

James R. Hermus

CONTACT INFORMATION	77 Massachusetts Ave., Room 3-143 Cambridge, MA 02139	Cell: (608) 444-2779 E-mail: jhermus@mit.edu
RESEARCH INTERESTS	Human physical interaction, robotic control, and neuroscience.	
EDUCATION	Massachusetts Institute of Technology , Cambridge, Massachusetts Ph.D., Mechanical Engineering • <i>Fellowship in Graduate Coaching</i> • <i>Kaufman Teaching Certificate Program</i> • Course work: Controls, dynamics, system ID, machine learning, robotic manipulation Massachusetts Institute of Technology , Cambridge, Massachusetts S.M., Mechanical Engineering University of Wisconsin-Madison , Madison, Wisconsin B.S., Biomedical Engineering • <i>Honors in Research Degree Program</i> • <i>Biology in Engineering Certificate</i>	September 2022 June 2018 May 2016
RESEARCH EXPERIENCE	Graduate Research Assistant The Eric P. and Evelyn E. Newman Laboratory for Biomechanics and Human Rehabilitation Massachusetts Institute of Technology Lab Director: Neville Hogan, Ph.D. Research Topics: Motor Neuroscience, Physical Interaction, Kinematically Redundant Robotics Undergraduate Research Assistant Neuromuscular Biomechanics Lab, University of Wisconsin-Madison Lab Director: Darryl Thelen, Ph.D. Research Topics: Biomechanics, Tendon Stress Estimation, Mechanical Design, MRI Imaging Undergraduate Research Assistant Department of Medical Physics, University of Wisconsin-Madison Lab Director: Charles Mistretta, Ph.D. Research Topics: Computed Tomography, Digital Subtraction Angiography, Beam Attenuators	October 2016 - September 2022 May 2015-August 2016 May 2013-May 2015
TEACHING EXPERIENCE	Lecturer (50% time) Course 2.151: Advances System Dynamics and Control Massachusetts Institute of Technology	September 2022 - Present
TECHNICAL SKILLS	Programming: Matlab, Python, LabVIEW, Java, Arduino, C++, UNIX shell scripting Applications: DRAKE, GitHub, Solidworks, ROS, SPSS, Geomagic, Mimics, Meshlab, L ^A T _E X, Adobe Illustrator, ImageJ, Kurzweil, Microsoft Office Mechanical: 3D printing (Stratasys - Dimensional Elite, Zortrax - M200, MarkForged, Sindoh - 3DWOX DP200), lathe, mill, MIG/TIG/SMAW/gas welder, laser cutter, CNC router, drill press, table saw, band saw	
AWARDS	Massachusetts Institute of Technology de Florez Graduate Science Competition - 2nd Place SNAME Travel Award in Ocean Engineering by MIT MechE Mechanical Engineering Research Exhibition - 1st Place Mechanical Engineering Research Exhibition - Honorable Mention Mechanical Engineering Research Exhibition - Runner up Harrington Fellowship 2.120 - Introduction to robotics competition Most valuable engineering Best Navigation	 2022 2022 2021 2019 2018 2016 2016

Collier Adventure Grant	2018
University of Wisconsin-Madison	
Steuber Prize for Excellence in First-Year Writing	2013
Hilldale Undergraduate/Faculty Research Fellowship	2014
University Book Store Academic Excellence Award	2014
Fred W. & Josephine Colbeck Scholarship	2014, 2015
Wisconsin Experience Accessibility Scholarship	2015
Dallas R. Lamont Scholarship	2013, 2014, 2015
Dean's List	2012-15
Boy Scouts Of America - Eagle Scout	2010

INTELLECTUAL PROPERTY	Meghan Huber, James Hermus , Gabrielle Enns, and Neville Hogan (2021). Variable Compression Body Anchor. Patent Cooperation Treaty Application PCT/US2021/016802. Filed February 5, 2021. Patent Pending.
	Meghan Huber, James Hermus , Gabrielle Enns, and Neville Hogan (2020). Variable Compression Body Anchor. US Patent Application 16/789,638. Filed February 13, 2020. Patent Pending.
PEER REVIEWED PUBLICATIONS	A. Michael West Jr., James Hermus , Meghan Huber, Pauline Maurice, Dagmar Sternad, and Neville Hogan. Dynamic Primitives Limit Human Force Regulation during Motion. <i>IEEE Robotics and Automation Letters</i> 7(2) 2022 [Link]
	James Hermus , Johannes Lachner, David Verdi, and Neville Hogan. Exploiting Redundancy to Facilitate Physical Interaction. <i>IEEE Transactions on Robotics</i> 2021 [Link]
	James Hermus , Joeseeph Doeringer, Dagmar Sternad, and Neville Hogan. Separating Neural Influences from Peripheral Mechanics: The Speed-Curvature Relation in Mechanically-Constrained Actions. <i>Journal of Neurophysiology</i> 123(5) 2020 [Link]
	Jack A. Martin, Scott C.E. Brandon, Emily M. Keuler, James R. Hermus , Alexander C. Ehlers, Daniel J. Segalman, Matthew S. Allen, and Darryl G. Thelen. Gauging Force by Tapping Tendons. <i>Nature Communications</i> 9(1) 2018 [Link]
	James Hermus and Timothy P. