

# MIT MECH E

[News + Events](#) [People](#) [Academic Programs](#) [Research](#) [Prospective Students](#) [MechE Life](#)

[Home](#) > [People](#)

## Steven Dubowsky

*Professor of Mechanical Engineering*

Room 3-469A  
Massachusetts Institute of Technology  
77 Massachusetts Avenue  
Cambridge MA 02139-4307  
Phone: 617-253-2144  
Fax: 617-258-7881  
Email: [dubowsky@mit.edu](mailto:dubowsky@mit.edu)  
Web: <http://robots.mit.edu/>



### People

FACULTY  
EMERITUS FACULTY  
ADMIN STAFF  
TEACHING STAFF  
LECTURERS  
RESEARCH STAFF  
TECHNICAL STAFF  
SUPPORT STAFF  
POSTDOCS  
VISITORS  
FACULTY CLOUD

### Administrative Contact:

Irina Gaziyeva  
Room 3-469  
Phone: 617-253-5592  
Email: [igaziyev@mit.edu](mailto:igaziyev@mit.edu)

### Education:

BME, Rensselaer Polytechnic Institute, 1963  
MS, Columbia School of Engineering and Applied Science, 1964  
ScD, Columbia School of Engineering and Applied Science, 1971

### MIT Service:

Professor of Mechanical Engineering, 7/82 - Present  
Associate Head, ME Systems and Design Division, 7/82 - 7/83  
Associate Director, Laboratory for Man and And Productivity 11/82 - 7/88  
Head, ME Systems and Design Division, 7/83 -7/88

### Other Related Experience

Perkin-Elmer Corp, Senior Engineer, 6/64-6.71  
University of California, Los Angeles, Professor, 7/71-6/82  
Laboratoire de Robotique de Paris, Professor Invite, 9/95-12/95  
Universite Paris, VI, Distinguished Fellow, 9/95-12/95  
Stanford University, Visiting Professor, 8/02-7/04

### Consulting (In the Past 2 Years) and Patents

Foster-Miller, Waltham, MA, 6/02-present  
Texas Instruments, Dallas, TX, 1/02-6/04  
Siemens, Munich, Germany, 6/04-present  
NASA, Langley, VA, 2/05-2/06  
FSRobotics, Boston, MA, 11/05-present

### Patents

- H. Yu and S. Dubowsky, "Omni-directional Vehicle with Offset Wheel Pairs," Patent No. 6,540,039, April 1, 2003.
- Dubowsky, Steven, Jolesz, Ferenc A, Hafez, Moustafa, Wingert, Andreas, Kacher, Daniel F., "Electrostrictive Polymer Artificial Muscle (EPAM) devices for Magnetic Resonance Imaging," (MRI). Application date:

- November, 2002.
- Dubowsky, Steven, Hafez, Moustapha, Weiss, Peter, Wingert, Andreas "Dielectric Elastomer Actuated Systems and Methods, "Application date: November, 2002.
- G.Morel and S.Dubowsky, "High Performance Control of Manipulators Using A Base Force/ Torque Sensor," Patent Number 5,767,648, May, 1998.

### **Professional Registration**

Registered Professional Engineer, State of California #Csl208 (Control Systems)

### **Principal Publications (Past Two Years):**

1. Wingert, A., Lichter, M.D., and Dubowsky, S., "On the Design of Large-Degree of Freedom Digital Mechatronic Devices based on Bi-stable Dielectric Elastomer Actuators," IEEE/ASME Journal of Mechatronics (In Press).
2. Spenko, M., Yu, H-Y, Dubowsky, S. "A Robotic Personal Aid for the Mobility and Health Monitoring for the Elderly," IEEE Trans on Neural Systems and Rehabilitation Engr (In Press).
3. Hiroshi Ueno (NASDA), Steven Dubowsky, Chris Lee, Chi Zhu(MIT), Yoshiaki Ohkami, Shuichi Matsumoto, Mitsushige Oda(NASDA) "Space Robotic Mission Concepts For Capturing Stray Objects," The Journal of Space Technology, Trans of the JSASS, (In Press).
4. Brooks, C.A., Iagnemma, K.D. and Dubowsky, S., "Dubowsky, Visual Wheel Sinkage Measurement for Planetary Rover Mobility Characterization, Autonomous Robots," Vol. 21:1 1, 2006, pp. 55-64.
5. Dubowsky S., Plante JS., and Boston P., "Low Cost Micro Exploration Robots for Search and Rescue in Rough Terrain," Proceedings of the IEEE International Workshop on Safety, Security and Rescue Robotics, Gaithersburg, MD, USA, August 22-24, 2006
6. Boning, P., and Dubowsky, S., "A Study of Minimal Sensor Topologies for Space Robots," Proc. of the 10th Int. Symp. on Advances in Robot Kinematics June, 2006, Ljubljana, Slovenia.
7. Garretson, J., R., Becker, W., T., and Dubowsky, S., "The Design of a Friction Compensation Control Architecture for a Heavy Lift Precision Manipulator in Contact with the Environment," Proceedings of the IEEE Int. Conference on Robotics and Automation, Orlando, May 15-19, 2006.
8. Plante, JS., Dubowsky, S., "On the Nature of Dielectric Elastomer Actuators and Its Implications for Their Design," Proceedings of the SPIE Smart Structures and Materials 2006: Electroactive Polymer Actuators and Devices, Proceedings of SPIE, San Diego, CA, March 2006.
9. Boston, P.J. and Dubowsky, S., "Hopping Microbot Access to Subsurface (Cave) and Rugged Terrain on Mars and Hazardous Extreme Earth Astrobiology Sites, Proceedings of the American Geophysics Union Congress, San Francisco, CA, 5– 9 December 2005
10. Plante, J. S, Santer, M., Pellegrino, S., And Dubowsky, S. "Compliant Bistable Dielectric Elastomer Actuators For Binary Mechatronic Systems, Proc of the ASME Design Tech. Conf., CA Sept., 2005.
11. Ishijima, Y., Tzeranis, D., and Dubowsky, S., "On-Orbit Maneuvering of Large Space Flexible Structures by Free-Flying Robots," Proceedings of the 8th Int. Symp. on Artificial Intelligence, Robotics and Automation in Space, I-SAIRAS, Munich, Germany, September, 2005.
12. Lichter, M.D., Dubowsky,S., Ueno, H., and Mitani, S., "Shape, Motion, and Parameter Estimation of Flexible Space Structures using Laser Rangefinders," Robotics: Science and Systems, Cambridge, MA, June 8-11, 2005.

