

CURRICULUM VITAE

MATTHEW SPENKO, PH.D.

Professor

The Robotics Lab@IIT

Mechanical, Materials, and Aerospace Engineering Department

Illinois Institute of Technology

10 W. 32nd St. RE-243 Chicago, IL 60616

mshenko@iit.edu | 617-510-1874 | <http://robots.iit.edu>

**Exhibit
2003**

01/23/2025

IPR2024-00850

Exotec Product France SAS et al v. Opex Corporation

Opex's Exhibit 2003

EX2003, Page 1

1 Education

Massachusetts Institute of Technology

Ph.D. Mechanical Engineering

Adviser: Prof. Steven Dubowsky

Thesis: Hazard Avoidance for High-Speed Rough-Terrain Unmanned Ground Vehicles

Cambridge, MA

June 2005

Massachusetts Institute of Technology

M.S. Mechanical Engineering

Adviser: Prof. Steven Dubowsky

Thesis: Design and Analysis of the SmartWalker, a Robotic Aid for the Elderly

Cambridge, MA

June 2001

Northwestern University

B.S. Mechanical Engineering *cum laude*

Evanston, IL

June 1999

2 Professional History

Illinois Institute of Technology

Professor of Mechanical and Aerospace Engineering

Associate Professor of Mechanical and Aerospace Engineering

Assistant Professor of Mechanical and Aerospace Engineering

Chicago, IL

2019–Present

2013–2019

2007–2013

Stanford University

Intelligence Community Post Doctoral Scholar

Center for Design Research, Department of Mechanical Engineering

Advisers: Prof. Mark Cutkosky and Al Rizzi (Carnegie Mellon University)

Stanford, CA

2005–2007

Massachusetts Institute of Technology

M.S. and Ph.D. Research Assistant, Department of Mechanical Engineering

Cambridge, MA

1999–2005

Motorola

Engineering Intern

Advanced Manufacturing Technology—Personal Communications Sector

Libertyville, IL

1998–1999

Northwestern University

Undergraduate Researcher, Department of Mechanical Engineering

Adviser: Prof. Siavash Sohrab

Evanston, IL

1997

Warner Electric Brake and Clutch

Mechanical Engineering Co-op

South Beloit, IL

1996

3 Publications

Citation numbers are found using scholar.google.com.

	All	Since 2019
Citations	6496	2999
h-index	32	25
i10-index	77	60

3.1 Journal Publications

- J-47 O. A. Hafez, M. Joerger, and M. Spenko. How safe is particle filtering-based localization for mobile robots? an integrity monitoring approach. *IEEE Transactions on Robotics*, 40:3372–3387, 2024
- J-46 Y. Chen, B. Pervan, and M. Spenko. Quantifying the risk of unmapped associations for mobile robot localization safety. *IEEE Transactions on Robotics*, 40:2920–2931, 2024
- J-45 K. Nagai, M. Spenko, R. Henderson, and B. Pervan. Fault-free integrity of urban driverless vehicle navigation with multi-sensor integration: A case study in downtown chicago. *NAVIGATION: Journal of the Institute of Navigation*, 71(1), 2024
- J-44 B. Saintyves, M. Spenko, and H. M. Jaeger. A self-organizing robotic aggregate using solid and liquid-like collective states. *Science Robotics*, 9(86):eadh4130, 2024
- J-43 D. Mulroy, E. Lopez, M. Spenko, and A. Srivastava. Using r-functions to control the shape of soft robots. *IEEE Robotics and Automation Letters*, 7(4):8598–8603, 2022
- J-42 C. H. Cannon, C. G. Borchetta, D. L. Anderson, G. Arellano, M. Barker, G. Charron, J. M. LaMontagne, J. H. Richards, E. Abercrombie, J. E. G. Andino, L. Banin, X. T. Casapia, X. Chen, P. Degtjarenko, J. Dell, D. Durden, R. Hernandez-Gutierrez, A. D. Hirons, C.-S. Kua, H. L. Vigne, M. Leponce, J. Y. Lim, M. D. Lowman, A. J. Marshall, S. T. Michaletz, B. B. Normark, D. S. Penneys, G. F. Schneider, J. S. Strijk, B. B. Tiamiyu, T. L. Trammell, S. R. Weintraub, A. L. Desbiens, and M. Spenko. Extending our scientific reach in arboreal ecosystems for research and management. *Frontiers in Forest and Global Change—Forest Growth*, 2021
- J-41 M. A. Karimi, V. Alizadehyazdi, H. M. Jaeger, and M. Spenko. A self-reconfigurable variable-stiffness soft robot based on boundary-constrained modular units. *IEEE Transactions on Robotics*, pages 1–12, 2021
- J-40 M. Spenko. Making contact: A review of robotic attachment mechanisms for extraterrestrial applications. *Advanced Intelligent Systems*, page 2100063, 2021
- J-39 V. Alizadehyazdi, M. Bonthron, and M. Spenko. Optimizing electrostatic cleaning for dust removal on gecko-inspired adhesives. *Journal of Electrostatics*, 108:103499, nov 2020
- J-38 G. D. Arana, O. A. Hafez, M. Joerger, and M. Spenko. Integrity monitoring for kalman filter-based localization. *The International Journal of Robotics Research*, oct 2020
- J-37 V. Alizadehyazdi, M. Bonthron, and M. Spenko. An electrostatic/gecko-inspired adhesives soft robotic gripper. *IEEE Robotics and Automation Letters*, pages 4679–4686, 2020

