

**Round Table Group  
Consultant Curriculum Vitae**

**William C. Messner, Ph.D.**

---

**Expertise**

- Mechanical Engineering
- Mechanical Design
- Control Systems
- Robotics
- Autonomous vehicles
- Assistive Technologies
- Data Storage Systems
- Microfluidics
- Biological Systems
- Instrumentation for Biological and Biomedical Research

---

**Professional Summary**

Dr. William Messner is an adjunct professor of mechanical engineering at Carnegie Mellon University. He was a member of Carnegie Mellon teams competing in the DARPA Grand Challenge in 2004 and 2005. He is the co-developer of the web-based Control Tutorials for MATLAB® and Simulink®. He was a visiting professor of medicine at Harvard Medical School and a visiting scientist at the Brigham and Women's Hospital in 2005-2006 He is a Fellow of the AAAS and the ASME, a Senior Member of IEEE, and a winner the Education Award from ASME's Dynamic Systems and Controls Division.

**Round Table Group  
Consultant Curriculum Vitae**

---

## Employment History

From: 2019     **Carnegie Mellon University**  
To: Present  
Position: *Adjunct Professor*  
  
Mechanical Engineering

From: 2012     **Tufts University**  
To: 2019  
Position: *John R. Beaver Professor (2012-2017), Chair (2012-2015)*

- Manage department facilitate department operations, advocate for the department at the college and university level, develop consensus for important, generate enthusiasm for the department and its programs, among faculty, students, staff, and alumni, provide vision for department direction and future growth.
- Specialize in automatic controls with emphasis on data storage systems, robotics, and microfluidics for biological experimentation at the cellular and tissue level.
- Teach graduate and undergraduate controls classes.
- Advise graduate students

From: 1993     **Carnegie Mellon University**  
To: 2012  
Position *Assistant Professor, Associate Professor, Full Professor, Adjunct Professor*

- Department of Electrical and Computer Engineering and the Robotics Institute by courtesy. • Leader of controls effort for the Data Storage Systems Center. • Robotics work includes highly distributed control coordination control; flight control for helicopter unmanned aerial vehicles; path planning, shock isolation, and control for the Red Team, the Carnegie Mellon entry in the DARPA Grand Challenge, • Leader, Augmented Harvest for Comprehensive Automation for Specialty Crops project. • Co-developer of Control Tutorials for MATLAB® and other innovative education software

**Round Table Group  
Consultant Curriculum Vitae**

From: 2013     *United States Air Force Scientific Advisory Board*

To: 2016

Position *Special Government Employee*

Review USAF research programs. Advise Secretary of the Air Force on technology issues.

From: 2005     Harvard Medical School (HMS) and Brigham and Women's Hospital (BWH)

To: 2007

Position *Visiting Professor of Medicine (HMS) and Visiting Senior Scientist (BWH)*

Studying the mechanics of actin networks cross-linked by filamins. Investigating the effect of hinge regions on rheological property by producing mutant filamins without hinge regions using recombinant DNA techniques.

From: 1990     Neuro-Muscular Research Center, Boston University

To: 1990

Position *Research Consultant*

Conducted force plate experiments of humans in quiet standing. Analyzed resulting stabilogram data. Modeled human postural control system.

From: 1985     BBN Laboratories

To: 1987

Position *Staff Engineer*

Developed software for automatic evaluation of torpedo test firings using BBN proprietary software. Participated in the development of a torpedo test simulator using BBN Butterfly parallel processor.

Position M.I.T. Biomechanics Laboratory

From: 1984

To: 1985     *Undergraduate Researcher*

Designed and built machine for dynamic calibration of kinematic data acquisition system. Studied the integration of this system with accelerometry. Examined the effect of various digital FIR and IIR filters and numerical differentiators.

**Round Table Group  
Consultant Curriculum Vitae**

**Litigation Support Experience**

(Note: Those entries marked with \* indicate testimony by trial, hearing or deposition in the last 5 years. The retaining party is underlined.)

- Date: 2019      Pillsbury Winthrop Shaw and Pittman  
*Sleep Number Corporation v. American National Manufacturing Corporation*  
Patent Infringement  
Active
- Date: 2017-2018      Goodwin Procter  
*Varidesk v. Joint Respondents*  
Patent Infringement  
Inactive
- Date: 2017-2018      Greenberg Traurig and Pillsbury Winthrop Shaw and Pittman  
*iRobot v. Joint Respondents*  
Patent Infringement  
Inactive
- Date: 2016-2018      Baker Botts  
*Fujifilm Corporation v. Sony Corporation*  
Patent Infringement  
Inactive
- Date: 2016      Fish and Richardson  
*Diebold v. Nautilus*  
Patent Infringement  
Inactive
- Date: 2015-2016      Banie and Ishimoto Name  
*Luxe Link LLC v. Alexx, Inc.*  
Patent Infringement  
Inactive
- Date: 2015      Orrick Herrington and Sutcliffe  
*Research Corporation v. Oracle Corporation*  
Patent Infringement  
Inactive
- Date: 2014-2015      Wilmer Hale  
*Advanced Research Corporation v. Oracle Corporation*  
Patent Infringement  
Inactive
- Date: 2014- 2016      Schnelker, Rassi, and McConnell

**Round Table Group  
Consultant Curriculum Vitae**

*Open Systems Technologies v. TransGuard Insurance Company of America, Champagne Logistics and University Moving and Storage Company*  
Patent Infringement  
Inactive

Date: 2009-2010 Zuber and Taillieu  
*Guzik Technical Enterprises v. Western Digital Corporation*  
Patent Infringement  
Inactive

Date: 2009 WilmerHale  
*Guzik Technical Enterprises v. Western Digital Corporation*  
Personal Injury  
Inactive

Date: 2007 Fennemore Craig  
*Braun Corp. v. Vantage Mobility International*  
Patent Infringement  
Inactive

Date: 2007 WilmerHale  
*Braun Corp. v. Honda Corp*  
Patent Infringement  
Inactive

Date: 2005-2006 Hennigan, Bennett, and Dorman  
*Universal City Development Partners, Ltd. v. Ride and Show Engineering, Inc.*  
Patent Infringement  
Inactive

Date: 2004-2006 Fish and Richardson  
*Seagate Technology LLC v. Cornice, Inc.*  
Patent Infringement  
Inactive

Date: 2002-2012 McDermott, Will, and Emery  
*Convolve, Inc. and the Massachusetts Institute of Technology v. Compaq Computer Corp and Seagate Technology, LLC*  
Patent Infringement

**Round Table Group  
Consultant Curriculum Vitae**

Inactive

Date: 2001-2002 Faegre and Benson  
*Hutchinson Technology, Inc. v. Magnecomp Group et al. and  
Magnecomp Group v. Hutchinson Technology, Inc.*  
Patent Infringement  
Inactive

Date: 2001 Hale and Dorr  
*Iomega Corp. v. Castlewood Systems, Inc.*  
Patent Infringement  
Inactive

Date: 2000-2002 Orrick, Herrington, and Sutcliffe  
*Convolve, Inc. and Massachusetts Institute of Technology v. Compaq  
Computer Corp and Seagate Technology, LLC*  
Patent Infringement and Trade Secret  
Inactive

Date: 2000-2001 Webb, Ziesenheim, Logsdon, Orkin, and Hanson, P.C.  
*Sunrise Medical HHG Inc. v. AirSep Corp.*  
Patent Infringement  
Inactive

Date: 1997 Western Digital Corporation  
*Taught course on multi-input control for disk drives*

Date: 1997 Morgan, Lewis, and Bockius  
*Provided advice on a patent infringement case.*

Date: 1996 Applied Concepts  
*Provided mechanical designs for advanced gripping tool development.*

Date: 1996 Samsung Advanced Institute of Technology  
*Presented research on disk drive servos. Advised engineers on future  
research directions.*

## Round Table Group Consultant Curriculum Vitae

Date: 1992      Chemical Engineering Laboratory, Institute of Physical and Chemical Research (RIKEN)  
*Visiting Researcher. Developed program for determining the turn trajectory of a mobile robot with steering from a reference path of connected straight-line segments.*

### Education

<u>Year</u>	<u>College/University</u>	<u>Degree</u>
1992	University of California, Berkeley	Ph.D., Mechanical Engineering
1989	University of California, Berkeley	M.S., Mechanical Engineering
1985	Massachusetts Institute of Technology Cambridge	B.S., Mathematics

### Additional Professional Experience:

#### Honors

- Tufts Multicultural Service Award, 2019
- Tufts ASME Student Chapter Faculty Appreciation Award, 2016
- Bridge to Engineering Success at Tufts (BEST) Faculty Appreciation Award, 2015 John R. Beaver Professor of Mechanical Engineering, Tufts University, 2012
- CMU Mechanical Engineering Senior Class Professor of the Year 2000, 2003, 2005, 2008, 2011 Benjamin Richard Teare Award Teaching of the Carnegie Mellon College of Engineering, 2009 Ruth L. Kirschstein National Research Service Award Fellowship of National Heart, Lung and Blood Institute, 2006.
- Amesbury High School Hall of Honor, 2004 Senior Member IEEE, 2004
- Fellow of the American Association for the Advancement of Science, 2003 Fellow of the American Society of Mechanical Engineers, 2003
- Education Award of the Dynamic Systems and Controls Division of the American Society of Mechanical Engineers, 2003
- Best Paper Finalist, IEEE International Conference on Robotics and Automation, 2003 Theodore Ahrens Development Chair in Mechanical Engineering, 2000
- National Academy of Engineering, Frontiers of Engineering participant, 1999
- EDUCOM Medal for improving the undergraduate educational experience through the use of information technology, 1997
- Best Paper Finalist, IEEE International Conference on Robotics and Automation, 1997 George Tallman Ladd Award for Excellence in Research, 1996
- National Science Foundation Summer Institute in Japan, 1992 IBM Fellowship, 1991-1992

## **Round Table Group Consultant Curriculum Vitae**

- University of California Regents Fellowship, 1987-1988
- Wunsch Foundation Award for Excellence in Undergraduate Research, 1985 Finalist in MIT 2.70 Introduction to Design Contest, 1983

### **Professional Associations and Offices**

- Tau Beta Pi Sigma Xi
- Phi Beta Kappa
- American Association for the Advancement of Science Institute of Electrical and Electronic Engineers American Society of Mechanical Engineers
- American Society of Engineering Educators
- Founder of Mechanical Engineering Graduate Student Council, U.C. Berkeley Secretary, MIT Class of 1985 (1990-2000)
- Captain, MIT Swim Team 1984-85

