, Pasadena, CA, April 25-16, 1989.

Service as External Thesis Examiner

Slava G. Arabagi, PhD ME, CMU Sep. 2011 ‘‘A Miniature controllable flapping wing robot,’’

Liyu Wang, PhD ME, ETHZ May 5, 2014 ‘‘Shape Adaptation Through Soft-Matter Extended Phenotype Enhances Robots’ Functionality’’

Service to Community (K-14)

1. October 28, 2015 ‘‘Biologically Inspired Millirobots’’ Part of Bay Area Science Festival, Biorobots: Dissected, Swissnex San Francisco.

2. July 7, 2015 Talk on robotics to Education and Outreach for Community College summer interns.

3. March 27, 2015 Talk on ‘‘Biologically Inspired Milli-Robots’’ to Edison Tech Center, Schenectady, NY

4. April 29, 2012 Talk on ‘‘Engineering and Robotics’’ to High School Without Borders, Orinda, CA

5. April 23, 2011 Judging for Pioneers in Engineering contest for 12 local area high school teams (2-7 pm)

6. March 2010 - judging for Kids Science Challenge Biomimetic Designs

7. Summer 2009- helping Rashmi Nanjundaswamy put together fabrication of silicone rubber microhairs for LHS summer Nano Camp. Nanoscale Informal Science Education http://www.nisenet.org/catalog/programs/synthetic_gecko_tape_through_nanomolding

8. Aug. 21, 2009, filming for Kids Science Challenge and cardboard robot activity design, design of jumping robot activity which enables third to sixth graders to build a passive dynamic robot model which can jump when tossed.

9. Talk on ‘‘Biomimetic Millirobots’’ to Contra Costa Community College, Feb. 13, 2009.

10. June 25, 2008 PBS Dragon Fly TV episode, UC Berkeley (filming with Minnesota Public TV, and Prof. Bob Full)

11. National Youth Leadership Forum, TECH Seminar ‘‘Milli&Micro Robots’’ San Jose, July 28, 2004

Professional Service - Conference and Journals

IEEE Robotics and Automation Society Awards committee member 2018-19

Co-organizer with K. Karydis, L. Wang for RSS Workshop on Design and Control of Small Legged Robots, Pittsburgh, June 30, 2018.

Best paper awards committee, IEEE ICRA 2014, RSS 2018

Editorial board member, *Journal of Micro-Bio Robotics*, 2010-2020.

IROS 2012 - session co-chair (2)

Program committee member, IEEE Int. Conf. Robotics and Automation, 1995, 1998, 2000, 2001-2006.

Program committee member, IEEE Int. Conf. Intelligent Robotics and Systems, 2001-2006, 2009-2010.

co-editor with Prof. Aaron Dollar, Prof. Kyujin Cho, Prof. Yong-Lae Park of special issue of ASME Journal of Mechanisms and Robotics, Novel Approaches to Design and Manufacture of Fully-Integrated Robotic Mechanisms, Fall 2014.

co-editor with Prof. Kellar Autumn of special issue of Jnl. Adhesion Science and Technology, ‘‘Gecko Inspired Adhesion:Theoretical and Applied Aspects,’’ vol. 12-13, pp. 1119-1341, 2007.

Editorial Board Member, *Haptics-e*.

North American Editor-in-Chief, *Journal of Micromechatronics* , (VSP) 1998-2006.

Associate Editor for *Mechatronics*, (Pergamon Press) 1990-2005.

Reviewer for: NSF proposals, children's book for Scholastic, *IFAC 08, Journal Royal Society-Interface, PNAS, Langmuir, Bioinspiration and Biomimetics, Advanced Materials, IEEE Trans. on Robotics, IEEE Int. Conf. on Robotics and Automation, IEEE/RSJ Int. Conf. on Intelligent Robots and Systems, Int. Journal of Robotics Research, 5th Int. Conf. on Advanced Robotics, Journal of Robotic Systems, Int. Jnl. Intelligent Machines, Sensors and Actuators, IEEE Journal of Microelectromechanical Systems, ASME Annual Symposium on Haptic Interfaces for Virtual Environment, IEEE/ASME Trans. on Mechatronics, IEEE Trans. on Semiconductor Manufacturing, ASME Jnl. of Biomechanical Engineering, IEEE Journal of Solid-State Circuits.*

Secretary East Bay Chapter IEEE EMBS 9/95-6/96, vice-president 6/96-6/97.

Program committee member, American Association for Artificial Intelligence AAAI-90, March 1990.

Professional Service - Advisory Panels, Workshops

Workshop on Robotic Materials, Boulder, CO March 10-12, 2017.

Materials for Sustainable and Mission Flexible Intelligent Systems, Army Science Planning & Strategy Meeting Aberdeen MD, December 8-9, 2016.

CRA/CCC Workshop on Emerging Technologies and Trends in Robotics, Aug. 14-15, 2008, Snowbird, Utah.

MTO Workshop May 24-25, 2004.

presentation to NAE Board on Army Science and Technology, Washington, Dec. 16-17, 2004.

Defense Sciences Review Committee Workshop, April 21, 2003, San Francisico.

Panel Member NSF Sensitive Skin Workshop, Oct. 14-15, 1999, Washington DC

DARPA/ISAT Study Group: Cost Effective Configurable Robots, Arlington, VA April 5, 1996, Berkeley June 18, 1996, Pittsburgh, PA, July 23, 1996, Woods Hole, MA, Aug. 19-23, 1996.

Panel member: ''DARPA MEMS Infrastructure Workshop'', Millbrae, CA, Sept. 22-23, 1992.

Panel member: ''Workshop on Expanding Access to Japanese Robotics R&D'', National Academy of Sciences, Washington, DC May 1, 1992.

Panel member: ''NSF Workshop on Educational Use of Field Programmable Gate Arrays'', Washington, DC Jan. 7-8, 1990.

Secretary East Bay Chapter IEEE EMBS 9/95-6/96, vice-president 6/96-6/97.

Professional Service - Review Panels

NSF ERC review, Caltech Center for Neuromorphic Systems Engineering, Oct. 23-26, 2000, Pasadena, CA

Served on 5 NSF, 1 NIH review panels.