13. Shibly, H., Iagnemma, K, and Dubowsky, S., "An Equivalent Soil Mechanics Formulation for Rigid Wheels in Deformable Terrain, with Application to Planetary Exploration Rovers," The Journal of Terramechanics, Volume 42, pp 1-13, 2005.
14. Marco A. Meggiolaro, Steven Dubowsky and Constantinos Mavroidis, "Geometric and Elastic Error Calibration of a High Accuracy Patient Positioning System," Mechanism and Machine Theory, Vol 40, Issue 4, pp.415-427, 2005.
15. Sujan, V. A., and Dubowsky, S., "An Efficient Information-Based Visual Robotic Mapping in Unstructured Environment," The International Journal of Robotics Research. Vol. 24, No. 4, 2005.
16. Matthew D. Lichter, M.D., and Dubowsky, S., "Shape, Motion, and Parameter Estimation of Large Flexible Space Structures using Multiple Range Images," Proc. of the IEEE Int. Conf. on Robotics and Automation, Barcelona, Spain, April 2005.
17. Iagnemma, K and Dubowsky, S., "Traction Control of Wheeled Robotic Vehicles in Rough Terrain," The Intern Journal of Robotics Research, Volume 23, No. 10-11, 2004, pp 1029-1040.
18. Yu, H., Spenko, H. and Dubowsky, S., "Omni-directional Mobility Using Active Split Offset Castors," ASME Journal of Mechanical Design, Volume 126, No.5, pp 822-829, September 2004.
19. Sujan, V.A. and Dubowsky, S. "Visually Guided Cooperative Robot Actions Based on Information Quality," Journal of Autonomous Robots, Vol 17, August 2004, pp. 1-22.
20. Sujan, V.A., Dubowsky, S, Huntsberger, H., Aghazarian, H., Cheng, Y. and Schenker, P., "An Architecture for Distributed Environment Sensing with Application to Robotic Cliff Exploration," The Journal of Autonomous Robots, Volume 16, No. 3, May 2004, pp 287-311.
21. DF Kacher, J Vogan, A Wingert, M Hafez, J-S Plante, S Dubowsky, FA Jolesz. "Development of a Reconfigurable MRI Coil using Electrostrictive Polymer Artificial Muscle Actuators," Proceedings of the International Society of Magnetic Resonance in Medicine p3394, (May, 2004) Kyoto, Japan.
22. Iagnemma, K. and Dubowsky, S. "Estimation, Planning, and Control of Mobile Robots in Rough Terrain with application to Planetary Rovers." Heidelberg, 2004.

### **Scientific & Professional Societies**

Fellow of the American Society of Mechanical Engineers

Fellow of the Institute of Electrical and Electronic Engineers

Honors & Awards – Major Awards in the Past 5 Years

ASME Machine Design Award, 2001

Best Paper Award, ASME 27th Biennial Mechanisms and Robotics Conference, 9/2002

Selected as a Fellow of the NASA Institute of Advances Concepts, 9/2005

### **Department and Institute Committees (Past 2 Years:)**

9/04-7/05 Control Faculty Search Committee

[\*back to top\*](#)

[About MechE](#) | [Contact Info](#) | [Site Map](#)



Massachusetts Institute of Technology | Department of Mechanical Engineering  
77 Massachusetts Avenue, Room 3-173 | Cambridge, Massachusetts 02139