### **Invited Seminars**

1. “Elements of Effectiveness: My Experience Teaching Controls,” ASME International Mechanical Engineering Education Leadership Summit, New Orleans, LA 20-23 March 2019.
2. “Mouse Knee Joint-In-Motion Culture System for Osteoarthritis Research--Design, Capabilities, and Experimental Result,” Carnegie Mellon University, Pittsburgh, PA, 27 October 2017.
3. “Bring on the Driverless Car,” Northeastern University, Boston, MA, 18 October 2016, and Osher Lifelong Learning Institute, Medford, MA, 19 September 2016.
4. Rensselaer Polytechnic Institute—Leaders in Engineering, Troy, NY, 4 September 2013.
5. “The Celebrated Developing Frog of Allegheny County,” Tufts University, Medford, MA March 2012, Oregon State University, 24 March 2014, Pennsylvania State University, State College, PA, 22 April 2014,
6. “Loop Shaping in the 21<sup>st</sup> Century,” Advanced Storage Technology Consortium, Santa Clara, CA, 19 Oct 2011.
7. “Survey of Servo Research at DSSC: Actuation, Sensing, and Controller Design,” Advanced Storage Technology Consortium, Santa Clara, CA, 31 Jan 2011.
8. “Loop-shaping Controller Design with the RBode Plot.” Presented at Western Digital Corporation 16 August 2010, at the University of California at Berkeley Department of Mechanical Engineering, 17 August 2010, and UC San Diego 19 November 2010.

## **Round Table Group Consultant Curriculum Vitae**

9. "Microfluidics for Investigation of Spatiotemporal Dynamics in Biological Systems." Presented at the University of Michigan Department of Mechanical Engineering, 22 January 2010 and at Harvard University School of Engineering and Applied Science, 2 April 2010.
10. "CMOS MEMS electrothermal rotary actuator for disk drives: performance and thermal analysis." Presented at the Workshop on Dynamics and Control of Micro and Nano-scale System, IBM Zurich, 10 December 2009.
11. "Simultaneous PES Generation, Timing Recovery, and Multi-track Read on Patterned Media: Concept and Performance." Presented at The Magnetic Recording Conference, Tuscaloosa, AL, 5-7 Oct 2009.
12. "Instrumentation for Biological Research." Presented at the Frontiers Session at the Dynamic Systems and Control Conference, 12 October 2009.
13. "Classical Control Revisited." Presented at the Massachusetts Institute of Technology Department of Mechanical Engineering, 7 November 2008.
14. "Classical Control Revisited." Presented at Western Digital Corporation, San Jose, CA, 25 Jun 2008; Samsung Corporation, Suwon, Korea, 8 Jul 2008; Hitachi Central Research Laboratories, Fujisawa, Japan, 9 Jul 2008; Fujitsu Laboratories, Ltd, Atsugi, Japan, 10 Jul 2008.
15. "Classical Control Revisited: Variations on a Theme," Plenary presentation, Advanced Motion Control Conference, Trento, Italy, 28 March 2008.
16. "A Taste of Controls," Department of Mechanical and Aerospace Engineering, State University of New York at Buffalo, Buffalo, NY, 8 Feb 2008.
17. "CMOS MEMS Electrothermal Actuator for Skew Compensation," *International Storage Technology Symposium*, Kalamata, Greece, 21 June 2007.
18. "Rheology Background for Biologists," Harvard University, Cambridge, MA, 5 June 2007.
19. "Disk Drives: History, Technology, and Trends," Eminent Speaker Series, Charles L. Brown Department of Electrical and Computer Engineering, University of Virginia, Charlottesville, VA 23 March 2007.
20. "PES Driven Equalization," *The Magnetic Recording Conference*, Carnegie Mellon University, Pittsburgh, PA, 7-9 August 2006 with Jian-gang Zhu, Vijayakumar Bhagavatula, Jin Xie, and Mark Lin.
21. "The Advanced Distributed Manipulation System," University of Colorado, Boulder, 27 February 2006.

**Round Table Group  
Consultant Curriculum Vitae**

22. “Robotic Desert Racing with the Red Team,” University of Trento, Italy, 28 June 2005.
23. “How Did We Get Here? A Brief History of Nanotechnology,” *SAE Inner Values Symposium—Nanotechnology for the Automotive Industry*, Carnegie Mellon University, 11-12 May 2004.
24. “PES Driven Equalization and Other Provocative Ideas,” *Lake Arrowhead Interactive Workshop on Data Storage*, UCLA Lake Arrowhead Conference Center, Lake Arrowhead, CA, 7-10 December 2003.
25. “Modeling and Control for Robotic Helicopters,” University of Illinois Urbana Champaign, 4 February 2003.
26. “Servo Patterns and Patterned Media for Servo” and “An Introduction for Tracking Control for Tape Drives,” *2001 Information Storage Technology Symposium*, Kalamata, Greece, 2-7 September 2001.
27. “Patterned Media for Servo,” *Patterned Media Workshop*, University of Alabama, Tuscaloosa, AL, 15 November 2000.”
28. “Robust Controller Design for Tape Transport Servo,” *Information Storage and Processing Systems Conference*, Santa Clara, CA, 21 June 2000.
29. “Disk Drive Technology and Two-Stage Actuator Control,” University of Michigan, Ann Arbor, MI, 11 February 2000; Massachusetts Institute of Technology, Cambridge, MA, 21 April 2000; Cornell University, Ithaca, NY, 4 May 2000.
30. “Control Schemes for Pivot Bearing Nonlinearities and Microactuator Control”, *Information Processing and Storage Symposium*, Santa Clara, CA, 28 June 1999.
31. “Servo: Challenges and Opportunities on the Path to 100 Gbits/in<sup>2</sup>”, *IDEMA High TPI Symposium*, Minneapolis, MN, 2 June 1999.
32. “The Modular Distributed Manipulator System”, Department of Mechanical Engineering, University of Illinois, Urbana-Champaign, 21 April 1999; Ohio State University, 19 November 1999; Clemson University, 3 December 1999.
33. “Piezoelectric Microactuator and Control”, Interactive Workshop on Data Storage, Lake Arrowhead CA, 7 December 1998.
34. “Controller Design for Dual-Input/Single-Output Systems”, Western Digital Corporation, 20 November 1998.
35. “Servo: Progress and Challenges on the Path to 100 Gbits/in<sup>2</sup>”, *Information Storage Technology Symposium*, Kalamata, Greece, 7 September 1998.

**Round Table Group  
Consultant Curriculum Vitae**

36. "Parcel Manipulation and Dynamics: The Virtual Vehicle," Department of Mechanical Engineering, University of California, Berkeley, 23 January 1998.
37. "Controls Tutorials for MATLAB," Department of Mechanical Engineering, University of California, Berkeley, 23 January 1998.
38. "Tape Tracking Research at DSSC," Quantum Corporation, Shrewsbury, MA, 6 November 1997.
39. "Time Optimal Feedforward Algorithms for Disk Drives," Quantum Corporation, Shrewsbury, MA, 6 November 1997.
40. "The Virtual Vehicle," Department of Mechanical Engineering, University of California, San Diego, 14 August 1997.
41. "Controls Research at the Carnegie Mellon Data Storage Systems Center," University of California, San Diego, 20 May 1997.
42. "Bias in Disk Drive Rotary Actuators: Characterization, Prediction, and Compensation," Samsung Advanced Institute of Technology, Suwon, Korea, 17 June 1996.
43. "Control System Challenges to Achieving 10-100 Gbits/in<sup>2</sup>," *Information Storage Technology Symposium*, Kalamata, Greece, September 1995 and University of Pittsburgh, 15 October 1996.
44. "Learning Control Using Integral Transforms," University of Michigan, 24 March 1995.
45. "Recent Research and Open Issues in Control for Disk Drives," Magnetic Technology Center, National University of Singapore, December 1994.
46. "Friction in Disk Drive Rotary Actuator Ball Bearings," Seagate Technologies, Scotts Valley, CA, 6 January 1995; IBM, San Jose, CA, 21 December, 1994; HP-Labs, Palo Alto, CA, 20 December.
47. "Comparison of Repetitive Control Algorithms", Precision Engineering Program, University of North Carolina at Charlotte, March 1993.

## **Round Table Group Consultant Curriculum Vitae**

### **Panels**

1. "Automation and the future of work." Tufts University, 20 April 2017.

### **Media Appearances**

1. "Professor William Messner on electric car technology" CCTV America, interview with Phillip Yin. 1 Dec 2015. <https://www.youtube.com/watch?v=fn2nYDqEt-4>
2. "Professor William Messner on the market for self-driving cars," CCTV America. 20 Oct 2016. [https://www.youtube.com/watch?v=9IhbiaVVH\\_4](https://www.youtube.com/watch?v=9IhbiaVVH_4)
3. "William Messner on self driving car safety," CCTV America, interview with Karina Huber. 27 Sep 2016. <https://www.youtube.com/watch?v=OcS2I9vUE-Q>
4. "William Messner on the future of Tesla cars," CCTV America, interview with Karina Huber. 20 Oct 2016. <https://www.youtube.com/watch?v=03V3UPwzsrU>

### **Patents**

1. "Two Dimensional Electro-optic Beam Scanner" with T. E. Schlesinger and D. Stancil. US Patent 6,480,323 issued on 12 November 2002.
2. "Frequency Modulation Pattern for Position Error Signal Generation for Disk Drives" with Xiangdong Lin and Jian-Gang Zhu. US Patent 6,754,016 issued 22 June 2004.
3. "Simultaneous Bit Pattern Determination and Head Positional Information Detection on Patterned Media" with Vijayakumar Bhagavatula, James Bain, Hiroyuki Suzuki, Sheida Nabavi, U.S. Patent 7,948,708 issued 24 May 2011.
4. "Micromachined Electrothermal Rotary Actuator" with J.A. Bain and G.K. Fedder. US Patent 8,243,397 issued 14 August 2012.
5. "Systems and Methods for Magnetic Head Translation" with J.A. Bain US Patent 8,289,659 issued 16 Oct 2012.
6. "3D chemical pattern control in 2D fluidics devices" with Y.-T. Kim and P.R. LeDuc US Patent 8,695,618 B2 issued 15 April 2014.
7. "Fluid pressure regulator and related methods and systems" with Y.-T. Kim, B. Kuczynski, and P. LeDuc. US Patent 9,170,267 B2 issued 27 Oct 2015.
8. "Fluid pressure regulation systems and software" with Y.-T. Kim, B. Kuczynski, and P. LeDuc. US Patent 9,625,918 issued 18 April 2017.