- J-36 O. A. Hafez, G. D. Arana, M. Joerger, and M. Spenko. Quantifying robot localization safety: A new integrity monitoring method for fixed-lag smoothing. *IEEE Robotics and Automation Letters*, 5(2):3182–3189, 2020
- J-35 V. Alizadehyazdi and M. Spenko. A microstructured adhesive gripper with piezo-electric controlled adhesion, cleaning, and sensing. *Smart Materials and Structures*, 28(11):115037, oct 2019
- J-34 P. Rivero, A. Simaite, and M. Spenko. Statistical characterization of biomimetic gecko adhesives. *Aerotecnica Missili & Spazio*, jul 2019
- J-33 M. Modabberifar and M. Spenko. Development of a gecko-like robotic gripper using scott-russell mechanisms. *Robotica*, pages 1–9, jun 2019
- J-32 A. Simaite and M. Spenko. Evaluation of silicone elastomers as structural materials for microstructured adhesives. *Bioinspiration & Biomimetics*, may 2019
- J-31 A. Simaite, M. A. Karimi, and M. Spenko. Crosslinker and catalyst as silicone elastomer bonding enhancers: applications to fabrication of hybrid electrostatic/gecko-like adhesives. *Journal of Micromechanics and Microengineering*, 2019
- J-30 V. Alizadehyazdi, A. Simaite, and M. Spenko. Evaluation of material properties for practical microstructured adhesives: Low dust adhesion and high shear strength. *ACS Applied Materials and Interfaces*, 11(8):8654–8666, 2019
- J-29 S. M. J. M. Akherat, M. A. Karimi, V. Alizadehyazdi, S. Asalzadeh, and M. Spenko. A tunable dielectric to improve electrostatic adhesino in electrostatic/gecko-like adhesives. *Journal of Electrostatics*, 97:58–70, 2019
- J-28 A. Simaite, B. Temple, M. A. Karimi, V. Alizadehyazdi, and M. Spenko. Understanding the influence of silicone elastomerproperties on the performance of dry adhesives—wedge-shaped microstructures loaded in shear. *Royal Society Interface*, 2018. 10.1098/rsif.2018.0551
- J-27 M. Joerger, G. D. Arana, M. Spenko, and B. Pervan. A new approach to unwanted-object detection in “gnss/lidar-based” navigation. *Sensors*, 18(2740), 2018. 10.3390/s18082740
- J-26 M. Modabberifar and M. Spenko. A shape memory alloy-actuated gecko-inspired robotic gripper. *Sensors and Actuators A: Physical*, 276(15):76–82, 2018
- J-25 V. Alizadehyazdi, M. Modabberifar, S. M. J. Mahmoudzadeh Akherat, and M. Spenko. Electrostatic self-cleaning gecko-like adhesives. *Journal of The Royal Society Interface*, 15(141), 2018
- J-24 M. Dadkhah-Tehrani, D. Ruffatto, Z. Zhao, and M. Spenko. Increasing adhesion via a new electrode design and improved manufacturing in electrostatic/microstructured adhesives. *Journal of Electrostatics*, 91:48–55, 2018
- J-23 M. Joerger and M. Spenko. Towards navigation safety for autonomous cars: emerging technologies bring cars closer to the ultimate goal of fully autonomous operation. *Inside GNSS*, 12(6), 2017—Invited
- J-22 M. Spenko, S. Buerger, and K. Iagnemma. Editorial for Journal of Field Robotics special issue on the DARPA Grand Challenge Finals. *Journal of Field Robotics*, 34(2):227–228, 2017. 10.1002/rob.21711—Editor

- J-21 M. Graule, P. Chirarattananon, S. Fuller, N. Jafferis, K. Ma, M. Spenko, R. Kornbluh, and R. Wood. Perching and takeoff of a robotic insect on overhangs using switchable electrostatic adhesion. *Science*, 352(6288):978–982, 2016. 10.1126/science.aaf1092
- J-20 C. Nie and M. Spenko. Design and experimental characterization of a rough-terrain omnidirectional unmanned ground vehicle. *Robotica*, 33(9):1984–2000, 2015
- J-19 A. Kalantari and M. Spenko. Modeling and performance assessment of the HyTAQ, a hybrid terrestrial/aerial quadrotor. *IEEE Transactions on Robotics*, 30(5):1278–1285, Oct. 2014
- J-18 Y.-C. Pei, T.-C. Lee, M. Harvey, M. Spenko, D. Ruffatto, and S. Bensmaia. Multi-digit tactile motion stimulator. *Journal of Neuroscience Methods*, 226:80–87, 2014
- J-17 D. Ruffatto, A. Parness, and M. Spenko. Improving controllable adhesion on both rough and smooth surfaces with a hybrid electrostatic/gecko-like adhesive. *Journal of The Royal Society Interface*, 11(93), 2014. 10.1098/rsif.2013.1089
- J-16 D. Ruffatto, J. Shah, and M. Spenko. Increasing the adhesion force of electrostatic adhesives using optimized electrode geometry and a novel manufacturing process. *Journal of Electrostatics*, 72(2):147–155, 2014. 10.1016/j.elstat.2014.01.001
- J-15 G. Meirion-Griffith, C. Nie, and M. Spenko. Development and experimental validation of an improved pressure-sinkage model for small-wheeled vehicles on dilative, deformable terrain. *Journal of Terramechanics*, 51:19–29, 2014. 10.1016/j.jterra.2013.11.003
- J-14 D. Ruffatto, C. Nie, and M. Spenko. The VIV: a mobile ground robot with variable inertial properties. *Journal of the Robotics Society of Japan*, 32(4):329–332, 2014—Invited
- J-13 G. Meirion-Griffith and M. Spenko. A pressure-sinkage model for small-diameter wheels on compactive, deformable terrain. *Journal of Terramechanics*, 50(1):37–44, 2013. 10.1016/j.jterra.2012.05.003
- J-12 G. Meirion-Griffith and M. Spenko. Simulation and experimental validation of a modified terramechanics model for small-wheeled vehicles. *International Journal of Vehicle Design*, 64(2–4):153–169, 2013
- J-11 C. Nie, X. Pacheco-Corcho, and M. Spenko. Versatility and complexity in mobile robot locomotion. *IEEE Robotics & Automation Magazine*, 20(4):72–82, 2013. 10.1109/MRA.2013.2248310
- J-10 G. Meirion-Griffith and M. Spenko. A modified pressure-sinkage model for small, rigid wheels on deformable terrains. *Journal of Terramechanics*, 48(2):149–155, 2011. doi.org/10.1016/j.jterra.2011.01.001
- J-9 M. Spenko, G. C. Haynes, A. Saunders, M. Cutkosky, A. Rizzi, R. Full, and D. Koditschek. Biologically inspired climbing with a hexapedal robot. *Journal of Field Robotics*, 25(4-5):223–242, April 2008
- J-8 S. Kim, M. Spenko, S. Trujillo, B. Heyneman, D. Santos, and M. Cutkosky. Smooth vertical surface climbing with directional adhesion. *IEEE Transactions on Robotics*, 24(1):65–74, Feb 2008 **Winner—IEEE Transactions on Robotics Paper of the Year**

