

MARCIA K. O'MALLEY

Mechanical Engineering and Materials Science
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RESEARCH INTERESTS

Robotics and mechatronics. Design, modeling, and control of electromechanical devices and systems. Design and control of haptic interfaces. Scaled bilateral telemanipulation systems. Human-machine interfaces for human-assisted movement and rehabilitation. Modeling human-robot interactions.

EMPLOYMENT

Assistant Professor, Mechanical Engineering and Materials Science, Rice University
Date of appointment: July 1, 2001 Contract renewal: July 1, 2004

Assistant Professor, Computer Science, Rice University (Complementary appointment, 3 years)
Date of appointment: July 1, 2005 Renewed: July 1, 2008

Adjunct Assistant Professor of Physical Medicine and Rehabilitation, Baylor College of Medicine
Date of appointment: October 2, 2005

EDUCATION

Purdue University	Mechanical Engineering	B.S.M.E.	1996
Vanderbilt University	Mechanical Engineering	M.S.	1999
Vanderbilt University	Mechanical Engineering	Ph.D.	2001

HONORS AND AWARDS

George R. Brown Award for Superior Teaching, Rice University, 2008
National Science Foundation CAREER Award, 2005
Office of Naval Research (ONR) Young Investigator, 2004
NASA/ASEE Summer Faculty Fellowship, 2002 and 2003
Vanderbilt University Graduate Fellowship, 1996-2001
NASA Graduate Student Researchers Program Fellowship, 1998-2001

REFEREED JOURNAL PUBLICATIONS

Publications with students designate the students with an asterisk ().*

1. O. Celik*, M.K. O'Malley, C. Boake, H. Levin, N. Yozbatiran, and T. Reistetter. (2010) Normalized Movement Quality Measures for Therapeutic Robots Strongly Correlate with Clinical Motor Impairment Measures," *IEEE Transactions on Neural Systems and Rehabilitation Engineering* (to appear April 2010)
2. A. Gupta* and M.K. O'Malley. (2010) Disturbance observer-based force estimation for haptic feedback, *ASME Journal of Dynamic Systems, Measurement and Control* (to appear 2010)
3. J. Huegel*, O. Celik*, A. Israr, and M.K. O'Malley. (2009) Expertise-Based Performance Measures in a Virtual Training Environment. *Presence: Teleoperators and Virtual Environments*, 18(6): 449-467.
4. M.K. O'Malley, K.S. Sevcik*, and E. Kopp*. (2009) Improved Haptic Fidelity via Reduced Sampling Period with an FPGA-Based Real-Time Hardware Platform. *ASME Journal of Computing and Information Science in Engineering*, 9(1): 011002-1 – 011002-7.
5. A. Israr, Y. Li*, V. Patoglu, and M.K. O'Malley (2009). Passive and Active Discrimination of Natural Frequency of Virtual Dynamic Systems. *IEEE Transactions on Haptics*, 2(1): 40-51.
6. Y. Li*, V. Patoglu, and M.K. O'Malley (2009). Negative efficacy of fixed gain error reducing shared control for training in virtual environments. *ACM Transactions on Applied Perception*. 6(1): 3-1 – 3-21.
7. A. Gupta*, V. Patoglu, M.K. O'Malley, and C.M. Burgar (2008). Design, Control and Performance of RiceWrist: A Force Feedback Wrist Exoskeleton for Rehabilitation and Training, *International Journal of Robotics Research (IJRR)* 27(2): 233-51.
8. M.K. O'Malley, T. Ro, and H.S. Levin (2006). Assessing and Inducing Neuroplasticity with TMS and Robotics, *Archives of Physical Medicine and Rehabilitation*; Supplement 2 / Neuroplasticity and Brain Imaging Research: Implications for Rehabilitation), Vol. 87(12): 59-66.
9. M.K. O'Malley and G. Upperman* (2006). A Study of Perceptual Performance in Haptic Virtual Environments, *Journal of Robotics and Mechatronics*, 18(4): 467-475.