## Round Table Group Consultant Curriculum Vitae

### EDUCATIONAL CONTRIBUTIONS

- “Control Tutorials for MATLAB™ and Simulink™,” with Professor Dawn Tilbury, University of Michigan, and Rick Hill at University of Detroit, Mercy <http://control.me.cmu.edu/CTMS> These are multi-media, highly interconnected, “learn-by-doing” tutorials for learning to analyze and design control systems using the popular MATLAB™ software package. (This site is the top ranked result of search on “control tutorial” in Google or Bing.)
- “Modeling Tutorials for MATLAB™ and Simulink™” with Ian Tseng and Dawn Tilbury. Web- based tutorials for modeling dynamic systems with MATLAB™ and Simulink™.
- “Loop Shaping in the 21<sup>st</sup> Century” with Takenori Atsumi, a workshop held at the American Controls Conference in San Francisco, CA 29 Jun – 1 Jul 2011.
- “Loop Shaping in the 21<sup>st</sup> Century” with Takenori Atsumi, a workshop held at the American Controls Conference in Boston, MA 6-8 Jul 2016.
- “Motors, Generators, Metal, and Magnets: Hands-on Introduction to Electromagnetism for Ages 9 and Up” Various venues, summer 2019.

### SELECTED GRANTS AND CONTRACTS

#### Principal Investigator

- “Collaborative Research: Long Term Spatiotemporal Control to Investigate Dynamics in *Xenopus Laevis* Embryonic Development,” National Science Foundation, \$505,146, 1 Sep 2011 - 31 Aug 2014.
- “Nonlinear Control and Modeling of Smart Valves,” Office of Naval Research, \$176,000, 1 Jan 2010 – 31 May 2012 (subcontract to Villanova).
- “Nonlinear Control and Modeling of Smart Valves,” Office of Naval Research, \$187,500, 1 Jan 2008-31 Dec 2009 (subcontract to Villanova).
- “Research on Actively Controlled Tape Guides,” Information Storage Industry Consortium,  
• \$65,000, March 2008-February 2009.
- “CMOS MEMS Electrothermal Rotary Actuator for HDD Track Following and Skew Correction,” Seagate Technology Research Center, \$50,000, 18 April 2007-17 April 2008.
- “Position Error Signal Generation for Patterned Media,” Fujitsu Limited, \$50,000,

## **Round Table Group Consultant Curriculum Vitae**

December 2006-30 November 2007.

- “Microfluidic System for Spatiotemporal Investigations of Cellular Mechanics,” National Science Foundation, \$249,877, 1 Sep 2006-31 Aug 2010.
- “Mechanics Actin Networks Cross-Linked by Filamins” National Research Service Award of the National Heart, Lung, and Blood Institute, \$45,277, 1 Mar 2006-28 Feb 2007.
- “Bearing Hysteresis Modeling and Compensation,” Information Storage Industry Consortium,
  - \$30,000, 1 Jan 2004—31 Dec 2005.
- “Hysteresis in Actuator Pivot Bearings,” Information Storage Industry Consortium, \$30,000, 1 Jan 2004—31 Dec 2004.
- “Control for Active Tape Steering” Subcontract to Imation/NIST Advanced Technology Program: Multi-Terabyte Tape Systems, \$400,000, 1 November 2002—31 October 2006.
- “Integrated Modeling, Control, and Guidance for Full Envelope Flight of Robotic Helicopters” National Science Foundation, \$522,000, 1 September 2002—31 August 2006.
- “Human Robot Collaboration at the Miniature Scale”, National Aeronautics and Space Administration, \$214,000, 1 March 2002—30 November 2002.
- “New Servo Patterns for Patterned Media,” Information Storage Industry Consortium, \$45,000, 1 November 2002—31 October 2003.
- “Servo Patterns for Patterned Media,” National Storage Industry Consortium, \$60,000, 1 February 2002—31 August 2002.
- “Servo Patterns for Patterned Media,” National Storage Industry Consortium, \$30,000, 1 February 2001—31 January 2002.
- “Advanced Digital Control for High Capacity Disk Drives,” National Science Foundation, National Science Foundation, \$300,569, 1 August 2000—31 July 2004.
- “Patterned Media for Disk Drives,” National Storage Industry Consortium, \$60,000, 15 January 1999—14 January 2000.
- “Modular Distributed Manipulator System”, National Science Foundation, \$296,000, 1 September 1998 - August 2002

## **Round Table Group Consultant Curriculum Vitae**

- “Web-Assisted Experimentation: Enhancing Controls Education,” National Science Foundation, \$162,217, 1 August 1998 - 31 July 2000.
- “NSIC Head/Media Specification Testing,” Data Storage Systems Center/National Storage Industry Consortium, \$26,500, May - October 1997.
- “Instrumented Suspension and Dual Stage Actuator Development,” Data Storage Systems Center Sponsoring Affiliate: Hutchinson Technology Incorporated, \$275,000, April 1997 - March 2000.
- “Servo Control System Development for a High Speed Variable Data Rate Multimedia Tape Recorder,” 3M/National Institute of Standards Advanced Technology Program Award (subcontract), \$441,501, October 1995-September 2000.
- “Laser Doppler Vibrometer and Dynamic Signal Analyzer for Bearing Dynamics Research,” National Science Foundation Research Engineering Equipment Grant, \$55,073, May 1995- April 1996.
- “Friction Compensation in Disk Drive Rotary Actuator Ball Bearings,” National Science Foundation Research Initiation Award, \$64,997, September 1994-August 1997.
- “Controls for Magnetic Tape, Magnetic Disk, and Optical Disk Drives,” Carnegie Mellon Data Storage Systems Center, an NSF Engineering Research Center
  - \$150,307, October 1999-September 2000.
  - \$144,056, October 1998-September 1999.
  - \$179,478, October 1997-September 1998.
  - \$157,373, October 1996-September 1997.
  - \$141,755, October 1995-September 1996.

### **Co-Principal Investigator**

- “Measuring and Applying Cognitive Load,” United States Army Natick Soldier Research, Development and Engineering Center and Tufts Center for Applied Brain and Cognitive Sciences, \$70,000, September 2015 - September 2016.
- “Comprehensive Automation for Specialty Crops,” US Department of Agriculture, \$5,900,000, 1 Oct 2008-30 Sep 2012 (investigator share \$422,400).
- “Controls Education Using M<sub>ATLAB</sub><sup>TM</sup>: Tutorials Using the World Wide Web,” National Science Foundation, \$88,430, March 1996 - February 1998.

### **Faculty Associate**

- “ITR: Synthetic Reality: Physically Rendering Dynamic 3D Objects from Programmable Matter,” NSF, \$1,405,514, 1 September 2004 – 31 August 2009.

## Round Table Group Consultant Curriculum Vitae

- “Magnetic Tape Ultra-High Density Recording,” DSSC/ARPA/NSIC, \$120,000, April 1993- March 1995.
- “Advanced Tracking for Magnetic Disk Drives,” DSSC/ARPA/NSIC, \$118,000, April 1993- March 1995.

### Publications

#### Books/Chapters in Books

1. W. Messner, editor, *Autonomous Vehicles: Technologies that Matter*, SAE International, 2014.
2. J. Luntz, W. Messner, and H. Choset, “Discreteness Issues in Actuator Arrays”, *Distributed Manipulation*, p. 103-26, K. Böhringer and H. Choset, editors, Kluwer Academic Publishers, 2000.
3. J. Luntz, W. Messner, H. Choset, “Velocity Field Design for the Modular Distributed Manipulator System,” in *Robotics: The Algorithmic Perspective*, p. 35-48, P. Agarwal, L. Kavraki, and M. Mason, eds., A.K Peters, Natick, MA 1998.
4. W. Messner and D. Tilbury, “*Controls Tutorials for MATLAB™ and Simulink™: A Web-based Approach*,” Addison-Wesley-Longman, 1998. Soft cover book with CD-ROM. This is a commercialization of the tutorials available for free on the World Wide Web. See education contributions.

#### Journal Publications

1. S. Rozen-Levy, W. Messner, and B. Trimmer, “The Design and Development of Branch Bot, a Branch-Crawling, Caterpillar-Inspired, Soft Robot” *International Journal of Robotics Research*, Article DOI: 10.1177/0278364919846358, 2 May 2019.
2. W. Crooks, G. Vukasin, M. O’Sullivan, W. Messner, C. Rogers, “Fin ray effect inspired soft robotic gripper: from the RoboSoft Grand Challenge toward optimization,” *Frontiers in Robotics and AI*, 3 (2016): 70.
3. M. Hazar, Y. Kim, J. Song, P. LeDuc, L. Davidson, and W. Messner, “3D bio-etching of a complex composite-like embryonic tissue, *Lab on a Chip*, 2015, 15, 3293 - 3299, DOI: 10.1039/C5LC00530B, 3 Jul 2015.
4. L. González, W. Ruder, A. Mitchell, W. Messner, P. LeDuc, “Sudden motility reversal indicates sensing of magnetic field gradients in *Magnetospirillum magneticum* AMB-1 strain.” *The ISME journal*, (published) 9(6), 1 Jun 2015, 1399-1409.
5. Y. Kim, M. Hazar, D. Vijayraghavan, J. Song, T. Jackson, S. Joshi, W. Messner, L.

## Round Table Group Consultant Curriculum Vitae

Davidson, and P. LeDuc, "Mechanochemical actuators of embryonic epithelial contractility," *Proceedings of the National Academy of Sciences*, published ahead of print doi/10.1073/pnas.1405209111, 22 Sep 2014.

6. W. Messner, J. Paik, R. Shepherd, S. Kim, B. Trimmer, "Energy for Biomimetic Robots: Challenges and Solutions," *Soft Robotics*, 1(2): 106-109. doi:10.1089/soro.2014.1501, June 2014.
7. L. Gonzalez, W. Ruder, P. LeDuc, and W. Messner, "Controlling Magnetotactic Bacteria through an Integrated Nanofabricated Metallic Island and Optical Microscope Approach," *Scientific Reports*, doi:10.1038/srep04104, Feb 2014.
8. J.D. Taylor, and W. Messner, "Controller design for nonlinear systems using the Contoured Robust Controller Bode plot," *Int. J. Robust. Nonlinear Control* (2013). doi: 10.1002/rnc.3049, Aug 2013.
9. M. Bedillion, W. Messner, Trajectory Tracking Control for Actuator Arrays, *IEEE Transactions on Control Systems Technology*, 2015, 21(6): 2341-2349.
10. Y. Kim, P. LeDuc, and W. Messner, "Modeling and control of a nonlinear mechanism for high performance microfluidic systems," *IEEE Transactions on Control Systems Technology*, v. 21, n. 1, p. 203-211, Jan 2013.
11. T. Atsumi, and W. Messner, "Compensating for ZOH Induced Residual Vibration."
12. *IEEE/ASME Transactions on Mechatronics*, v. 99 p. 1-22, 2012. doi: 10.1109/TMECH.2012.2228878
13. T. Atsumi, and W. Messner. "Estimation method for unobservable settling vibration of head- positioning control in hard disk drives." *Mechatronics* (2012).
14. T. Atsumi and W. Messner. "Suppression of Residual Vibration of Mechanical Resonance beyond the Nyquist Frequency." *Transactions of the Japan Society of Mechanical Engineers Series C* 78, no. 789 (2012): 1362-1377.
15. Gentilini, M. Kim, W. Messner, "Lateral Tape Motion Control With Robust Performance Evaluation Based on RBode Plot, *IEEE Transactions on Industrial Electronics*, v. 59, n. 10, p. 3971-3978, Oct 2012. DOI: 10.1109/TIE.2011.2130505
16. T. Atsumi, W. Messner, "Analysis of unobservable oscillations in sampled-data positioning system," *IEEE Transactions on Industrial Electronics*, v. 59, n. 10, p. 3951-3960, DOI : 10.1109/TIE.2011.2159355. 27 Apr 2012.
17. G. Cherubini, C. Chung, W. Messner, and R. Moheimani, "Control Methods in Data Storage Systems," *IEEE Transactions on Control Systems Technology*, v. 20, n. 2, pt. 1, p. 296-322, Mar 2012.

## Round Table Group Consultant Curriculum Vitae

18. T. Atsumi, and W. Messner, "Modified Bode Plots for Robust Performance in SISO Systems with Structured and Unstructured Uncertainties," *IEEE Transactions on Control Systems Technology*, v. 20, n. 2, pt. 1, p. 356-368, Mar 2012.
19. Y. Kim, W. Messner, and P. LeDuc, "Disruptive microfluidics: From life sciences to world health to energy," *Disruptive Science and Technology*, v. 1, n. 1, p. 41-53. Feb. 2012.
20. T. Atsumi, W. Messner, "Optimization of head-positioning control in a hard disk drive using the RBode plot," *IEEE Transactions on Industrial Electronics*, v. 59, n. 1, p. 521-529, Jan 2012. DOI : 10.1109/TIE.2011.2143377.
21. T. Atsumi and W. Messner, "Analysis of residual vibrations beyond the Nyquist frequency in sampled data control system," *Journal of System Dynamics and Design*, v. 5, n. 7, p. 1444- 1459, 2011.
22. T. Atsumi and W. Messner, "Mixed sensitivity problem in sampled-data positioning control system," *Journal of System Dynamics and Design*, v. 5, n. 6, p. 1294-1309, 2011.
23. P.R. LeDuc, W.C. Messner, J.P. Wikswo, "How Do Control-Based Approaches Enter into Biology?" *Annual Review of Biomedical Engineering*, DOI: 10.1146/annurev-bioeng-071910-124651. 17 May 2011.
24. Y. Kim Y, S.D. Joshi, L.A. Davidson, P.R. LeDuc, W.C. Messner, "Dynamic control of 3D chemical profiles with a single 2D microfluidic platform," *Lab on a Chip*, DOI: 10.1039/C1LC20077A. v. 11, p. 2182-2188, 28 Apr 2011.
25. J.A. Bain, V. Bhagavatula, Y. Cai, S. Jeon, K. Mai, W. Messner, H.S. Cheow, Y. Wang, and J.-G. Zhu, "Extendibility of traditional perpendicular magnetic recording for hard disk drives," *Journal of Applied Physics*, v. 109, n. 7, Apr 2011.
26. Y. Kim Y, S.D. Joshi, W.C. Messner, P.R. LeDuc, L.A. Davidson, "Detection of Dynamic Spatiotemporal Response to Periodic Chemical Stimulation in a *Xenopus* Embryonic Tissue." *PLoS ONE* 6(1): e14624. doi:10.1371/journal.pone.0014624. 31 Jan 2011.
27. K. E. Kasza, C. P. Broedersz, G. H. Koenderink, Y. C. Lin, W. Messner, E. A. Millman, F. Nakamura, T. P. Stossel, F. C. MacKintosh, and D. A. Weitz, "Actin Filament Length Tunes Elasticity of Flexibly Cross-Linked Actin Networks," *Biophysical Journal*, v. 99, p. 1091- 1100, Aug 2010.
28. H. Suzuki, W.C. Messner, J.A. Bain, V. Bhagavatula, and S. Nabavi, "Simultaneous PES Generation, Timing Recovery, and Multi-Track Read on Patterned Media: Concept and Performance," *IEEE Transactions on Magnetics*, v. 46, n. 3, p. 825-829, Mar 2010.

**Round Table Group  
Consultant Curriculum Vitae**

29. L. Xia and W. Messner, "Active Tape Steering Control System," *Mechatronics*, v. 20, n 1, p 6-11, Feb. 2010.
30. Y. Kim, K. Pekkan, W. C. Messner, and P. R. LeDuc, "Three-Dimensional Chemical Profile Manipulation using Two-Dimensional Autonomous Microfluidic Control", *Journal of the American Chemical Society (JACS)*, 132(4), 1339-1347, 2010.
31. H. Suzuki, W.C. Messner, J.A. Bain, V. Bhagavatula, and S. Nabavi, "A Method for Simultaneous Position and Timing Error Detection on Patterned Media," *IEEE Transactions on Magnetics*, v. 45, n. 10, p 3749-52, Oct 2009.
32. M. Bedillion and W. Messner, "Control of Actuator Arrays," *International Journal of Robotics Research*, v. 28, n. 7, Jul 2009, p. 868-882.
33. Y. Kim, B. Kuczenski, P. LeDuc, and W. Messner, "Modulation of Fluidic Resistance and Capacitance for Long-Term, High-Speed Feedback Control of a Microfluidic Interface," *Lab on a Chip*, v 9, n. 17, 2603-9, Jun 2009.
34. K.E. Kasza, G.H. Koenderink, Y.C. Lin, C.P. Broedersz, W. Messner, F. Nakamura, T.P. Stossel, F.C. MacKintosh, D.A. Weitz, "Nonlinear elasticity of stiff biopolymers connected by flexible linkers," *Physical Review E (Statistical, Nonlinear, and Soft Matter Physics)*, v 79, n 4, Apr 2009. p 041928 (5 pp.).
35. B. Kuczenski, W. Ruder, W. Messner, and P. LeDuc, "Probing Cellular Dynamics with a Chemical Signal Generator," *PLoS ONE* 4(3): e4847. doi:10.1371/journal.pone.0004847, 16 Mar 2009.
36. B. Kuczenski, P. LeDuc, and W. Messner, "Pressure-Driven Spatiotemporal Control of the Laminar Flow Interface in a Microfluidic Network," *Lab on a Chip*, v. 7, n. 5, May 2007, p. 647-9.
37. D. Helmick, W. Messner, and C. F. Higgs, "Bias in Hard Disk Drive Rotary Actuator Pivot Bearings: Measurements and Lubrication Phenomena," *Microsystem Technologies*, v. 13, n. 8-10, May 2007, p. 1377-82.
38. W. Messner, L. Xia, M. Bedillion, and D. Karns, "Lead and Lag Compensators with Complex Poles and Zeros: Design Formulas for Modeling and Loop Shaping," *IEEE Control Systems Magazine*, v. 27, n. 1, February 2007, p. 44-54.
39. C. Urmson, J. Anhalt, D. Bartz, M. Clark, T. Galatali, A. Gutierrez, S. Harbaugh, J. Johnston,
40. H. Kato, P. Koon, W. Messner, N. Miller, A. Mosher, K. Peterson, C. Ragusa, D. Ray, B. Smith, J. Snider, S. Spiker, J. Struble, J. Ziglar, W. Whittaker, "A Robust Approach to High-Speed Navigation for Unrehearsed Desert Terrain." *Journal of Field Robotics*, v. 23, n. 8, August 2006, p. 467-508.
41. M. La Civita, G. Papageorgiou, W. Messner, and T. Kanade, "Design and Flight Testing

## Round Table Group Consultant Curriculum Vitae

of a  $H_\infty$  Loop Shaping Controller for a Robotic Helicopter." *AIAA Journal of Guidance, Control, and Dynamics*, v. 29, n. 2. March-April 2006, p 485-94. (Also presented at *AIAA Guidance, Navigation, and Control Conference and Exhibit 2002*, AIAA-2002-4836, Monterey, CA, 5- 8 Aug 2002.)