- J-7 D. Santos, M. Spenko, A. Parness, S. Kim, and M. Cutkosky. Directional adhesion for climbing: theoretical and practical considerations. *Journal of Adhesion Science and Technology*, 21(12-13):1317–1341, 2007
- J-6 M. Spenko, H. Yu, and S. Dubowsky. Robotic personal aids for mobility and health monitoring for the elderly. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, 14(3):344–351, September 2006
- J-5 K. Autumn, A. Dittmore, D. Santos, M. Spenko, and M. Cutkosky. Frictional adhesion: a new angle on gecko attachment. *Journal of Experimental Biology*, 209(18):3569–3579, 2006
- J-4 M. Spenko, K. Iagnemma, Y. Kuroda, and S. Dubowsky. Hazard avoidance for high speed mobile robots in rough terrain. *Journal of Field Robotics*, 23(5):311–331, April 2006. 10.1002/rob.20118
- J-3 C. Forest, M. Spenko, Y. Sun, A. Slocum, R. Heilmann, and M. Schattenburg. Repeatable and accurate assembly of x-ray foil optics. *Precision Engineering*, 30(1):63 – 70, 2006
- J-2 H. Yu, M. Spenko, and S. Dubowsky. Omni-directional mobility using active split offset castors. *ASME Journal of Mechanical Design*, 126(5):822–829, 2004
- J-1 H. Yu, M. Spenko, and S. Dubowsky. An adaptive shared control system for an intelligent mobility aid for the elderly. *Journal of Autonomous Robots*, 15(1):53–66, 2003

3.2 Books and Book Chapters

- B-2 M. Spenko, S. Buerger, and K. Iagnemma, editors. *The DARPA robotics challenge finals: humanoid robots to the rescue*. Springer, 2018
- B-1 K. Iagnemma, D. Golda, M. Spenko, and S. Dubowsky. Experimental study of high-speed rough-terrain mobile robot models for reactive behaviors. In B. Siciliano and P. Dario, editors, *Experimental Robotics VIII*, volume 5 of *Springer Tracts in Advanced Robotics*, pages 654–663. Springer Berlin Heidelberg, 2003

3.3 Conference Publications

- C-55 M. Joerger, A. Hassani, M. Spenko, and J. Becker. ”wrong association risk bounding using innovation projections for landmark-based lidar/inertial localization,”. In *Proceedings of the 37th International Technical Meeting of the Satellite Division of The Institute of Navigation (ION GNSS+ 2024)*, Baltimore, Maryland, 2024
- C-54 M. A. Karimi, D. F. C. Bonham, E. Lopez, A. Srivastava, and M. Spenko. Slam and shape estimation for soft robots. In *IEEE International Conference on Intelligent Robots and Systems, IROS*, 2023
- C-53 K. Tanaka, Q. Zhou, A. Srivastava, and M. Spenko. A localization framework for boundary constrained soft robots. In *IEEE International Conference on Intelligent Robots and Systems, IROS*, 2023

- C-52 K. Nagai, Y. Chen, M. Spenko, R. Henderson, and B. Pervan. Integrity with extraction faults in lidar-based urban navigation for driverless vehicles. In *IEEE/ION Position, Location and Navigation Symposium (PLANS)*, 2023
- C-51 B. Saintyves, M. Spenko, and H. Jaeger. Granulobots: Leveraging mechanical properties of a decentralized, multi-unit, dense robotic aggregate for sensorless tasks. *Bulletin of the American Physical Society*, mar 2023
- C-50 K. Nagai, M. Spenko, R. Henderson, and B. Pervan. Fault-free integrity and continuity for driverless urban vehicle navigation with multi-sensor integration: A case study in downtown chicago. In *ION GNSS+, The International Technical Meeting of the Satellite Division of The Institute of Navigation*. Institute of Navigation, oct 2022
- C-49 B. Saintyves, M. Spenko, and H. Jaeger. Granulobot: From granular matter to self-assembling and reconfigurable robotics. *Bulletin of the American Physical Society*, mar 2022
- C-48 K. Nagai, M. Spenko, R. Henderson, and B. Pervan. Evaluating INS/GNSS/LiDAR availability for self-driving cars in urban environments. pages 2121–2132. *Proceedings of the 34th International Technical Meeting of the Satellite Division of The Institute of Navigation (ION GNSS+ 2021)*, sep 2021
- C-47 K. Nagai, M. Spenko, R. Henderson, and B. Pervan. Evaluating INS/GNSS availability for self-driving cars in urban environments. In *Proceedings of the 2021 International Technical Meeting of The Institute of Navigation*. Institute of Navigation, feb 2021
- C-46 K. Tanaka and M. Spenko. A gecko-like/electrostatic gripper for free-flying perching robots. In *2020 IEEE Aerospace Conference*. IEEE, mar 2020
- C-45 M. A. Karimi, V. Alizadehyazdi, B. Busque, H. M. Jaeger, and M. Spenko. A boundary-constrained swarm robot with granular jamming. In *2020 3rd IEEE International Conference on Soft Robotics (RoboSoft)*, pages 291–296, 2020 **Best Paper Finalist**
- C-44 K. Tanaka, M. A. Karimi, B. Busque, D. Mulroy, Q. Zhou, R. Batra, A. Srivastava, H. M. Jaeger, and M. Spenko. Cable-driven jamming of a boundary constrained soft robot. In *2020 3rd IEEE International Conference on Soft Robotics (RoboSoft)*, pages 852–857, 2020
- C-43 O. A. Hafez, G. D. Arana, Y. Chen, M. Joerger, and M. Spenko. On robot localization safety for fixed-lag smoothing: Quantifying the risk of misassociation. In *2020 IEEE/ION Position, Location and Navigation Symposium (PLANS)*, pages 306–317, 2020
- C-42 K. Nagai, T. Fasoro, M. Spenko, R. Henderson, and B. Pervan. Evaluating gnss navigation availability in 3-d mapped urban environments. In *2020 IEEE/ION Position, Location and Navigation Symposium (PLANS)*, pages 639–646, 2020
- C-41 A. Hassani, N. Morris, M. Spenko, and M. Joerger. Experimental integrity evaluation of tightly-integrated IMU/LiDAR including return-light intensity data. In *Proceedings of the 32nd International Technical Meeting of the Satellite Division of The Institute of Navigation (ION GNSS+ 2019)*. Institute of Navigation, oct 2019
- C-40 O. A. Hafez, G. D. Arana, and M. Spenko. Integrity risk-based model predictive control for mobile robots. In *IEEE International Conference on Robotics and Automation*, 2019

