Mark B. Colton

Department of Mechanical Engineering, Brigham Young University
435 CTB • Provo, Utah 84602 • 801-422-6303 • colton@byu.edu

Areas of Expertise

Dynamic systems, mechatronic systems, robotics, instrumentation and measurements

Professional Experience

Teaching Professor, Brigham Young University, 2021 – Present
Associate Teaching Professor, Brigham Young University, 2016 – 2021
Associate Professor, Brigham Young University, 2012 – 2016
Assistant Professor, Brigham Young University, 2006 – 2012
Visiting Instructor, Brigham Young University, 2005 – 2006
Research Assistant, University of Utah Virtual Environments and Teleoperation (VETO) Lab, 2001 – 2005
Research Staff, Sarcos, Inc./Center for Engineering Design, 1998 – 2001
Mechanical Engineer, Sarcos, Inc., 1997
Student Engineer, Sarcos, Inc., 1994 – 1997

Education

Ph.D., University of Utah, Mechanical Engineering, August 2006
Dissertation: "Reality-Based Modeling of Nonlinear Passive Devices for Haptic Simulations"
Advisor: John M. Hollerbach

M.S., University of Utah, Mechanical Engineering, May 2001
Thesis: "An Experimental Neuroelectric Prosthetic Arm Control System"
Advisor: Sanford G. Meek

B.S., University of Utah, Mechanical Engineering, June 1997

Courses Taught

Brigham Young University

MeEn 191 – New Student Seminar (7 semesters)
MeEn 204 – Dynamics (1 semester)
MeEn 273 – Introduction to Scientific Computing and Computer-Aided Engineering (8 semesters)
MeEn 330 – Design of Mechatronic Systems (15 semesters)
MeEn 335 – Dynamic System Modeling and Analysis (8 semesters)
MeEn 363 – Elementary Instrumentation (5 semesters)
MeEn 431/ECEn 483 – Design of Control Systems (1 semester)
MeEn 479 – Fundamentals of International Product Development in Singapore (5 semesters)
MeEn 497R – Mechatronics Projects (5 semesters)
MeEn 534 – Dynamics of Mechanical Systems (16 semesters)
MeEn 633/ECEn 673 – Design of Digital Control Systems (3 semesters)
MeEn 475/476 – Capstone Coach (15 teams)
ECEn 493R – Quadrotor Laboratory (1 semester)

University of Utah

MeEn 1300 – Statics and Strength of Materials (3 semesters)
MeEn 2040 – Numerical Methods (2 semesters)

MeEn 2400 – Dynamics (1 semester)
MeEn 5410/6410 – Intermediate Dynamics (2 semesters)

University of Utah – Teaching Assistant
MeEn 1300 – Statics and Strength of Materials
MeEn 231 – Strength of Materials I
MeEn 2400 – Dynamics
MeEn 318, 319, 320 – Mechatronics Laboratory
MeEn 350 – Fluid Mechanics I Laboratory

Publications

T.E. Greenwood, S.E. Hatch, M.B. Colton, and S.L. Thomson, "3D Printing Low-Stiffness Silicone Within a Curable Support Matrix," *Additive Manufacturing*, Vol. 37, 2021.

R.G.T. Romero, M.B. Colton, and S.L. Thomson, "3D-Printed Synthetic Vocal Fold Models," *Journal of Voice*, Journal of Voice, Vol. 35, No. 5, 2021, pp. 685-694.

S.J. McDonald, M.B. Colton, C.K. Alder, and M.A. Goodrich, "Haptic Shape-Based Management of Robot Teams in Cordon and Patrol," *ACM/IEEE International Conference on Human-Robot Interaction*, Vienna, Austria, 6-9 March 2017.

R. Philbrick and M. Colton, "Effects of Haptic and 3D Audio Feedback on Operator Performance and Workload for Quadrotor UAVs in Indoor Environments," *Journal of Robotics and Mechatronics*, Vol. 26, No. 5, 2014, pp. 580-591.

R.B. George, M.B. Colton, C.A. Mattson, and S.L. Thomson, "A Differentially Driven Flapping Wing Mechanism for Force Analysis and Trajectory Optimization," *Int. Journal of Micro Air Vehicles*, Vol. 4, No. 1, 2012, pp. 31-49.