42. P. Herget, T. Ohno, J.A. Bain, K. Takatani, M. Taneya, W. C. Messner, and T. E. Schlesinger, "Laser Diode Active Height Control for Near Field Optical Storage," *Japanese Journal of Applied Physics, Part 1*, v. 45, n. 2B, Feb 2006, p. 1193-6.
43. E. Hughes and W. Messner, "New servo pattern for hard disk storage using pattern media," *Journal of Applied Physics*, v. 93, n. 10, 15 May 2003, p. 7002-4. (Also presented at *2002 Magnetism and Magnetic Materials*, Tampa, FL, 11-15 Nov 2002.)
44. P.D. Mathur and W. Messner, "Evaluation of Test Procedures for Determining Servo Compatibility of Heads and Media Used in Magnetic Disk Drives," *IEEE Transactions on Magnetics*, v. 28, n. 3, May 2002, p. 1575-92.
45. J. Luntz, W. Messner, H. Choset, "Distributed Manipulation Using Discrete Actuator Arrays," *International Journal of Robotics Research*, v. 20, N.7, Jul 2001, p. 553-83.
46. W. Messner, "Some Advances in Loop Shaping with Applications to Disk Drives," *IEEE Transactions on Magnetics*, v. 37, n. 2, Mar 2001, p. 651-6.
47. H. Rapley and W. Messner, "Designing Controllers for Two Stage Disk Drive Actuator Systems Using the PQ Method and the Sode Plot," *IEEE Transactions on Magnetics*, v. 37, n. 2, pt. 1, p. 944-8, Mar 2001.
48. S. Schroeck, W. Messner, and R. McNab, "On Compensator Design for Linear Time-Invariant Dual-Input Single-Output Systems," *IEEE/ASME Transactions on Mechatronics*, v. 6, n. 1, Mar 2001, p. 50-7. doi: 10.1109/3516.914391
49. W. Doggett, W. Messner, and J.-N. Juang, "Global Minimization of the Robot Base Reaction Force during 3D Maneuvers," *IEEE Transactions on Robotics and Automation*, v. 16, n. 6, , p. 700-11, Dec 2000.
50. W. Doggett, W. Messner, and J.-N Juang. "Multiple Center of Mass Space Images of Single Objects and Their Impact on Path Planning," *International Journal of Robotics Research*, v. 19, n. 9, p. 848-56, Sep 2000.
51. J. Zhu, X. Lin, and W. Messner, "Spin Stand Study of Density Dependence of Switching Proprieties in Patterned Media" *IEEE Transactions on Magnetics*, v. 36, n. 5, p. 2999-3001, Sep 2000. (Presented at the *2000 INTERMAG* , 9-13 Apr 2000.)
52. W. Messner, "Simple Formulas for Direct Design of Discrete-Time Lead Compensators," *ASME Transactions on Dynamic Systems, Measurement, and Control*, v. 122, n. 2, p. 358-60, Jun 2000.

**Round Table Group  
Consultant Curriculum Vitae**

53. X. Lin, J. Zhu, and W. Messner, "Investigation of Advanced Error Signal Patterns in Patterned Media," *Japan Journal of Applied Physics*, v. 39 p. 5117-19, Part 1, n. 2B, May 2000.
54. J. Zhai, Y. Huang, S. Schroeck, W. Messner, D. Stancil, and T.E. Schlesinger, "High Bandwidth Electro-optic Scanner for Optical Data Storage," *Japan Journal of Applied Physics*, v. 39, p. 883-7, Part 1, n. 2B, Feb 2000.
55. J. Zhu, X. Lin, L. Guan, and W. Messner, "Recording Noise, and Servo Characteristics of Patterned Thin Film Media," *IEEE Transactions on Magnetics*, v. 36, n. 1, p. 23-9, Jan 2000. (Presented at the 1999 The Magnetic Recording Conference, 9 Aug 1999.)
56. D. Tilbury and W. Messner, "Control Tutorials for Software Instruction over the World- Wide Web," *IEEE Transactions on Education*, v. 42, n. 4, p. 237-246, Nov 1999.
57. Y. Huang, M. Banther, P. Mathur, and W. Messner, "Design and Analysis of a High Bandwidth Disk Drive Servo System Using an Instrumented Suspension," *IEEE/ASME Transactions on Mechatronics*, v. 4, n. 2, p. 196-206, Jun 1999.
58. R. Evans, J. Griesbach, and W. Messner, "Piezoelectric Microactuator for Dual Stage Control," *IEEE Transactions on Magnetics*, v. 35, n. 2, 977-82, Mar 1999. (Presented at the 1998 Asia Pacific Magnetic Recording Conference, Singapore, 29-31 Jul 1998.)
59. J. Bain, W. Messner, J. Steele, T. Schwarz, W. O'Kane, and M. Connolly, "Limitations to track following imposed by position error signal SNR using a multi-tapped magnetoresistive servo head," *IEEE Transactions on Magnetics*, v. 35, n. 2, pp. 440-445, Mar 1999.
60. Y. Huang and W. Messner, "A Disturbance Observer Design for Magnetic Disk Drive Servo Systems," *Journal of Information Processing and Storage Systems*, v. 1, n. 1, p. 75-86, Jan 1999.
61. Y. Huang and W. Messner, "A Novel Disturbance Observer Design for Magnetic Hard Drive with a Rotary Actuator," *IEEE Transactions on Magnetics*, v. 34, N.4, p. 1892-4, Jul 1998.
62. J. Steele, W. Messner, J. Bain, T. Schwarz, W. O'Kane, and M. Connolly, "Multi-Tapped Magnetoresistive Heads for Magnetic Tape Tracking Servo," *IEEE Transactions on Magnetics*, v. 34, n. 4, p. 1904-1906, Jul 1998.
63. P. Mathur and W. Messner, "Frequency Domain Characterization of Take-up Reel Air Entrainment in High Speed Low Tension Tape Transport," *ASME Journal of Tribology*, v. 120, n. 3, p. 554-558, Jul 1998.
64. P. Mathur and W. Messner, "Controller Development for a High-Speed Low-Tension

## Round Table Group Consultant Curriculum Vitae

Tape Transport," *IEEE Transactions on Control Systems Technology*, v. 6, n. 4, p. 534-542, Jul 1998, doi: 10.1109/87.701350

65. Y. Huang and W. Messner, "A Novel Robust Time-Optimal Feedforward Algorithm for Servo Systems with Bias Disturbance," *IEEE Transactions on Magnetics*, v. 34, n. 1, p. 7-12, Jan 1998. (Presented at *The Magnetic Recording Conference*, Minneapolis, MN, 8-10 September 1997.)
66. K. Eddy, J. Steele, and W. Messner, "Bias in Disk Drive Rotary Actuators: Characterization, Prediction, and Compensation," *IEEE Transactions on Magnetics*, v. 33, n. 3, p. 2424-2436, May 1997.
67. J. Luntz and W. Messner, "A Distributed Control System for Flexible Materials Handling," *IEEE Control Systems Magazine*, v. 17, n. 1, p. 22-28, Feb 1997.
68. W. Messner and C. Kempf, "Zero Placement for Designing Discrete-Time Repetitive Controllers," *Control Engineering Practice*, v. 4., n. 4., p. 563-569, Apr 1996. (Presented as "Using Zero Placement and Root Locus Techniques to Design Robust Discrete-Time Repetitive Controllers," *3rd International Workshop on Advanced Motion Control*, p. 761- 770, Berkeley, CA, Mar 1994.)
69. H. Sacks, W. C. Messner, and M. Bodson, "MR Head Effects on PES Generation: Simulation and Experiment," *IEEE Transactions on Magnetics*, v. 32, n. 3, p. 1773-1778, May 1996. (Presented at the *First Asia Pacific Magnetic Recording Conference*, Singapore, 29 November - 1 December 1995.)
70. M. Kryder, W. Messner, and L. Carley, "Approaches to 10 Gbit/in<sup>2</sup> Recording," *Journal of Applied Physics*, v. 79, n. 8, p. 4485-4490, 15 Apr 1996. (Presented at the *1995 Conference on Magnetism and Magnetic Materials*, Philadelphia, PA, 6-11 Nov 1995.)
71. T. Abe, W. Messner, M. Reed, "Effects of Elevated Temperature Treatments in Micro-structure Release Procedures," *IEEE Journal on Micro Electromechanical Systems*, v. 4, n. 2, p. 66-74, Jun 1995. (Presented at the *1995 IEEE Micro-electro Mechanical System Workshop*, Amsterdam, 29 January - 2 February 1995.)
72. W. Messner and M. Bodson, "Design of Adaptive Feedforward Algorithms Using Internal Model Equivalence," *International Journal of Adaptive Control and Signal Processing*, v. 9, 4, p. 199-212, March - April 1995. (Also in the *Proceedings of the 1994 American Controls Conference* Baltimore, MD, v. 3 p. 1619-1623, Jun 1994.)
73. Sacks, M. Bodson, and W. Messner, "Advanced Methods for Repeatable Runout Compensation," *IEEE Transactions on Magnetics*, v. 31, No 2, p. 1031-1036, Mar

## Round Table Group Consultant Curriculum Vitae

1995. (Presented at *The Magnetic Recording Conference*, La Jolla, CA, Aug 1994.)

76. E. Gross, M. Tomizuka, and W. Messner, "Cancellation of Discrete-time Non-minimum Phase Zeros by Feedforward Control," *ASME J. Dynamic Systems, Measurement and Control*, v. 116, n. 1, p. 33-36, Mar 1994. (Presented at *ASME Winter Annual Meeting*, Paper 92-WA/DSC-8, Anaheim, CA, Nov 1992.)
77. C. Kempf, W. Messner, M. Tomizuka, and R. Horowitz, "A Comparison of Four Discrete-Time Repetitive Control Algorithms," *IEEE Control Systems Magazine*, v. 13, n. 6, p. 48-54, December 1993. (Presented at the *American Controls Conference*, Chicago, IL, June 1992.)
78. W. Messner and R. Horowitz, "Identification of a Nonlinear Function in a Dynamical System," *ASME J. Dynamic Systems, Measurement and Control*, v. 115, n. 4, p. 587-591, Dec 1993. (Presented at *ASME Winter Annual Meeting*, Paper n. 90-WA/DSC-20, Dallas, TX, Nov 1990.)
79. J. Moore, R. Horowitz, and W. Messner, "Functional Persistence of Excitation and Observability for Learning Control Systems," *ASME J. Dynamic Systems, Measurement, and Control*, v. 114, n. 3, p. 500-507, Sep 1992.
80. R. Horowitz, W. Messner, and J. Moore, "Exponential Convergence of a Learning Controller for Robot Manipulators," *IEEE Trans. Auto. Control*, v. 36, n. 7, 890-894, Jul 1991.
81. W. Messner, R. Horowitz, W.-W. Kao, and M. Boals, "A New Adaptive Learning Rule," *IEEE Trans. Auto. Control*, v. 36, n. 2, p. 188-197, Feb 1991. (An earlier version was presented at the *1991 American Controls Conference*.)
82. Z. Ladin, W. Flowers, and W. Messner, "A Quantitative Comparison of a Position Measurement System and Accelerometry," *J. Biomechanics*, v. 22, n. 4, p. 295-208, Jun 1989.

### Conference Publications

(See above for papers presented in refereed conferences before publication in journals.)

1. P. Echols-Jones, M. Dokukin, I. Sokolov, and W. Messner, "Switched dual-actuator control for AFM subresonant tapping modes." To be presented at the *2017 American Controls Conference*, Seattle, WA, 24-26 May 2017.
2. P. Echols-Jones, M. Dokukin, I. Sokolov, and W. Messner, "Advanced manual system identification using lead and lag compensators with complex poles and zeros." To be presented at the *2016 Dynamics Systems and Control Conference*, Minneapolis, MN 12-14 Oct 2016.
3. JD Taylor and W. Messner, "Robust Bode controller design methods for unstable and

## Round Table Group Consultant Curriculum Vitae

- non- minimum phase systems,” *2015 American Controls Conference*, Chicago, IL 1-3 Jul 2015.
4. M. Hazar, Y. Kim, J. Song J, W. Messner, L. Davidson, and P. LeDuc, “Probing dynamic reassembly of chemically-etched 3D embryonic tissue,” *Biophysical Society 59th Annual Meeting*. Feb 2015.
  5. C. Nehme, A. Sagar, W. Messner, and T. James “Fabrication and investigation of a micro- progressive die set for microforming of sheet metals, *ASME 2014 International Mechanical Engineering Congress and Exposition*, Montreal, Canada, Nov 2014.
  6. JD Taylor and W. Messner, “Loop-shaping for non-minimum phase systems using Contoured Robust Bode plots,” *2014 American Controls Conference*, 2245-2250, Portland, OR, 4-6 Jun 2014.
  7. JD Taylor and W. Messner, “Controller Design for Nonlinear Multi-input/Multi-output Systems Using the Contoured Robust Controller Bode Plot,” *ASME 2013 Dynamic Systems and Control Conference*, 21-32 Oct 2013, Palo Alto, CA.
  8. Y. Krishnamurthy and W. Messner, “Root Locus Design with the CPISL Compensator and the Parallel Inner Loop Form,” *2012 American Controls Conference*, p. 5980-5985, Montreal, Canada, 27-29 Jun 2012.
  9. JD Taylor, I. Gentilini, and W. Messner, “Loop-shaping controller design for nonlinear systems using the robust controller Bode (CRCBode) plot,” *2012 American Controls Conference*, p. 5980-5985, Montreal, Canada, 27-29 Jun 2012.
  10. T. Atsumi and W. Messner, “Suppression of residual vibrations around the sampling frequency,” *IECON 2011*, p. 3436-3441, Melbourne, Australia 7-10 Nov 2011.
  11. T. Atsumi and W. Messner, “Unobservable Settling Vibration on Head-Positioning Control in Hard Disk Drives,” *18th IFAC World Congress*, p. 4052-4060, Milano, Italy, 28 Aug-2 Sep 2011.
  12. J. Taylor and W. Messner, “Controller design for nonlinear systems using the robust controller bode (RCBode) plot,” *2011 American Controls Conference*, p. 1414 - 1419, San Francisco, CA, 29 Jun – 1 Jul 2011.
  13. Q. Zhang and W. Messner, “Root locus design with complex proportional-integral-lead compensation,” *2011 American Controls Conference*, p. 693 - 698, San Francisco, CA, 29 Jun – 1 Jul 2011.
  14. W. Messner, “‘Night Comes to the Cretaceous’ and other tales of the decibel,” *2011 American Controls Conference*, p. 705 - 709, San Francisco, CA, 29 Jun – 1 Jul 2011.

**Round Table Group  
Consultant Curriculum Vitae**

15. T. Atsumi and W. Messner, "Modified Bode Plots for Head-Positioning Control in Hard Disk Drives with Structured and Unstructured Uncertainties," *2010 IFAC Symposium on Mechatronic Systems*, p. 63-70, Cambridge, MA, 13 –15 Sep 2010.
16. T. Atsumi and W. Messner, "Analysis of Residual Vibrations above the Nyquist Frequency in Head-Positioning Control of Hard Disk Drives," *2010 IFAC Symposium on Mechatronic Systems*, p. 76-83, Cambridge, MA, 13 –15 Sep 2010.
17. I. Gentilini, M.-S. Kim, W. Messner, "Control of Lateral Tape Motion Using Extrapolated Position," *2010 International Symposium on Industrial Electronics*, Bari, Italy, 4 Jul – 7 Jul 2010.
18. T. Atsumi, W. Messner, "Estimation of Unobservable Oscillations in Sampled-Data Positioning Systems," *2010 International Symposium on Industrial Electronics*, Bari, Italy, 4 Jun – 7 Jul 2010.
19. T. Atsumi and W. Messner, "Loop-Shaping Controller Design with the RBode Plot for Hard Disk Drives," *2010 American Controls Conference*, p. 2659 – 2664, Baltimore, MD 30 Jun – 2 Jul 2010.
20. W. Messner, "The Decibel and Mr. Dow," *2010 American Controls Conference*, p. 6888 – 6890, Baltimore, MD 30 Jun – 2 Jul 2010.
21. Y.-T. Kim, P.R. LeDuc, W. Messner, "Nonlinear Modeling and Control of a Mechanically Coupled Variable Resistance and Squeeze Pump for Pressure Regulation in Microfluidics," *2010 American Controls Conference*, p. 4199 – 4204, Baltimore, MD 30 Jun – 2 Jul 2010.
22. J.D. Taylor, B. Sinopoli, W. Messner, "Nonlinear Modeling of Butterfly Valves and Flow Rate Control Using the Circle Criterion Bode Plot," *2010 American Controls Conference*, p. 1967-1972, Baltimore, MD, 30 Jun – 2 Jul 2010.
23. M.-S. Kim, I. Gentilini, W. Messner, "Active Tape Edge Position Control System using a Complex Proportional-Integral-Lead Compensator," *2010 American Controls Conference*, p. 2653 – 2658, Baltimore, MD 30 Jun – 2 Jul 2010.
24. T. Atsumi and W. Messner, "Optimization of Head-Positioning Control in a Hard Disk Drive Using the RBode Plot," *2010 Workshop on Advanced Motion Control*, p. 542 – 547, Nagaoka, Japan, 21-24 Mar 2010.
25. W.C. Messner, J.A. Bain, M. Koenders, J. Groenesteijn, G.H.. Marsman, P.J. Gilgunn, G.K. Fedder, "A CMOS-MEMS Rotary Actuator Suitable for Hard Disk Drive Applications." *Transducers 2009 Conference*, p. 1509-12, Denver, CO, 21-25 June 2009.
26. D. Helmick and W. Messner, "Describing Function Analysis of the Dahl Friction Model," *2009 American Control Conference*, St. Louis, MO, p. 814-19, 10-12 June 2009.

**Round Table Group  
Consultant Curriculum Vitae**

27. W. Messner, "Formulas for Asymmetric Lead and Lag Compensators," *2009 American Control Conference*, St. Louis, MO, p. 3769-74, 10-12 June 2009.
28. J.C. Collinger, W.C. Messner, and J.A. Wickert, "Vibration Control with Magnetically Mounted Piezoelectric Actuators," *ASME International Mechanical Engineering Congress and Exposition, Proceedings*, v 11, p 481-488, 2009, Boston, MA.
29. H. Suzuki, W. C. Messner, J. Bain, V. Bhagavatula, and S. Nabavi, "A method for simultaneous position and timing error detection for Bit Patterned Media." Presented at the *2009 Intermag Conference*, Sacramento, CA, 4-8 May 2009.
30. L. Xia and W. Messner, "Active Tape Steering Control System," *Proceedings of the 2008 International Federation of Automatic Control Conference*, Seoul, Korea, 6-11 July 2008.
31. D. Helmick and W. Messner, "Simultaneous Control of a Precision Linear Stage in Multiple Lubrication Regimes with the Complex Lag," *Proceedings of the 2008 American Controls Conference*, Seattle, WA, 11-13 June 2008.
32. L. Xia and W. Messner, "An Improved RBode Plot," *Proceedings of the 2008 American Controls Conference*, Seattle, WA, 11-13 June 2008, p 4940-4945.
33. W. Messner, "Classical Controls Revisited," *Proceedings of the 2008 Advanced Motion Controls Conference*, Trento, Italy, 26-28 March 2008.
34. L. Xia and W. Messner, "Loop Shaping with the Circle Criterion Bode Plot with Applications to Active Tape Steering," *Proceedings of the 2007 American Controls Conference*, New York, NY, p. 37-42, 11-13 July 2007.
35. M. Bedillion and W. Messner, "Distributed Manipulation with an Actuator Array and Vision Feedback," *Proceedings of the 2007 American Controls Conference*, New York, NY, p. 1982-87, 11-13 July 2007.
36. J. Mynderse, W. Messner, and G. Chiu, " $H_\infty$  Loop Shaping Control of a Steering Wheel Simulator Using a Complex Lead Filter," *Proceedings of the 2007 European Control Conference*, Kos, Greece, 2-5 July 2007.
37. M. Bedillion and W. Messner, "Trajectory Following on Actuator Arrays," *Proceedings of the 2006 American Controls Conference*, Minneapolis, MN, 15-16 June 2006.
38. B. Kuczenski, W. Messner, and P. LeDuc, "A Platform for Building PIC Applications for Control and Instrumentation," *Proceedings of the 2005 American Controls Conference*, p. 5162-7, Portland, Oregon, 8-10 June 2005.