- C-39 G. D. Arana, O. A. Hafez, and M. Spenko. Efficient integrity monitoring for kf-based localization. In *IEEE International Conference on Robotics and Automation*, 2019
- C-38 G. D. Arana, O. A. Hafez, and M. Spenko. Recursive integrity monitoring for mobile robot localization safety. In *IEEE International Conference on Robotics and Automation*, 2019
- C-37 A. Hassani, M. Joerge, G. D. Arana, and M. Spenko. Lidar data association risk reduction using tight integration with ins. In *Proceedings of ION GNSS+*, 2018
- C-36 V. Alizadehyazdi, E. McQueney, K. Tanaka, and M. Spenko. Ultrasonic and electrostatic self-cleaning microstructured adhesives for robotic grippers. In *Proceedings of the IEEE International Conference on Intelligent Robotics and Systems*, 2018
- C-35 G. D. Arana, M. Joerger, and M. Spenko. Local nearest neighbor integrity risk evaluation for robot navigation. In *IEEE International Conference On Robotics and Automation*, pages 2328–2333, 2018
- C-34 B. Temple, A. Simaite, and M. Spenko. The effect of bending compliance on adhesion pressure of hybrid electrostatic/gecko-like adhesives. In *IEEE International Conference on Robotics and Automation*, 2018
- C-33 M. Joerger, G. D. Arana, M. Spenko, and B. Pervan. Landmark selection and unmapped obstacle detection in lidar-based navigation. In *Proceedings of the 30th International Technical Meeting of The Satellite Division of the Institute of Navigation (ION GNSS+ 2017)*, 2017
- C-32 M. Dadkhah-Tehrani, Z. Zhao, N. Wettels, and M. Spenko. A self-aligning gripper using an electrostatic/gecko-like adhesive. In *2016 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 1006–1011, Oct 2016
- C-31 M. Joerger, M. Jamoom, M. Spenko, and B. Pervan. Integrity of laser-based feature extraction and data association. In *2016 IEEE/ION Position, Location and Navigation Symposium (PLANS)*, pages 557–571, April 2016
- C-30 A. Kalantari, K. Mahajan, D. Ruffatto, and M. Spenko. Autonomous perching and take-off on vertical walls for a quadrotor micro air vehicle. In *2015 IEEE International Conference on Robotics and Automation (ICRA)*, pages 4669–4674, May 2015
- C-29 M. Snyder and M. Spenko. Assessment of students’ changed spatial ability using two different curriculum approaches; technical drawing compared to innovative product design. In *American Society of Engineering Education*, pages 24.215.1–24.215.9, 2014
- C-28 D. Ruffatto, D. Beganovic, A. Parness, and M. Spenko. Experimental evaluation of adhesive technologies for robotic grippers on micro-rough surfaces. In *Proceedings of the IEEE International Conference on Robotics and Automation*, pages 6150–6155, May 2014
- C-27 D. Ruffatto, D. Beganovic, A. Parness, and M. Spenko. Experimental results of a controllable electrostatic/gecko-like adhesive on space materials. In *IEEE Aerospace Conference*, pages 1–7, March 2014
- C-26 A. Kalantari and M. Spenko. Design and experimental validation of HyTAQ, a hybrid aerial and terrestrial robot. In *Proceedings of the IEEE International Conference on Robotics and Automation*, pages 4445–4450, May 2013

- C-25 D. Ruffatto, J. Shah, and M. Spenko. Optimization and experimental validation of electrostatic adhesive geometry. In *Proceedings of the IEEE Aerospace Conference*, pages 1–8, March 2013
- C-24 D. Ruffatto, J. Shah, and M. Spenko. Optimization of electrostatic adhesives for robotic climbing and manipulation. In *Proceedings of the ASME 36th Mechanisms and Robotics Conference, Parts A and B*, volume 4, pages 1143–1152, 2012
- C-23 A. Kalantari and M. Spenko. Design and prototyping of a walking quadrotor. In *Proceedings of the ASME 36th Mechanisms and Robotics Conference, Parts A and B*, volume 4, pages 1067–1072, 2012
- C-22 D. Ruffatto and M. Spenko. Parameter optimization of directional dry adhesives for robotic climbing and gripping applications. In *Proceedings of the IEEE International Conference on Robotics and Automation*, pages 1187–1192, May 2012
- C-21 C. Nie, G. Hauschka, and M. Spenko. Design and experimental characterization of an omnidirectional unmanned ground vehicle for outdoor terrain. In *Proceedings of the IEEE International Conference on Robotics and Automation*, pages 4016–4021, May 2012
- C-20 G. Meirion-Griffith and M. Spenko. A comprehensive pressure-sinkage model for small-wheeled unmanned ground vehicles on dilative, deformable terrain. In *Proceedings of the IEEE International Conference on Robotics and Automation*, pages 4052–4057, May 2012
- C-19 G. Meirion-Griffith and M. Spenko. Application of a diameter dependent terramechanics model to small-wheeled unmanned ground vehicles operating on deformable terrain. In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems*, pages 305–310, September 2011
- C-18 G. Meirion-Griffith and M. Spenko. Toward establishing a comprehensive pressure-sinkage model for small diameter wheels on deformable terrains. In *Proceedings of the International Society for Terrain-Vehicle Systems Conference, 2011 Winner - Best Paper - Planetary Rovers and Mobile Robotics*
- C-17 M. Spenko and J. Yagoobi. Integrating innovation into engineering education. In *Proceedings of the ASEE Annual Conference*, 2011
- C-16 G. Meirion-Griffith and M. Spenko. An empirical study of the terramechanics of small unmanned ground vehicles. In *Proceedings of the IEEE Aerospace Conference*, pages 1–6, March 2010
- C-15 G. Meirion-Griffith and M. Spenko. A new pressure-sinkage model for small, rigid wheels on deformable terrains. In *Proceedings of the International Society for Terrain-Vehicle Systems Conference*, 2010
- C-13 I. Khan and M. Spenko. Dynamics and control of an omnidirectional unmanned ground vehicle. In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems*, pages 4110–4115, October 2009
- C-14 C. Nie, S. C. van Dooren, J. Shah, and M. Spenko. Execution of dynamic maneuvers for unmanned ground vehicles using variable internal inertial properties. In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems*, pages 4226–4231. IEEE, October 2009