10. A. Gupta* and M.K. O'Malley (2006) Design of a Haptic Arm Exoskeleton for Training and Rehabilitation, *ASME/IEEE Transactions Mechatronics*, 11(3): 280-289.
11. M.K. O'Malley, A. Gupta*, M. Gen*, and Y. Li* (2006) Shared Control in Haptic Systems for Performance Enhancement and Training, *ASME Journal of Dynamic Systems, Measurement and Control*, 128(1): 75-85.
12. M. O'Malley and M. Goldfarb (2005) On the Ability of Humans to Haptically Identify and Discriminate Real and Simulated Objects. *Presence: Teleoperators and Virtual Environments*, 14(3): 366-376.
13. M. O'Malley and M. Goldfarb (2004) The Effect of Virtual Surface Stiffness on the Haptic Perception of Detail. *IEEE/ASME Transactions on Mechatronics*, 9(2): 448-454.
14. M. O'Malley and R. Ambrose (2003) Haptic Feedback Applications for Robonaut, *Industrial Robot: An International Journal*, 30(6): 531-542.
15. M. O'Malley and M. Goldfarb (2002) The Effect of Force Saturation on the Haptic Perception of Detail. *IEEE/ASME Transactions on Mechatronics*, 7(3): 280-288.

All publications can be found at <http://mahilab.rice.edu>

SYNERGISTIC ACTIVITIES

- Associate Editor for IEEE Transactions on Haptics and ASME/IEEE Transactions on Mechatronics
- Advisor of over ten Brown Undergraduate Research Scholars, Rice University
- Chair, ASME Dynamic Systems and Control Division Robotics Technical Committee (2008-present)
- Co-Chair IEEE Technical Committee on Haptics (2008-present)
- Member, Haptics Symposium Program Committee (2003-2008)
- Member, ASME (Dynamic Systems and Controls Division)
- Member, IEEE (Robotics and Automation Society)
- Reviewer for numerous journals

<ul style="list-style-type: none"> ASME Journal of Dynamic Systems, Measurement, and Control ASME Transactions, Journal of Computing and Information Science in Engineering IEEE/ASME Transactions on Mechatronics IEEE Transactions on Robotics IEEE Transactions on Control Systems Technology IEEE Computer Graphics and Applications IEEE Transactions on Visualization and Computer Graphics 	<ul style="list-style-type: none"> IEEE Transactions on Neural Systems & Rehabilitation Engineering IEEE Transactions on Systems, Man, and Cybernetics IEEE Transactions on Industrial Electronics ACM Transactions on Applied Perception Haptics-e: The Electronic Journal of Haptics Research Presence: Teleoperators and Virtual Environments Visual Computer
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COLLABORATORS AND OTHER AFFILIATIONS

Rice University: Michael Byrne (joint project funded by NSF), Walid Taha (joint project funded by NSF)
 University of Michigan: R. Brent Gillespie
 Drexel University: Patricia Shewokis
 University of Maryland: Jose Luis Contreras Vidal
 University of Houston: Zhigang Deng, Gangbing Song
 NASA: Robert Ambrose, Ph.D.; Bill Bluethmann, Ph.D.; Michael Massimino, Ph.D.
 Baylor College of Medicine: Harvey Levin, Ph.D.; Michael Liebschner, PhD
 The Institute for Rehabilitation Research (TIRR): Gerard Francisco, M.D., Corwin Boake, Ph.D.
 Central Texas Veterans Health Care System: Charles Burgar, M.D., Ph.D., P.E.

Graduate Advisor: Michael Goldfarb, Professor of Mechanical Engineering, Vanderbilt University

Post-Doctoral advisees: Zahra Kadivar, Ph.D.; Volkan Patoglu, Ph.D.; Ali Israr, Ph.D.

Thesis Advisor

PhD students: Ozkan Celik, Vinay Chawda, Abhishek Gupta, Joel Huegel, Yanfang Li, Samuel McJunkin, Joshua Mehling, Dane Powell, Sagar Purkayastha
 MS/MME students: Christopher Bartley, Benjamin Black, Kevin Bowen, Emilie Kopp, Stephanie Kreml, Ali Utku Pehlivan, Brian Stiles, Zachary Thompson, Fernando Zumbado

Total number of graduate students advised – 18