**Round Table Group  
Consultant Curriculum Vitae**

39. L. Xia and W. Messner, "Loop Shaping for Robust Performance Using Rbode Plot," *Proceedings of the 2005 American Controls Conference*, Portland, Oregon, v. 2, p. 2869-74, 8-10 June 2005.
40. W. Messner, "Modified PQ Method for Robustness to Microactuator Saturation and Failure," *Proceedings of the 2005 International Federation of Automatic Control Conference*, Prague, Czech Republic, 4-8 July 2005.
41. B. Kuczenski, P. Leduc, and W. Messner, "Automated System for Controlling the Laminar Flow Interface in a Three-Channel Confluent Microfluidic System," *Proceedings of the 2005 International Mechanical Engineering Congress and Exposition*, p. , Anaheim, CA, 13-19 November 2004.
42. C. Drechsler and W. Messner, "Tracking error signal generation for a raster scanned optical disc system," *Proceedings of the 2004 IEEE International Conference on Control Applications* v. 1, p. 539-44, Taipei, Taiwan, 2-4 September 2004.
43. W. Messner and R. Oboe, "Phase Stabilized Design of a Hard Disk Drive Servo Using the Complex Lag Compensator." *Proceedings of the 2004 American Controls Conference*, Boston, MA , v. 2, p. 1165-70, 30 Jun – 2 Jul 2004.
44. D. Helmick and W. Messner, "Higher Order Modeling of Hysteresis in Disk Drive Actuators," *Proceedings of the 2003 Conference on Decision and Control*, p. 3712-6, Maui, HI, 10-12 Dec 2003.
45. M. Bedillion and W. Messner, "The Multivariable Circle Criterion for Switch Continuous Systems," *Proceedings of the 2003 Conference on Decision and Control*, p. 5301-6, Maui, HI, 10-12 Dec 2003.
46. M. Bedillion and W. Messner, "Distributed Manipulation with Stick-Slip Contact," *Proceedings of the 2003 IEEE/RSJ International Conference on Intelligent Robots and Systems*, p. 866-73, Las Vegas, NV, 27-31 Oct 2003.
47. E. Hughes and W. Messner, "Characterization of Three Servo Patterns for Position Error Signal Generation in Hard Drives," *Proceedings of the 2003 American Controls Conference*, p. 4317-22, Denver, CO , 2-4 Jun 2003.
48. M. La Civita, G. Papageorgiou, W. Messner, and T. Kanade, "Integrated Modeling and Robust Control for Full-Envelope Flight of Robotic Helicopters," *2003 IEEE International Conference on Robotics and Automation*, Taipei, Taiwan, 15-19 September 2003. (Best Paper Finalist)
49. M. La Civita, G. Papageorgiou, W. Messner, and T. Kanade, "Design and Flight Testing for an H infinity Gain Scheduled Controller for Wide Envelope Flight of a Robotic Helicopter," *Proceedings of the 2003 American Controls Conference*, v. p. 552-7, Denver, CO, Jun 2003.

## Round Table Group Consultant Curriculum Vitae

50. J. Gamble, E. Hughes, and W. Messner “Analytical Expression for Readback Signal Produced by a GMR Read Sensor Passing Over a Slanted Magnetic Transition,” Digest of the *INTERMAG 2003 International Magnetics Conference*, p. FE-10, 31 Mar - 4 Apr 2003.
51. M. Bedillion and W. Messner, “Rolling Contact Operation of the Modular Distributed Manipulator System,” Presented at the *2002 Workshop on Algorithmic Foundations of Robotics*, Nice, France, 16-17 Dec. 2002.
52. M. Karaman and W. Messner “Robust dual stage HDD track follow control systems design for hand-off shaping,” *Digest of the 2002 Asia-Pacific Magnetic Recording Conference*, p. Ba5-01-Ba5-02, Singapore, 27-29 Aug 2002.
53. M. La Civita, M. Tischler, W. Messner, and T. Kanade, “Modeling of Small-Scale Helicopters with Integrated Physics-Based Simulation and System Identification Techniques,” *Proceedings of the 58<sup>th</sup> Forum of the American Helicopter Society*, p. 2505- 2516, Montréal, Quebec, Canada 11-13 Jun 2002.
54. C. Smith and W. Messner, “Loop shaping with closed-loop magnitude contours on the Bode plot,” *Proceedings of 2002 American Control Conference*, 2747-52, Anchorage, AK, 8-10 May 2002.
55. C. Smith and W. Messner, “Loop shaping with closed-loop magnitude contours on the Bode plot,” *Proceedings of 2002 American Control Conference*, 2747-52, Anchorage, AK, 8-10 May 2002
56. M. Bedillion, W. Messner, H. Choset, “Limitations Imposed by Single DOF Actuators on Discrete Actuator Arrays,” *Proceedings 2001 IEEE/RSJ International Conference on Intelligent Robots and Systems*, p. 189-94, Maui, HI, 29 Oct.-3 Nov. 2001
57. J. Luntz, and W. Messner, “Dynamics and Control of Discrete Distributed Manipulation,” *Proceedings of the 2001 IEEE International Conference on Control Applications*, p. 1111- 16, Mexico City, Mexico, 5-7 Sep. 2001.
58. Y. Lu and W. Messner, “Robust servo design for tape transport,” *Proceedings of the 2001 IEEE International Conference on Control Applications*, p. 1014-19, Mexico City, Mexico, 5-7 Sep 2001.
59. W. Messner and H. Shragai. “Loop Shaping Controller Design Using the Sode Plot,” *Proceedings of the 2001 American Control*, p. 2792-6, Arlington, VA, 25-27 Jun 2001.
60. W. Messner and R. Ehrlich, “A Tutorial on Controls for Disk Drives,” *Proceedings of the 2001 American Control*, p. 408-20, Arlington, VA, 25-27 Jun 2001.
61. Y. Lu and W. Messner, “Disturbance Observer Design for Tape Transport Control,”

**Round Table Group  
Consultant Curriculum Vitae**

- Proceedings of the 2001 American Control*, p. 2567-71, Arlington, VA, 25-27 Jun 2001.
62. B.F. Mettler, M.B. Tischler, T. Kanade, and W.C. Messner, "Attitude Control Optimization for a Small Scale Unmanned Helicopter," *Proceedings of AIAA Guidance, Navigation, and Control Conference*, Denver, CO, 14-17 August 2000.
63. Y. Lu and W. Messner, "Advanced Servo Design for Tape Transport," *Proceedings of the Fourth World Multi-Conference on Systemics, Cybernetics, and Informatics*, Orlando, FL, 23-26 July 2000.
64. W. Messner, "The Development, Properties, and Application of the Complex Phase Lead Compensator," *Proceedings of the 2000 American Controls Conference*, p. 2621-6, Chicago, IL, 28-30 July 2000.
65. B. Gong, W. Messner, T. E. Schlesinger, H. Shragai, D. Stancil, and J. Zhai, "Ultra-high Performance Optical Servo System Using an Electrooptic Beam Scanner," *Proceedings of the SPIE Optical Data Storage Conference*, 335-9, Whistler, British Columbia, Canada, 14- 17 May 2000.
66. J. Luntz, W. Messner, and H. Choset, "Closed Loop Operation of Actuator Arrays," *Proceedings of the 2000 International Conference on Robotics and Automation*, p. 3666-72, San Francisco, CA, 24-28 April 2000.
67. J. Zhai, S. Schroeck, Y. Huang, W. Messner, T. E. Schlesinger, and D. Stancil, "Electro-optic Scanner for Optical Fine Tracking System," *Proceedings of the SPIE Optical Data Storage Conference*, 194-201, Denver, CO, 21-22 July 1999.
68. Y. Huang, P. Mathur, and W. Messner, "Robustness Analysis on a High Bandwidth Instrumented Suspension," *Proceedings of the 1999 American Controls Conference*, San Diego, CA, 2-4 June 1999.
69. J. Luntz, H. Choset, and W. Messner, "Discrete Actuator Array Vector Field Design," *1999 Proceedings of the International Conference on Robotics and Automation*, p. 2235-41, Detroit, MI, 9-15 May 1999.
70. J. Luntz, H. Choset, and W. Messner, "Open-Loop Orientability of Objects on Actuator Arrays," *Proceedings of the 1999 International Conference on Robotics and Automation*, p. 2242-48, Detroit, MI, 9-15 May 1999.
71. S. Schroeck, W. Messner, "On Controller Design for Linear Time-Invariant Dual-Input Single-Output Systems," *Proceedings of the 1999 American Controls Conference*, San Diego, CA, 2-4 June 1999.
72. J. Luntz, H. Choset, and W. Messner, "Open-Loop Orientability of Objects on Actuator Arrays," *Proceedings of the 1999 International Conference on Robotics and Automation*, Detroit, MI, 9-15 May 1999.

### Round Table Group Consultant Curriculum Vitae

73. D. Tilbury and W. Messner, "Control Education on the WWW: Using MATLAB for Control Design, Simulation, and Visualization," *Proceedings of the 1998 International Mechanical Engineering Congress and Exposition*, Anaheim, CA, 15-12 November 1998
74. W. Doggett, W. Messner, and J-N. Juang, "Planning Paths Through Singularities in the Center of Mass Space," *1998 AIAA Guidance, Navigation, and Control Conference*, Boston, MA, 10-12 August 1998.
75. M. Banther, Y. Huang, W. Messner, "Optimal Strain Gauge Placement for an Instrumented Disk Drive Suspension," *1998 American Controls Conference*, Philadelphia, PA, 24-26 June 1998.
76. J. Luntz, W. Messner, and D. Tilbury, "Controls Tutorials for MATLAB and Simulink," *1998 American Controls Conference*, Philadelphia, PA, 24-26 July 1998.
77. D. Smith, R. Devireddy, W. Messner, and J. Bischof, "Web/Internet-based Cryobiology Modeling Tutorial," *CRYO '98*, Pittsburgh, PA, 11-16 July 1998.
78. J. Luntz, W. Messner, and D. Tilbury, "Web Technology for Controls Education," *Proceedings of the 1997 Conference on Decision and Control*, San Diego, CA, 10-12 December 1997.
79. D. Tilbury and W. Messner, "Development and Integration of Web-based Software Tutorials for Undergraduate Curriculum: Control Tutorials for MATLAB," *Proceeding of the 1997 Frontiers in Education Conference*, Pittsburgh, PA, 7 November 1997.
80. J. Luntz, W. Messner, and H. Choset, "Parcel Manipulation and Dynamics with a Distributed Actuator Array," *Proceeding of the 1997 IEEE International Conference on Robotics and Automation*, Albuquerque NM, 14-15 Oct 1997.
81. Y. Huang and W. Messner, "Feedforward Algorithms for Time-Optimal Settling of Hard Disk Drive Servo Systems," *Proceeding of IECON 97*, New Orleans, LA, 9-11 November 1997.
82. D. Tilbury and W. Messner, "A Case Study for Software Education Over the World Wide Web: The Michigan-CMU Control Tutorials for MATLAB," *Proceedings of the 1997 ASEE Conference*, Milwaukee WI, 15-18 June 1997.
83. J. Pagel, Y. Sun, D. Tilbury, L. Oms, M. Suri, and W. Messner, "Controls Tutorials for MATLAB on the World Wide Web," *Proceedings of the 1997 American Controls Conference*, Albuquerque NM, 4-6 June 1997.
84. J. Luntz, W. Messner, and H. Choset, "Parcel Manipulation and Dynamics with a Distributed Actuator Array," *Proceedings of the 1997 IEEE International Conference on Robotics and Automation*, Albuquerque NM, 20-24 April 1997. Finalist for Best Paper.