M.A. Goodrich, M.B. Colton, B. Brinton, M. Fujiki, J.A. Atherton, D. Ricks, M.H. Maxfield, A. Acerson, "Incorporating a Robot into an Autism Therapy Team," *IEEE Intelligent Systems*, Vol. 27, No. 2, 2012, pp. 52-59.

M.B. Colton, L. Sun, D.C. Carlson, and R.W. Beard, "Multi-vehicle Dynamics and Control for Aerial Recovery of Micro Air Vehicles," *Int. Journal of Vehicle Autonomous Systems*, Vol. 9, Nos. 1/2, 2011, pp. 78-107.

P. Willemsen, M.B. Colton, S.H. Creem-Regher, and W.B. Thompson, "The Effects of Head-Mounted Display Mechanical Properties and Field-of-View on Distance Judgments in Virtual Environments," *ACM Trans. on Applied perception*, Vol. 6, No. 2, February 2009, pp. 8:1-8:14.

P. Willemsen, S.H. Creem-Regehr, M.B. Colton, and W.B. Thompson, "The Effect of HMD Mass and Inertia on Visually Directed Walking in Virtual Environments," *Journal of Vision*, Vol. 5, p. 309, 2005.

P. Willemsen, M.B. Colton, S.H. Creem-Regehr, and W.B. Thompson, "Examining Distance Compression in Virtual Environments: Hi-tech versus No-tech Displays," *Journal of Vision*, Vol. 4, No. 8, p. 20, 2004.

R.G.T. Romero, T.E. Greenwood, C.A. Young, S. Hatch, M.B. Colton, and S.L. Thomson, "Development and Analysis of 3D-Printed Synthetic Vocal Fold Models," *11th Int. Conf. on Voice Physiology and Biomechanics*, 1-3 August, 2018.

C.K. Alder, S.J. McDonald, M.B. Colton, and M.A. Goodrich, "Toward Haptic-Based Management of Small Swarms in Cordon and Patrol," *IEEE Swarm/Human Blended Intelligence Workshop*, Cleveland, Ohio, 28-29 September, 2015.

J.C. Hawks, M.B. Colton, and L.L. Howell, "A Variable-Stiffness Straight-Line Compliant Mechanism," *Proc. ASME International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (IDETC/CIE)*, Boston, Massachusetts, 2-5 August, 2015.

E.G. Merriam, M.B. Colton, S. Magleby, and L.L. Howell, "The design of a fully compliant statically balanced mechanism," *Proc. ASME International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (IDETC/CIE)*, Portland, Oregon, 4-7 August, 2013.

M.L. Duffield, C.A. Mattson, and M.B. Colton, “Towards Variable Fidelity Optimization with Hardware in the Loop for Flapping Flight,” *AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference (MAO12)*, Indianapolis, Indiana, 17-19 September, 2012.

L.C. Leishman and M.B. Colton, "A Pseudo-Rigid-Body Model Approach for the Design of Compliant Mechanism Springs for Prescribed Force-Deflections," *ASME Design Engineering Technical Conference*, Washington, D.C., 28-31 August, 2011.

M.A. Owen, J.W. Nicols, and M.B. Colton, "Cooperative Aerial Tracking and Rendezvous Along Time-Optimal 3-Dimensional Curves," *AIAA Guidance, Navigation, and Control Conference (GNC11)*, Portland, Oregon, 8-11 August, 2011.

M.A. Goodrich, M.B. Colton, B. Brinton, and M. Fujiki, “A Case for Low-Dose Robotics in Autism Therapy,” *6th ACM/IEEE International Conference on Human-Robot Interaction (HRI11)*, Lausanne, Switzerland, 6-9 March, 2011.

D.J. Ricks, M.B. Colton, and M.A. Goodrich, “Design and Evaluation of a Clinical Upper-Body Humanoid Robot for Autism Therapy,” *Proc. International Conference on Applied Bionics and Biomechanics (ICABB10)*, Venice, Italy, 14-16 October, 2010.

N. Giullian, D. Ricks, A. Atherton, M. Colton, M. Goodrich, and B. Brinton, "Detailed Requirements for Robots in Autism Therapy*," Proc. IEEE International Conference on Systems, Man, and Cybernetics (SMC10)*, Istanbul, Turkey, 10-13 October, 2010.

A.M. Brandt and M.B. Colton, "Haptic Collision Avoidance for a Remotely Operated Quadrotor UAV in Indoor Environments," *Proc. IEEE International Conference on Systems, Man, and Cybernetics (SMC10)*, Istanbul, Turkey, 10-13 October, 2010.

L. Sun, R.W. Beard and M.B. Colton, "Motion Planning and Control for Mothership-cable-drogue Systems in Aerial Recovery of Micro Air Vehicles," *Proc. American Control Conference (ACC10)*, Baltimore, Maryland, 30 June-2 July, 2010.

L.C. Leishman, D.J. Ricks, and M.B. Colton, "Design and Evaluation of Statically Balanced Compliant Mechanisms for Haptic Interfaces," *Proc. ASME Dynamic Systems and Control Conference (DSC10)*, Cambridge, Massachusetts, 13-15 September, 2010.

D.J. Ricks and M.B. Colton, "Trends and Considerations in Robot-Assisted Autism Therapy," *Proc. IEEE International Conference on Robotics and Automation (ICRA10)*, Anchorage, Alaska, 3-7 May, 2010.

D.C. Carlson and M.B. Colton, "Out-of-Plane Orbit Estimation and Tracking for Aerial Recovery of Micro Air Vehicles," *Proc. IEEE International Conference on Robotics and Automation (ICRA10)*, Anchorage, Alaska, 3-7 May, 2010.

L. Sun, R.W. Beard, M.B. Colton and T.W. McLain, “Dynamics and Control of Cable-Drogue System in Aerial Recovery of Micro Air Vehicles Based on Gauss’s Principle,” *American Control Conference (ACC09)*, St. Louis, Missouri, 10-12 June, 2009, pp. 4729-4734.

M.B. Colton, D.J. Ricks, M.A. Goodrich, B. Dariush, K. Fujimura and M. Fujiki, "Toward Therapist-in-the-Loop Assistive Robotics for Children with Autism and Specific Language Impairment*," AISB New Frontiers in Human-Robot Interaction Symposium*, Edinburgh, Scotland, 6-10 April, 2009.

M.A. Judd, T.L. Brown, and M.B. Colton, “Toward Automated Haptic Modeling Using Commercial Haptic Interfaces: Surface Normal Estimation and Static Model Identification,” *WorldHaptics 2009: 3rd Joint EuroHaptics Conference and IEEE Symposium on Haptic Interfaces for Virtual Environments and Teleoperator Systems*, Salt Lake City, Utah, 18-20 March, 2009, pp. 434-439.

P.A. Theodosis and M.B. Colton, “Data-Driven Haptic Modeling Using Polynomial Hypersurfaces,” *WorldHaptics 2009: 3rd Joint EuroHaptics Conference and IEEE Symposium on Haptic Interfaces for Virtual Environments and Teleoperator Systems*, Salt Lake City, Utah, 18-20 March, 2009, pp. 35-38.

S.L. Thomson, C.A. Mattson, M.B. Colton, S.P. Harston, D.C. Carlson, and M. Cutler, “Experiment-Based Optimization of Flapping Wing Kinematics,” *Proc. 47th AIAA Aerospace Sciences Meeting*, Orlando, Florida, 5-8 Jan., 2009.

M.A. Judd and M.B. Colton, “Higher-Order Experimental Haptic Force Models of Mechanical Devices Using Moving Ridge Regression,” *Proc. 1st Annual ASME Dynamic Systems and Control Conference (DSC08)*, Ann Arbor, Michigan, 20-22 October, 2008.

M.B. Colton and P.A. Theodosis, “Haptic Modeling for Virtual Design and Prototyping,” *Proc. 2nd International Workshop on Virtual Manufacturing (VIRMAN08)*, Torino, Italy, 6-8 October, 2008.