- C-12 C. Nie, S. C. van Dooren, J. Shah, and M. Spenko. Increasing agility in unmanned ground vehicles using variable internal mass and inertial properties. In *Proceedings of the SPIE Conference on Unmanned Ground Vehicle Technology IX*, volume 7332, 2009
- C-11 K. Iagnemma, M. Udengaard, G. Ishigami, M. Spenko, S. Oncu, I. Khan, J. Overholt, and G. Hudas. Design and development of an agile, man portable unmanned ground vehicle. In *Proceedings of the 26th Annual Army Science Conference*, 2008
- C-10 D. Santos, S. Kim, M. Spenko, A. Parness, and M. Cutkosky. Directional adhesive structures for controlled climbing on smooth vertical surfaces. In *Proceedings of the IEEE International Conference on Robotics and Automation*, pages 1262–1267, April 2007
- C-9 S. Kim, M. Spenko, S. Trujillo, B. Heyneman, V. Matolli, and M. Cutkosky. Whole body adhesion: hierarchical, directional and distributed control of adhesive forces for a climbing robot. In *Proceedings of the IEEE International Conference on Robotics and Automation*, pages 1268–1273, April 2007 **Finalist - Best Conference Paper, Winner - Best Student Paper**
- C-8 K. Autumn, N. Gravish, M. Wilkinson, D. Santos, M. Spenko, and M. Cutkosky. Frictional adhesion of natural and synthetic gecko setal arrays. In *Proceedings of the 30th Annual Meeting of the Adhesion Society*, volume 46, pages 58–60, 2006
- C-7 M. Spenko, M. Cutkosky, C. Majidi, R. Fearing, R. Groff, and K. Autumn. Foot design and integration for bioinspired climbing robots. In *Proceedings of the SPIE Conference on Unmanned Systems Technology VIII*, volume 6230, pages 6230 – 6230 – 12, 2006
- C-6 M. Spenko, S. Dubowsky, and K. Iagnemma. Experimental validation of high speed hazard avoidance control for unmanned ground vehicles. In *Proceedings of the 8th International Federation of Automatic Control Symposium on Robot Control*, volume 8, 2006
- C-5 M. Spenko, J. Overholt, and K. Iagnemma. High speed hazard avoidance for unmanned ground vehicles in emergency situations. In *Proceedings of the 25th Annual Army Science Conference*, 2006 **Best Paper—Unmanned Vehicles Session, Runner-Up—Best Conference Paper**
- C-4 M. Spenko, K. Iagnemma, and S. Dubowsky. High speed hazard avoidance for mobile robots in rough terrain. In *Proceedings of the SPIE Conference on Unmanned Systems Technology VI*, volume 5422, pages 439–450, 2004
- C-3 C. Forest, M. Spenko, Y. Sun, M. McGuirk, A. Slocum, and M. Schattenburg. Precision assembly and metrology of x-ray foil optics. In *Proceedings of the 17th Annual Meeting of the American Society of Precision Engineering*, pages 244–249, October 2002
- C-2 Y. Sun, C. Chen, R. Heilmann, C. Forest, M. Spenko, P. Konkola, M. McGuirk, C. Joo, and M. Schattenburg. Precision microcomb design and fabrication for Constellation-X spectroscopy x-ray telescope segmented optic assembly. In *Proceedings of the 17th Annual Meeting of the American Society of Precision Engineering*, pages 261–266, October 2002
- C-1 M. Spenko, H. Yu, and S. Dubowsky. Analysis and design of an omnidirectional platform for operation on non-ideal floors. In *Proceedings of the IEEE International Conference on Robotics and Automation*, volume 1, pages 726–731, 2002

3.4 Theses

- T-2 M. Spenko. *Hazard avoidance for high-speed rough-terrain unmanned ground vehicles*. PhD thesis, MIT, 2005
- T-1 M. Spenko. Design and analysis of the SmartWalker, a mobility aid for the elderly. Master's thesis, MIT, 2001

3.5 Patents

- P-9 Vahid Alizadehyazdi and Matthew Spenko, "Soft, Adaptive, Self-Cleaning Electrostatic Gecko-Like Adhesive and Gripper," US 2020/0338750 Jan 16, 2024.
- P-8 Baudouin Saintyves, Heinrich Jaeger, and Matthew Spenko "Self-Assembling Shape-Morphing Robotic Platform", U.S. Provisional Patent Application No. 63/434,167
- P-7 Ryan Kole, Matthew Spenko, and Vince Bowman, "Razor with intermittent encapsulation of embedded blades" US Patent App. US20220227014A1 Jan 21, 2022
- P-6 Ryan Kole, Matthew Spenko, and Vince Bowman, "Razor Assembly," US 11,104,019, Aug 31, 2021
- P-5 Ryan Kole, Matthew Spenko, and Vince Bowman, "Razor Assembly," US 10,828,793, Nov 10, 2020
- P-4 Ryan Kole, Matthew Spenko, and Naftali Garber, "Razor Assembly." US 2017/0266826, Sep 21 2017.
- P-3 Yu-Cheng Pei, Sliman Bensmaia, Matthew Spenko, and Donald Ruffatto III: "Tactile Motion Stimulator Device." TW1469774B Jan 21, 2015
- P-2 Arash Kalantari and Matthew Spenko, "Hybrid Aerial and Terrestrial Vehicle." US 9,150,069 Oct 6, 2015.
- P-1 Matthew Spenko and Donald Ruffatto, III, "Electrostatic Dry Adhesives." US 2014/0272272 A1 Sep 18, 2014

3.6 Educational Outreach and Community Service

- Technical advisor for Neuqua Valley High School Engineering Design and Development Course, 2024.
- Speaker for Bell Elementary Scientific Olympiad Team, 2024.
- Judge for Bell Elementary FIRST Lego League competition, 2024.
- I have participated in several outreach programs associated with the Museum of Science and Industry, Chicago. I have consulted on the museum's Robot Revolution exhibit, given talks to the general public during National Robotics Week in 2012, '13, '15, and demonstrated our lab's experimental hardware systems for general museum attendees from 2012 through the present. Two of the robots I have worked on, RiSE and HyTAQ, were featured in the traveling Robot Revolution exhibit. Two of my robots, the VIV and the omnidirectional vehicle, are on permanent display in the museum.
- Speaker for Bridge Teen Center, 2015.

- Speaker for the High Jump Program, 2015. High Jump “equalizes access to education for middle school students who have exhibited academic ambition and potential and who are of limited economic means.”
- FIRST Robotics Competition, Judge, 2009, 2011, 2013–2020. FIRST is a nationwide program whose goal is to “inspire young people to be science and technology leaders by engaging them in exciting mentor-based programs that build science, engineering, and technology skills” (www.usfirst.org). The FIRST Robotics Challenge is held in the Chicago area once a year and serves students in grades 9-12.
- FIRST Tech Challenge Robotics Competition, Judge Adviser, 2007–2013. The judge adviser leads the judging sessions and organizes all aspects of judging.
- Illinois Math and Science Academy “Student Inquiry and Research” Mentor, 2008-11. I hosted a high school student once a week in my laboratory. The student learned computer programming, circuit design, and the mechanical design process. Informally, I have also hosted high-school students in the lab in the summers of 2017 and 2018.
- Organizer of the Robotic Challenge for Queen of Peace day at IIT, 2008. IIT hosted over 170 students from Queen of Peace High School to introduce them to engineering and robotics as well as generate excitement for Queen of Peace’s inaugural FIRST robotics team.