**Round Table Group  
Consultant Curriculum Vitae**

85. P. Mathur and W. Messner, "Frequency Domain Characterization of Take-up Reel Air Entrainment in High-Speed Low-Tension Tape Transport," *Proceedings of the 1996 ASME International Mechanical Engineering Conference and Exposition*, Atlanta, GA, 17-22 November 1996.
86. J. Luntz and W. Messner, "Networking and Communication Language for the Virtual Vehicle: A Highly Distributed Coordination Control System," *Proceedings of the 1996 IEEE Symposium on Intelligent Control*, p. 230-5, Dearborn, MI, 14-18 Sep 1996.
87. J. Luntz and W. Messner, "The Virtual Vehicle: A Materials Handling System Using Highly Distributed Actuation and Control," *Proceedings of the 1996 Japan - U.S.A. Symposium on Flexible Automation*, Boston MA, 7-10 July 1996.
88. K. Eddy and W. Messner, "Disk Drive Actuator Bias: Prediction and Compensation," *Proceedings of the 1996 International Federation of Automatic Control Conference*, San Francisco, CA, 30 June - 5 July 1996.
89. W. Doggett, W. Messner, and J.-N. Juang, "Global Minimization of Base Reaction Forces During Point to Point Moves," *Proceedings of the 1996 AIAA Guidance, Navigation, and Control Conference*, San Diego, CA, 29-31 July.
90. K. Eddy and W. Messner, "A State Space Model for Prediction of Actuator Tracking Bias in Hard Disk Drives," *Proceedings of the 1995 ASME International Mechanical Engineering Congress and Exposition, ISPS-2*, San Francisco, CA, Nov 1995.
91. J. Luntz, Eric Rollins, and W. Messner, "The Virtual Vehicle: A Materials Handling System Using Highly Distributed Coordination Control," *Proceedings of the 1995 IEEE Conference on Controls Applications*, p. 742-7, Albany, NY, Sep 1996.
92. J. Luntz and W. Messner, "Work on a Highly Distributed Coordination Control System," *Proceedings of the 1995 American Control Conference*, v. 4, p. 2838-42, Seattle, WA, 21-23 Jun 1995.
93. K. Eddy and W. Messner, "Effects of Bearing Dynamics on Tracking Bias in Disk Drive Rotary Actuators," *Proceedings of the 1995 American Control Conference*, Seattle, WA, 21- 23 June, 1995.
94. W. Messner, "Two Adaptive Algorithms for Discrete-Time Repetitive Control Viewed as Cases of the Internal Model Principle," *Proceedings of the ASME Winter Annual Meeting*, New Orleans, LA, November 1993.
95. R. Horowitz and W. Messner, "Learning Optimal Control Using Integral Equations," *Proceedings of the 1991 American Controls Conference*, Boston, MA, June 1991.
96. R. Horowitz, W. Messner, J. Moore, and W. Kao, "Convergence Properties of Learning

## **Round Table Group Consultant Curriculum Vitae**

Controllers for Robot Manipulators," *Proceedings of the 1990 Japan - U.S.A. Symposium on Flexible Automation*, July 1990.

97. J. Moore, R. Horowitz, and W. Messner, "Functional Persistence of Excitation and Observability," *Proceedings of the 1990 American Controls Conference* v. 114, n. 3, p. 308- 14, San Diego, CA, 23-25 May 1990.

### **Invited Papers**

1. P. Mathur and W. Messner, "Survey of Digital Tape Transport Servo Systems," *Proceedings of the 1995 SPIE Conference*, Philadelphia, PA, 23-27 October 1995.

### **Other Publications**

1. G. Cherubini, C. Chung, W. Messner, S. Moheimani, "Guest Editorial Introduction to the Special Section on Advanced Servo Control for Emerging Data Storage Systems," *IEEE Transactions on Control System Technology*, v. 20, n. 2, p. 292-295, Mar. 2012.
2. W. Messner and C. Kempf, "A Comparison of Four Discrete-Time Repetitive Control Algorithms," *Technical Report*, UC Berkeley Computer Mechanics Laboratory, December 1991. (Note: an abridged version of this report with different authors appeared in *IEEE Control Systems Magazine*, December 1993. See above.)
3. W. Messner, "Learning Control," *Ph.D. Dissertation*, Department of Mechanical Engineering, University of California, Berkeley, December 1992.

### **PROFESSIONAL SERVICE**

Local Outreach Co-Chair, 2016 American Controls Conference, Boston, MA, 6-8 July 2016

Organizer, *New Devices*, Special Session at the *Tufts World Health Day Conference*, 8 Apr 2013.

Program Co-Chair, 2013 International Conference on Mechatronics, Vicenza, Italy, 27 Feb – 1 Mar 2013.

Organizer, *Do's and Don't's of Teaching Control*, Special Session on Education at the 2012 American Controls Conference.

Associate Editor for *International Journal of Automation and Smart Technology*. 2012.

Guest Associate Editor for special issue on current and emerging data storage in *IEEE Transactions on Control Systems Technology*.

Organizer, *Autonomous Vehicle Technologies*, SAE Symposium, Carnegie Mellon University, 9- 10 August 2011.

Participant *NSF Workshop on Building Systems*, University of Illinois, Urban-Champaign, 24-

## **Round Table Group Consultant Curriculum Vitae**

25 May 2010.

Organizer, *Automation on the Move: Driver Assist and Autonomous Vehicle Technologies*, SAE Symposium, Carnegie Mellon University, 4-6 June 2008.

Master of Ceremonies, DARPA Urban Challenge Site Visit, 17 June 2008, Pittsburgh, PA.

Organizer, SAE Driver Assist and Autonomous Vehicle Technologies Symposium, Carnegie Mellon University, 14-15 June 2005.

Editor for *IEEE Transactions on Magnetics* (2002-2007)

Associate Editor for Journal of Information Storage and Processing Systems (1999-2003)

Co-Organizer, SAE Nanotechnology—Inner Values Symposium, Carnegie Mellon University, 11-12 May 2004.

Session Chair for Recording Systems--Mechanical Session at InterMag 2002 Conference, Amsterdam, Netherlands, 28 April – 2 May 2002.

Co-Organizer, First Carnegie Mellon Workshop on Interdisciplinary Nanotechnology Research, 20-21 September 2001.

Session Chair for Recording Systems--Mechanical Session at InterMag 2000 Conference, Toronto, ON, Canada, 9-13 April 2000.

Guest Editor for Special Focused Issue on Disk Drives of *IEEE/ASME Transactions on Mechatronics*, September 1998.

Session Chair for Servo Systems and Components Sessions at 7th Joint InterMag/MMM Conference San Francisco, CA, 6-9 January 1998.

Chairman and organizer for Servo-Control and Track Misregistration, 1995 and 1998 Asia Pacific Magnetic Recording Conferences

Organizer and Chair for invited sessions on control for data storage at the 1994—2001, 2003, 2004, 2006, and 2007 American Control Conferences and the 1996 and 2002 International Federation of Automatic Control Conference.

Judge, INTEL International Science Fair, 2012

### **STUDENTS ADVISED**

Ph.D.

*Tufts*

Kentaro Barhydt, expected May 2022 (Co-advised with Karen Panetta)

Whitney Crooks, May 2017 (co-advised with Chris Rogers)

**Confidential Resume of William C. Messner, PhD**

Printed: 09/21/19

Page 33

## Round Table Group Consultant Curriculum Vitae

Piers Echols-Jones, expected Dec 2019 (co-advised with Igor Sokolov)

Chris Nehme, February 2017

### *Carnegie Mellon*

Mark Bedillion, graduated December 2005

Matthew Brake, graduated December 2007 (co-advised with Prof. Jonathan Wickert) John Collinger, graduated December 2008 (co-advised with Prof.

Jonathan Wickert) William Doggett, graduated December 1999

Lina Gonzales, graduated May 2014 (co-advised with Prof. Philip

LeDuc) Melis Hazar, graduated Dec 2014 (co-advised with Prof. Philip

LeDuc) Daniel Helmick, graduated December 2008

Yuhong Huang, graduated May 1999

Casey Kute (left program June 2011) (co-advised with Prof. Jessica

Hodgins) Marco La Civita, graduated May 2003

Yong-tae Kim (co-advised with Prof. Philip LeDuc)

Brandon Kuczenski, May 2008 (co-advised with Prof. Philip

LeDuc) Innam Lee, left program 2006

Xiangdong Lin, graduated August 2000, (co-advised with Prof. Jian-Gang

Zhu) Yan Lu, graduated December 2001

Jonathan Luntz, graduated August 1999 Priyadarshree Mathur, graduated May 1999

Scott Moreland, August 2013 (co-advised with Dr. David Wettergreen)

Alexei Sacks, graduated August 1995

J.D. Taylor, graduated, Aug 2014

Lu Xia, graduated December 2007

### M.S.

#### *Tufts*

Fangzheng Guo, May 2017

Charles Frankel, Dec 2019

Brooke Longo, May 2019

Chris Nehme, February 2014 (co-advised with Tom James)

Chris Smith, May 2014 (co-advised with Chris Rogers)

Peter Tsvivis, expected Dec 2019

Chenlu Wu, May 2019

Luqi Yan, May 2015

Jiabin Zhang, expected February 2017

Susan Zheng, August 2015 (co-advised with Tom James)

Yiran Zuo, May 2019

### *Carnegie Mellon*

Andrew Baldwin, graduated May 2008

Michael Banther, graduated May 1997

Gwendolyn Barr, graduated May 2010

Mark Bedillion, graduated May 2001

Chih-Yang Chang, expected completion May 2009

Corey Drechsler, graduated, December 2004

**Round Table Group  
Consultant Curriculum Vitae**

Kyle Eddy, graduated December 1994  
Bo Gong, graduated May 2001  
Daniel Helmick, graduated December 2004  
Eric Hughes, graduated December 2002  
Brian Kliethermes, graduated December 2009  
Brandon Kuczenski, graduated May 2005  
Xiao Li, graduated completion May 2013  
Mithran Mathew, graduated May 1997  
Scott Moreland, graduated May 2009  
Priyadarshee Mathur, graduated December 1994  
Holly Rapley  
Eric Rollins, graduated May 1997  
Hadas Shragai, graduated August 2001  
Steven Schroeck, graduated May 1999  
John Steele, graduated May 1997  
Boweï Tang, graduated December 2012  
Xingrui Yin, graduated May 2013

---

---

**Round Table Group**

Phone: 202-908-4500

E-mail: [expertassistance@roundtablegroup.com](mailto:expertassistance@roundtablegroup.com)