A.M. Brandt and M.B. Colton, “Toys in the Classroom: LEGO MindStorms as an Educational Haptics Platform,” *Proc. 16th IEEE Symposium on Haptic Interfaces for Virtual Environments and Teleoperator Systems*, Reno, Nevada, 13-14 March, 2008, pp. 389-395.

M.B. Colton and J.M. Hollerbach, “Reality-Based Haptic Force Models of Buttons and Switches,” *Proc. IEEE International Conference on Robotics and Automation (ICRA07)*, Rome, Italy, 10-14 April, 2007, pp. 497-502.

M.B. Colton and J.M. Hollerbach, “Haptic Models of an Automotive Turn-Signal Switch: Identification and Playback Results,” *Proc. WorldHaptics 2007: 2nd Joint EuroHaptics Conference and IEEE Symposium on Haptic Interfaces for Virtual Environments and Teleoperator Systems*, Tsukuba, Japan, 22-24 March, 2007, pp. 243-248.

M.B. Colton and J.M. Hollerbach, “Identification of Nonlinear Passive Devices for Haptic Simulations,” *Proc. WorldHaptics 2005: 1st Joint EuroHaptics Conference and IEEE Symposium on Haptic Interfaces for Virtual Environments and Teleoperator Systems*, Pisa, Italy, 18-20 March, 2005, pp. 363-368.

M.B. Colton and J.M. Hollerbach, “Automated Modeling of Nonlinear Mechanisms for Virtual Prototyping,” *ASME International Design and Engineering Technical Conference (IDETC04), Proc. Biennial Mechanisms and Robotics Conference*, Salt Lake City, Utah, 28 September-2 October, 2004.

P. Willemsen, M.B. Colton, S.H. Creem-Regehr, and W.B. Thompson, “The Effects of Head-Mounted Display Mechanics on Distance Judgements in Virtual Environments,” *Proc. 1st ACM Symposium on Applied Perception in Graphics and Visualization (APGV04)*, Los Angeles, California, 7-8 August, 2004, pp. 35-48.

M.B. Colton and S.G. Meek, “An Experimental Neuroelectric Prosthetic Arm,” *Proc. 2nd IFAC Conference on Mechatronic Systems*, Berkeley, California, December 2002, pp. 336-341.

M.B. Colton, W. Decker, and J. Klewicki, “Inflectional Profile Boundary Layer Interaction with a Surface Mounted Circular Cylinder,” *ASME International Mechanical Engineering Conference and Exposition (IMECE96), Proc. Fluid Engineering Division*, Atlanta, Georgia, 1996, pp. 337-341.

M.B. Colton and T.W. McLain, "Mechatronics at BYU: A New Course for Undergraduate Mechanical Engineers," *ASEE Rocky Mountain Section Conference*, Cedar City, Utah, 30 September-1 October, 2016.

B. Brinton, M. Fujiki, T. Whitmer, M. Goodrich, and M. Colton, "Incorporating a Robot in Intervention with Children with ASD: The Effect on Tantrum Behaviors," *Convention of the American Speech-Language-Hearing Association*, Orlando, Florida, November, 2014.

B. Brinton, M. Colton, M. Fujiki, M. Goodrich, L. Robinson, S. Richie, and K. Lowe, "Using a Humanoid Robot to Facilitate Social Interaction in Children with ASD ," *Convention of the American Speech-Language-Hearing Association*, Chicago, Illinois, November, 2013.

B. Brinton, M. Colton, M. Fujiki, M. Goodrich, L. Robinson, S. Richie, and K. Lowe, "Using Robots to Increase Social Engagement in Children with ASD," *Convention of the American Speech-Language-Hearing Association*, Atlanta, Georgia, November, 2012.

B. Brinton, M. Fujiki, A. Acerson, M. Maxfield, L. Robinson, M. Colton, M. Goodrich, A. Atherton, and D. Ricks, "Enhancing Social Engagement in Two Children with Autism Spectrum Disorder: The Effects of a Lose-Dose Intervention Program Using a Humanoid Robot," *Symposium for Research on Child Language Disorders*, Madison, Wisconsin, June, 2011.