4 *Invited Talks*

- “Panel Discussion—XPRIZE Rainforest Finalists” The Explorer’s Club, New York, NY (September, 2024)
- “Boundary Constrained Swarms, a New Concept in Soft Robotics” Michigan State University, Lansing, MI (October, 2022)
- “The RoboticsLab@IIT: From Geckos to Amoebas and Everything In Between” Illinois Robotics Seminar University of Illinois, Champaign-Urbana, IL (February, 2022)
- “Experimental Robotics” Narrative Science, Chicago, IL (February, 2020)
- “Transitioning Gecko-like Adhesives for Robotic Applications from the Laboratory to Real-World Environments” Sherbrooke University, Sherbrooke, Quebec (May, 2019)
- “NU Live! First person stories that shaped their lives” Hosted by the Northwestern Alumni Association, Northwestern University, Evanston, IL (October, 2018)
- “Panel Discussion—TWIN Global 2018 on Autonomous and Electric Vehicles” Northwestern University, Chicago, IL (September, 2018)
- “Integrating Self-driving Car Localization Safety and Urban Design” HERE Technologies, Chicago, IL (July, 2018)
- “Localization Safety for Mobile Robots” Inside GNSS webinar (July, 2018)
- “Navigation Safety for Mobile Robots” Midwest Robotics Workshop, Chicago, IL (June, 2018)
- “Robots—What’s current, what’s coming, and what’s crazy” Chicago Science Fest, Chicago, IL (May, 2018)
- “Panel Discussion—The Robotics Revolution: Augmentation or Automation?” Chicago Industry 4.0 Tech Series, Chicago, IL (May, 2018)
- “Panel Discussion” Adler Planetarium After Dark, Geek Chic IV, Chicago, IL (April, 2018)

- “Electrostatic/Gecko-like Adhesives for Robotic Applications” IIT Physics Colloquium, Chicago, IL (October, 2017)
- “Challenges in Navigation Safety for Self-Driving Cars,” Chicago Connected Car series, Chicago, IL (April, 2017)
- “How to Emerge from the Robot Uprising Unscathed,” Northern Trust, Chicago, IL (July, 2016)
- “Robots: Separating Fact from Fiction & Potential Business Uses,” CoreNet Global Chicago Corporate Real Estate Forum, Chicago, IL (September, 2015)
- “Bioinspired Adhesives for Perching and Climbing Robots,” Chicago Council and Science and Technology Speakeasy, Chicago, IL (July 2015)
- “Controllable Electrostatic/Gecko-like Adhesives for Climbing and Perching Robots,” Naval Surface Warfare Center Crane Division. Crane, IN (July 2015)
- “Integrating Robots into Everyday Life,” Museum of Science and Industry. Chicago, IL (April, 2015)
- “Hybrid Electrostatic/Gecko-Like Adhesives,” NASA In-Space Inspection Workshop. Johnson Space Center, TX (July 2014)
- “Bioinspired Robots for Perching and Climbing,” IIT Trustees Partner Program. Chicago, IL (February 2014)
- “Designing Multimodal Mobile Robots: Translating Complex Biology into Simple Mechanical Structures,” Workshop on Biologically Inspired Based Strategies for Hybrid and Multimodal Locomotion. IEEE IROS. Tokyo, Japan (November 2013)
- “Biologically Inspired Robotics,” Museum of Science and Industry. Chicago, IL (April 2013)
- “Mobile Robots in Challenging Terrains,” IDEO. Chicago, IL (February 2013)
- “Mobile Robots in Challenging Terrains: A Focus on Wheel/Soil Interaction Models,” Jet Propulsion Laboratory. Pasadena, CA (July 2012)
- “Mobile Robots in Challenging Terrains: A Focus on Wheel/Soil Interaction Models,” Northwestern University. Evanston, IL (June 2012)
- “How to Rebel Against Your Future Robot Overlords,” Museum of Science and Industry. Chicago, IL (April 2012)
- “Mobile Robotics in Challenging Terrains: Wheel/Soil Interaction Models,” University of Colorado, Boulder. Boulder, CO (February 2012)
- “Design, Planning, and Control of Dynamic Robots in Challenging Environments,” Air Force Research Lab. Eglin Air Force Base, FL (November 2008)
- “Design, Planning, and Control of Dynamic Robots in Challenging Environments,” General Motors Corporation. Warren, MI (December 2007)
- “Design, Planning, and Control of Dynamic Robots in Challenging Environments,” Massachusetts Institute of Technology. Cambridge, MA (April 2007)
- “Design, Planning, and Control of Dynamic Robots in Challenging Environments,” George Washington University. Washington, DC (March 2007)
- “Design, Planning, and Control of Dynamic Robots in Challenging Environments,” Drexel University. Philadelphia, PA (March 2007)
- “Development of a Controls and Mechatronics Laboratory with Applications in Biomimet-

- ics,” Cooper Union. New York, NY (January 2007)
- “Challenges in Robot Mobility Prediction,” Workshop on the Future of Modeling and Simulation for Robotics. Southwest Research Institute. San Antonio, TX (December 2006)
 - “Hazard Avoidance for High-Speed Unmanned Ground Vehicles in Rough Terrain,” Army Research Office Workshop on Mobility and Control in Challenging Environments. Olin College, Needham, MA (October 2006)
 - “Hazard Avoidance for High-Speed Rough-Terrain Unmanned Ground Vehicles,” NASA Ames Research Center. Moffett Field, CA (June 2005)
 - “Hazard Avoidance for High-Speed Rough-Terrain Unmanned Ground Vehicles,” Cornell University. Ithaca, NY (March 2005)

5 *Professional Honors*

- Xprize Rainforest Finalist—Welcome to the Jungle, 2023
- Xprize Rainforest Semifinalist—Welcome to the Jungle, 2022
- 2022 Dean’s Award for Excellence in Research
- Senior Member, IEEE
- Best Paper Finalist, Robosoft 2020
- One of 21 Researchers to Know, Illinois Science and Technology Coalition, 2019
- MMAE Department Excellence in Research Award, 2018
- MMAE Department Excellence in Teaching Award, 2014 & 2017
- Named a Top Researcher of 2015, ChicagoInno
- IIT/Bauer Family Excellence in Undergraduate Teaching Award, 2014
- Best Paper Award, Planetary Rovers Session—Int. Society of Terrain-Vehicle Systems, 2011
- Air Force Summer Faculty Fellowship, May 2009–July 2009
- Best Paper Award—IEEE Transactions on Robotics, 2008
- Intelligence Community Postdoctoral Research Fellowship, August 2005–July 2007
- Best Student Paper—IEEE Int. Conf. on Robotics and Automation (ICRA), 2007
- Best Paper Finalist—IEEE Int. Conf. on Robotics and Automation (ICRA), 2007
- Best Paper, Unmanned Vehicles Session—Army Science Conference, 2006
- Best Conference Paper Runner up—Army Science Conference, 2006