B. Brinton, L. Robinson, M. Fujiki, A. Acerson, M. Hansen, M. Colton, M. Goodrich, A. Atherton, and D. Ricks, "Enhancing Social Engagement in Children with ADS: Using a Robot," *Convention of the American Speech-Language-Hearing Association*, San Diego, California, November, 2011.

R. George, S. Thomson, C. Mattson, M. Colton, and M. Tree, "Optimization of Kinematics of a Flapping Wing Mechanism," *63rd Annual Meeting of the American Physical Society Division of Fluid Dynamics*, Long Beach, California, 21-23 November, 2010.

P. Willemsen, S. Creem-Regehr, M. Colton, and W. Thompson, "The effect of HMD mass and inertia on visually directed walking in virtual environments," *5th Annual Meeting of the Vision Sciences Society*, Sarasota, Florida, May, 2005.

M.B. Colton, “Haptics and Robotics Research at BYU,” *Summer School on Soft Robotics*, Zurich, Switzerland, 18-22 June, 2012.

J.M. Hollerbach, E. Cohen, W.B. Thompson, D.E. Johnson, P. Willemsen, and M.B. Colton, “Virtual Prototyping for Human-Centric Design,” *National Science Foundation Design and Manufacturing Research Conference*, Birmingham, Alabama, 2003.

M.B. Colton, "Reality-Based Modeling of Nonlinear Passive Devices for Haptic Simulations," PhD Dissertation, University of Utah, Salt Lake City, Utah, 2006.

M.B. Colton, "An Experimental Neuroelectric Prosthetic Arm Control System," M.S. Thesis, University of Utah, Salt Lake City, Utah, 2001.

External Research Awards

M.B. Colton and M.A. Goodrich, "Toward Heads-Up Management of Micro-Robot Teams," Army Research Lab Award W911NF-14-1-0633, 9/8/14-3/31/16. $99,833.

S.L. Thomson, M.B. Colton, and C.A. Mattson, “Experimental Analysis of Intermittent Flapping Flight,” AFOSR Award FA9550-10-1-0334, 7/1/10-6/30/13. $309,445.

R.W. Beard, M.B. Colton, and T.W. McLain, “Aerial Recovery of Micro Air Vehicles,” AFOSR STTR-Phase II with Procerus Technologies, 1/10 – 12/11. Total: $750,000. BYU Portion: $449,987.

M.B. Colton and M.A. Goodrich, “Socially Assistive Robotics for Children with Autism: Imitation Capture-Based Robot Programming,” Honda Research Institute, USA, 11/1/10-12/31/11. $60,000.

M.B. Colton, M.A. Goodrich, M. Fujiki, and B. Brinton, “Assistive Robotics for Children with Learning and Social Disabilities,” Honda Research Institute, USA – Honda Initiation Grant, 11/1/08 – 12/31/09. $50,000.

R.W. Beard, M.B. Colton, and T.W. McLain, “Aerial Recovery of Micro Air Vehicles,” AFOSR STTR-Phase I with Procerus Technologies, 11/15/08 – 8/15/09. Total: $100,000. BYU Portion: $58,950.

T.W. McLain, R.W. Beard, M.B. Colton, M.A. Goodrich, and C.N. Taylor, "Collaborative Research: Planning Grant: I/UCRC for Unmanned Aircraft Systems," National Science Foundation, 2/15/10-2/15/11. $13,000.

Internal Research Awards

M.B. Colton, "Haptic Control of a Quadrotor UAV," Ira A. Fulton College of Engineering and Technology Research Initiation Grant, 10/1/07 - 9/30/08. $9,000.

M.B. Colton, "Design and Control of a Planar Haptic Interface," Ira A. Fulton College of Engineering and Technology Research Initiation Grant, 1/1/07 - 12/31/07. $13,000.

M.B. Colton, "Design of a Robot for Therapist-in-the-Loop Assistive Robotics for Children with Autism," Ira A. Fulton College of Engineering and Technology Research Initiation Grant, 1/1/09 - 12/31/09. $12,000.

M.A. Goodrich, M.B. Colton, and M. Spackman, "Therapist-in-the-Loop Assistive Robotics," BYU Mentoring Environment Grant (MEG), 8/08 - 9/09. $18,840.

S.L Thomson, M.B. Colton, and C.A. Mattson, "Analysis of Optimized Flapping Wing Aerodynamics for Micro Air Vehicles," Ira A. Fulton College of Engineering and Technology Research Initiation Grant, 1/1/08 - 12/31/08. $12,000.

C. Taylor, M.B. Colton, and S. Shumway, "Using LEGO Robotics to Encourage Middle and High School Students to Pursue STEM in Higher Education," Ira A. Fulton College of Engineering and Technology Research Initiation Grant, 1/1/08 - 12/31/08. $12,000.

S.L Thomson, M.B. Colton, and C.A. Mattson, "Analysis of Optimized Flapping Wing Aerodynamics for Micro Air Vehicles," Ira A. Fulton College of Engineering and Technology Research Initiation Grant, 1/1/09 - 12/31/09. $3,000.

M.B. Colton and M.D. Killpack, "Navigation for the Blind: 3D Sensing and Obstacle Estimation," Ira A. Fulton College of Engineering and Technology Research Initiation Grant, 1/15-12/15. $10,000.

M.B. Colton, "Inspiring Learning through Ancient Mechanical Engineering Case Studies," David O. McKay Grant, 2018. $21,440.

M.B. Colton, "Modern Analysis of Ancient Mechanical Engineering Examples: Case Studies for Students and Educators," Kennedy Center Faculty Research Grant, 2018. $5,000.

M.B. Colton and S.L. Thomson, "3D Printing Super-Soft Functionally Graded Components," BYU Graduate Mentoring Assistantship, 1/1/18-8/30/19, $13,000.

Professional Activities

Professional Societies

Member, Institute of Electrical and Electronics Engineers (IEEE)
Member, American Society of Mechanical Engineers (ASME)
Member, American Society for Engineering Education (ASEE)
Past Chair, Rocky Mountain Section of ASEE, 2019-2021
Chair, Rocky Mountain Section of ASEE, 2018-2019
Vice Chair, Rocky Mountain Section of ASEE, 2016-2018
BYU Campus Representative, ASEE, 2018-Present
Member, Society for the History of Technology (SHOT)

Conference Activities

Session Chair, ASEE Annual Conference, 2023
Conference Chair, ASEE Rocky Mountain Section Conference, 2017
Program Committee, IEEE Haptics Symposium, 2010-2018
Organizing Committee, IEEE Haptics Symposium, 2016
Organizing Committee, IEEE Haptics Symposium, 2014
Organizing Committee, IEEE Haptics Symposium, 2012
Organizing Committee, IEEE Haptics Symposium, 2010
Awards Committee, IEEE Haptics Symposium, 2010
Session Chair, IEEE Haptics Symposium, 2010, 2012, 2014
Organizer, Session on Co-Robotics and Tele-Presence, IEEE Int. Symp. on Resilient Control Systems, 2012
Organizing Committee, IEEE WorldHaptics Conference, 2009

Journal Reviews

ASME Journal of Mechanical Design, 2012, 2018
IEEE Robotics and Automation Letters, 2017
IEEE Robotics and Automation Magazine, 2012
IEEE Transactions on Haptics, 2008, 2009, 2010, 2014, 2015
IEEE Transactions on Robotics, 2010, 2011
IEEE Transactions on Systems, Man, and Cybernetics, 2010, 2013, 2015, 2016
Mechatronics, 2017
Robotica, 2016
International Journal of Child-Computer Interaction, 2016
International Journal of Human-Computer Studies, 2014
Journal of Human-Robot Interaction, 2014
Human-Computer Interaction, 2012
International Journal of Robotics Research, 2011
Advanced Robotics, 2005
Engineering with Computers, 2009

Conference Reviews

IEEE International Conference on Robotics and Automation (ICRA), 2009, 2010, 2011, 2012, 2013, 2014, 2015
IEEE Haptics Symposium, 2008, 2012, 2014, 2016
IEEE International Conference on Biomedical Robotics and Biomechatronics (BioRob), 2012
IEEE WorldHaptics, 2005, 2007, 2009, 2011, 2013, 2015
ACM/IEEE International Conference on Human-Robot Interaction (HRI), 2010, 2011, 2012, 2013, 2017

ACM SIGCHI Conference on Human Factors in Computing Systems (CHI), 2013
IEEE International Symposium on Robot and Human Interactive Communication (Ro-Man), 2010, 2013, 2014, 2016
International Conference on Applied Bionics and Biomechanics (ICABB), 2010
IEEE Conference on Human System Interaction, 2009
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2007, 2012, 2015, 2017
IEEE International Symposium on Resilient Control Systems (ISRCS), 2012
ASME Dynamic Systems and Control Conference, 2008
ASME Biennial Mechanisms and Robotics Conference, 2004
ASME International Design Engineering Technical Conference (IDETC), 2015
International Conference on Social Robots (ICSR), 2011
ASEE Rocky Mountain Section Conference, 2016
ASEE Annual Conference and Exposition, 2016, 2017, 2019

Other

Review panelist, NSF "Emerging Frontiers in Research and Innovation" (EFRI) program on mind, machines, and motor control (M3C), NSF 10-596, May 16-17, 2011
Review panelist, NSF Graduate Research Fellowship Program (GRF), 2014-2015, 2016-2017
Reviewer of *Feedback Control of Dynamic Systems*, Franklin, Powell, and Emami-Naeini, 2008
Reviewer of *Dynamic Systems: Modeling, Simulation, and Control*, Craig A. Kluever, 2012, 2014
External reviewer of control system curriculum, University of Pretoria, South Africa, 2009

University Service

Brigham Young University

Department Assessment Coordinator, 2022 – Present
Department Undergraduate Coordinator/Chair of Department Undergraduate Committee, 2016 – 2022
Member of Department Computing and Statistics Curriculum Development Committee, 2022
Reviewer of "Inspiring Learning Award" nominations, BYU Experiential Learning and Internships, 2022
Member of College Teaching and Learning Committee, 2015 – 2018
Chair of Department Faculty Search Committee, 2012 – 2015
Chair of Department Dynamic Systems and Mechatronics Curriculum Development Committee, 2013 – 2015
Advisor, BYU Mechatronics Club, 2014 – Present
Advisor, BYU FIRST Robotics Alumni Association, 2017 – 2020
Advisor, BYU LEGO Club, 2019 – 2020
Advisor, BYU Autonomous Ground Vehicle (AGV) Team, 2019 – 2021
Advisor, BYU Spacecraft Club (Attitude Control Group), 2019 – 2020
Member of Department Undergraduate Committee, 2007 – 2012
Member of PhD Dynamics Qualifying Examination Committee, 2008 – Present
Member of Dynamic Systems Lab Upgrade Committee, 2007 –2009
Reviewer of Undergraduate Research Award Proposals, 2008, 2012, 2014, 2015
Advisor, BYU Mars Rover Team, 2022 – 2023
Co-Advisor, BYU Mars Rover Team, 2008
Judge for BYU Prosthetic Leg Design Competition, 2009
Judge for BYU ASME Student Presentation Competition, 2009
Judge for BYU Nephi's Bow Competition, 2012
Judge for Emerging Ideas in Biomedical Research Conference, 2013
Judge for BYU Softball Field Design Competition, 2019
Session Chair, NASA Student Symposium, 2019

University of Utah

Member of University Teaching Committee, 2001-2003
Chair of Design & Controls Division of Mechanical Eng. Graduate Student Advisory Committee, 1997-1998

Community Service

Invited Judge for the Utah Regional FIRST Robotics Competition, 2010-2018
Mentor for FIRST LEGO League (FLL) Team "Version 2.0," 2012 – 2013
Invited Judge for the Central Utah Science and Engineering Fair, 2008
Invited Judge for the Salt Lake Valley Regional Science and Engineering Fair, 2003, 2004
LEGO Outreach Program, Provo High School, 2009
Frequent tours and lectures for schools and youth groups