6 *External Research Support*

Date	Agency and Title	Role	Total (\$)	Portion (\$)
‘22–’24	Xprize —Xprize Rainforest quarterfinalist and semifinalist winnings	PI	350 000	270 000
‘23–’24	Space Force / Starfish Space —Orbital Prime Phase II	PI	450 000	450 000
‘23–’28	DOT —University Transportation Center—Center for Assured and Resilient Navigation in Advanced TransporatION Systems: CARNATIONS	Co-I	10 000 000	480 000

'22-'26	DOE/General Motors/Mathworks—EcoCar EV Challenge	Co-PI	420 002	140 000
'22-'23	NSF—FW-HTF-P: LEAP: Learning, accelerating, and empowering embodied robot technology use within the construction industry	Co-I	149 543	49 847
'22	Space Force/ Starfish Space—On-Orbit Object Capture using a Hybrid Electrostatic/Gecko-Like Adhesive Effector	PI	75 000	75 000
'22-'24	Argonne National Laboratory—Testing and Evaluation of Cooperative Driving Automation Vehicle Systems	PI	178 466	178 466
'21-'24	NSF—IIBR Multidisciplinary: RUI: Cross Departmental Development of an Automated Species Identification System for the Phylum Tardigrada found on Birds	Co-I	273 565	19 548
'21-'24	Argonne National Laboratory—Self Driving Car Instrumentation	PI	263 343	263 343
'18-'22	NSF—EFRI C3 SoRo: Design Principles for Soft Robots Based on Boundary Constrained Granular Swarms	PI	2 000 000	525 000
'18-'21	NSF—NRI: FND: The Urban Design and Policy Implications of Ubiquitous Robots and Navigation Safety	PI	750 000	250 000
'18-'19	NASA & OnRobots—SBIR Phase IIe: Industrial Electrostatic-Gecko Grippers	PI	57 600	57 600
'18-'20	National Geographic Society—Development of an Autonomous Drone for Exploration and Visualization in GNSS-Denied Areas	PI	169 627	169 627
'17	Jet Propulsion Laboratory—Climbing Robots IV	PI	46 175	46 175
'16-'17	Jet Propulsion Laboratory—Climbing Robots III	PI	42 458	42 458
'16-'18	NSF—NRI: Receding Horizon Integrity—A New Navigation Safety Methodology for Co-Robotic Passenger Vehicles	PI	899 926	462 463
'16-'18	NASA & Perception Robotics—SBIR Phase II: Industrial Electrostatic-Gecko Grippers	PI	329 040	329 040
'16-'19	NASA—Early Stage Innovations: A Novel Electrostatic/Microstructured Adhesive with Dust Mitigation Capabilities	PI	414 649	414 649
'15-'16	Commonwealth Edison—A Hybrid Terrestrial/Aerial Drone for Increased Energy Efficiency	PI	98 471	98 471
'15	Jet Propulsion Laboratory—Climbing Robots II	PI	42 037	42 037
'15	NASA & Perception Robotics—SBIR Phase I: Industrial Electrostatic-Gecko Grippers	PI	41 273	41 273

‘14	NSF —Grant for Doctoral Consortium of the 2014 IE/RSJ International Conference on Intelligent Robots and Systems (IROS 2014)	PI	25 000	25 000
‘14–‘15	Jet Propulsion Laboratory —Climbing Robots I	PI	84 074	84 074
‘11–‘15	NASA —TRAINING GRANT: Design of Electrostatic Directional Dry Adhesives for Robotic Attachment Mechanisms	PI	263 300	263 300
‘10–‘13	Office of Naval Research —Multi-Functional Locomotion and Attachment Mechanisms for Hybrid Micro-Air Vehicles (Single PI)	PI	398 780	398 780
‘09–‘10	University of Illinois/ NASA —NASA Space Grant College Fellowship and Scholarship Program: Investigation of Omnidirectional Unmanned Ground Vehicles for Cooperative Tasks	Co-I		10 000
‘09–‘10	Army Research Office —Design and Control of Omnidirectional Unmanned Ground Vehicles for Rough Terrain	Co-I		133 000

7 Professional Activities

7.1 Consulting—Expert Witness and Other Legal Cases

- Alston and Bird. Exotec v. Opex. Providing expert witness consultation for plaintiff, 2024–Present.
- Law Office of Edward Rice. Dongguan Ingleby Mechanical Equipment Company (Plaintiff) vs. Aaron Chien, Te-Ju Chien, Hsin-Yi Wang, and Jasco Products Company, LLC (Defendants). Provided technical advice for the defendant for an indoor sky projection device. 2024.
- Law Office of Edward Rice. Providing technical advice in a case involving an eye massage device. 2024–Present.
- Law Office of Edward Rice. Hyper Ice Inc. and Hyper IP SubCo, LLC (Plaintiff) vs. Bob and Brad, LLC (Defendant). Providing technical advice on claim construction and other matters for the defendant regarding IP involving a percussive massage device. 2024–Present.
- Law Office of Edward Rice. Socket Solutions LLC vs. Import Global LLC (Defendant). Provided claim construction advice for plaintiff. Gave deposition. 2024–Present.
- Automated Pet Care Products, LLC d/b/a Whisker v. PurLife Brands, Inc. d/b/a Smarty Pear and Madeiras. Provided claim construction advice for plaintiff. 2023.
- Kirkland & Ellis LLP—Ocada v. AutoStore, Provided claim construction declaration in patent infringement for robotic and automated warehouse operations. Gave deposition for defendant. 2022.
- Karayannis Law Offices, Personal injury case involving a faulty safety harness, ongoing. Plaintiff.
- Law Office of Edward H. Rice, Patent infringement regarding battery charging devices,

2022. Defendant.

- Kupets & DeCaro, Provided expert witness consulting on a personal injury case involving a traffic accident. Plaintiff.
- Troutman Pepper, Redzone Robotics v. Cues and SewerVue—Reviewed file history, prior literature, and draft complaints for potential patent infringement case. Discussed findings with lawyers. Plaintiff.
- Schain Banks Kenny and Schwartz, Honigsblum v. Next Door & Window Company, Inc., KG Doors, Inc. & Klimek. No. 2014 L 9844—Reviewed documents and provided opinions on the mechanical and mechatronic aspects of garage door operation for a personal injury case. Provided written documentation to lawyers. Defendant.
- Miller Canfield (originally Freeborn & Peters), Fogg Filler Company v. Closure Systems International Inc. (Case No. 1:15-cv-00724)—Worked with lawyers to develop strategies. Gave deposition. Performed prior art review. Analyzed and helped create claims construction brief. Designed and developed 3D models to illustrate how prior art operates. Developed invalidity, expert witness, and rebuttal reports. Defendant.
- Nelson Bumgardner (originally InnovaLaw, P.C.)—Rehco LLC v. Spinmaster, LTD. (Case No. 13-CV-02245). Worked with lawyers to develop strategies for the case. Gave two depositions and testimony at a jury trial. Reviewed prior art. Wrote invalidity, expert witness, and rebuttal reports. Reviewed source code. Plaintiff.
- Northern District of Illinois before Magistrate Judge Cox: Mi-Jack v. Babco—Evaluated mechanical engineering drawings.
- Cavanagh Law Group, Sanders v. Washington—Worked with lawyers to develop theories on how a garage door opener might have failed in a personal injury case. Plaintiff.

7.2 *Editorial and Chair*

- Session Co-Chair, SLAM I, 2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
- Soft Robotics Section Editor of Current Robotics Reports 2021-2023
- Session Co-Chair, Robot Safety, 2020 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
- Session Co-Chair, Soft Grippers, 2020 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
- Executive Program Committee of the 2020 IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob 2020).
- Session Co-chair, Mechanisms: Manipulators 2014 IEEE International Conference on Robotics and Automation (ICRA)
- Travel Grants Chair 2014 IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)
- Local Planning Committee Co-chair 2014 IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)
- Associate Editor Journal of Field Robotics, June 2008–Present
- Associate Editor 2013 IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)
- Session Chair, Navigation, Mapping, and Coverage 2012 ASME IDETC/CIE Conference
- Session Co-chair, Climbing Robots 2012 IEEE International Conference on Robotics and

Automation (ICRA)

- Session Co-chair, Wheeled Robots 2011 IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)
- Session Chair, Dynamic Modeling and Control 2009 IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)

8 *Popular Media*

- Mongabay: “Meet the tech projects competing for a \$10m prize to save rainforests” June 15, 2023
- CBS Evening News: “Striking GM workers to vote on new labor deal” October 20, 2019 <https://www.cbsnews.com/video/gm-workers-on-strike-set-to-vote-on-new-labor-deal/>
- WTTW Chicago Tonight “Despite Judge’s Ban, 3D Gun Blueprints Already Available”
- ABC Newsviews: “Robots in the workplace” 4/8/2018
- Fox News Good Day Chicago, “IIT professor evaluates Elon Musk’s prediction that WWII will happen due to AI” 9/6/2017
- NBC Channel 5, CBS Channel 2, WGN 720 radio, and WTTW Chicago Tonight, Promotion for the opening of the Museum of Science and Industry’s Robot Revolution 5/12/2017
- Profile in Chicago Tribune “Self-driving cars and space robots: This professor draws national eyes to Illinois Tech” 4/26/2017
- Featured segment in Xploration Nature Knows Best - Syndicated Fox TV Show 11/26/2016
- New York Times 5/23/2016 “A Tiny Robot That Can Fly and, Amazingly, Rest”
- ChicagoInno 1/5/2016
- National Public Radio’s Afternoon Shift 4/1/2015
- Chicago Tribune 5/17/2015
- WGN news 3/9/2015
- Chicago Sun Times 2/26/2015
- ASME magazine 1/2014
- EnergyWire 4/14/2015
- Voice of America 1/27/2015
- Columbia Chronicle 3/3/2013
- Chicago Tribune 3/3/2013
- Chicago CBS news affiliate 5/15/2013

HyTAQ Robot

- Discovery News : Crash-proof Quadrotor Roves on Land and Air
- NBCNews : Flying, rolling robot goes just about anywhere
- Engadget : HyTAQ hybrid quadrotor robot travels by air and land, leaves us no place to hide
- Cnet : This quadrotor flies – and rolls – over just about anything
- DF Robot : HyTAQ-a Hybrid Terrestrial and Aerial Quadrotor
- Gizmodo : Uncrashable Rolling Robot Takes To the Skies To Avoid Obstacles
- Gizmag : Rolling HyTAQ robot avoids obstacles by taking to the air
- Feeddoo

- Ubergizmo : HyTAQ Flying Robot
- Gadget Fullest
- Robots.net : HyTAQ, a Hybrid Terrestrial and Aerial Quadrotor
- Geek.com : Hybrid quadrotor seamlessly travels by land or sea
- Phys.org : Illinois robotics lab's HyTAQ moves in air, rolls on land (w/ video)
- Bloomberg : Indestructible Robot Could Be Next Big-Money Drone
- crazyengineers : HyTAQ Robot Walks The Earth, Swims The Sea & Flies The Sky
- Slashgear : HyTAQ robot rolls on the ground and flies through the air

9 *Contributions to Administration and University Service*

University-Wide

- CAMCOPT Member, 2022 and Chair, 2023
- EcoCar Challenge Co-advisor, 2022–present
- Armour College Strategic Planning Committee Head, 2021
- University Faculty Council Financial Committee, 2018–present
- Judicial Board Member, 2015–2020
- University Faculty Council Representative, 2014–2017.
- Inter-professional Project (IPRO) NxtGen Faculty Associate, spring 2012.
- IPRO Review Committee, 2011–2013.
- IIT Pumpkin Launch Committee Member, 2008–2016.

Departmental

- SEDS Rocketry Advisor, 2022–present
- Student Success Committee, 2019
- Strategic Planning Committee, 2018–20
- Academic Unit Committee on Tenure and Promotion Chair, 2017, 2022–present
- Search Committee, 2015–Present, chair, 2022–23
- Modified Committee Chair, 2015
- Parker Chainless Challenge Adviser, 2012–15
- Laboratory & Safety Committee member & chair, 2012–2018
- Academic Honesty Committee, 2010–Present
- Undergraduate Curriculum Committee, 2007–Present
- Mechanical Engineering Curriculum Review Committee, 2008–2009, 2022–present