Student Advisement

Graduate Students Advised

Brandt, Adam, "Haptic collision avoidance for a remotely operated quadrotor UAV in indoor environments," M.S. Thesis, Brigham Young University, 2009
Carlson, Daniel, "Aerial recovery of micro air vehicles: orbit estimation and tracking," M.S. Thesis, Brigham Young University, 2010
Harris, Wesley, "Optimal Design of a Planar 3-RPR Haptic Interface Based on Manipulability," M.S., Brigham Young University, 2010
Ricks, Daniel, "Design and evaluation of a humanoid robot for autism therapy," M.S. Thesis, Brigham Young University, 2010
Leishman, Levi, "Toward the design of a statically balanced fully compliant joint for use in haptic interfaces," M.S. Thesis, Brigham Young University, 2011
Owen, Mark, "Aerial Rendezvous between an Unmanned Air Vehicle and an Orbiting Target Vehicle," M.S. Thesis, Brigham Young University, 2011
Philbrick, Robert, "Effects of Haptic and 3D Audio Feedback on Operator Performance and Workload for Quadrotor UAVs in Indoor Environments," M.S. Thesis, Brigham Young University, 2012
Plooster, Michael, "Vibrotactile Feedback Generation using Envelope Waveforms and Eccentric-mass Motors," M.S. Thesis, Brigham Young University, 2012
Wilcox, Michael, "Trajectory Generation and Optimization for Experimental Investigation of Flapping Flight," M.S. Thesis, Brigham Young University, 2013
Norton, Brandon, "Articulated Spine for a Robot to Assist Children with Autism," M.S. Thesis, Brigham Young University, 2014
Hawks, Jeffrey, "A Variable-Stiffness Compliant Mechanism for Stiffness-Controlled Haptic Interfaces," M.S. Thesis, Brigham Young University, 2014
Robinson, Jacob, "A Compliant Mechanism-Based Variable-Stiffness Joint," M.S. Thesis, Brigham Young University, 2015
Swiss, Dallin, "Springback Force Considerations in Compliant Haptic Interfaces," M.S. Thesis, Brigham Young University, 2015.
McDonald, Samuel, "Haptic Shape-based Management of Robot Teams in Cordon and Patrol," M.S. Thesis, Brigham Young University, 2016
Taylor, Justin, "An Obstacle Avoidance System for the Visually Impaired Using 3-D Point Cloud Processing," M.S. Thesis, Brigham Young University, 2017.
Greenwood, Taylor, "Silicone 3D Printing Processes for Fabricating Synthetic, Self-Oscillating Vocal Fold Models," M.S. Thesis, Brigham Young University, 2020.

Graduate Student Committees

Have served on or currently serve on thesis committees for 84 students (64 MS, 20 PhD) from 4 departments

Undergraduate Students Advised - Recipients of Office of Research and Creative Activities (ORCA) Research Awards
Have advised 76 undergraduate researchers, including 18 recipients of ORCA research awards

Honors and Awards

Karl G. Maeser Professional Faculty Excellence Award, Brigham Young University, 2023
Excellence in Education Award, Ira A. Fulton College of Engineering, 2019
Outstanding Mechanical Engineering Faculty Teaching Award, Ira A. Fulton College of Engineering, 2017
First Place, National ASME Fluids Engineering Division Young Engineer Paper Contest, 1996
Teaching Assistant of the Year, University of Utah, College of Engineering, 2001
Teaching Assistant of the Year, University of Utah, Dept. of Mechanical Engineering, 2001
Teaching Assistant of the Year, University of Utah, Dept. of Mechanical Engineering, 1997

Scholarships and Fellowships

NSF Human/Computer Interface and Intelligent Control Traineeship, 1999
Honors at Entrance Full Tuition Scholarship, University of Utah, 1993 – 1997
Boeing Scholarship, University of Utah, 1996
Dimond Scholarship, University of Utah, 1996
Beam Scholarship, University of Utah, 1995
Ariel Berrier Scholarship, University of Utah, 1995

Consulting Experience

Workman Nydegger, 2001 – 2015, 2022
Alveus Engineering, 2004
Sii MegaDiamond, 2000
NuSkin, 2016 – 2017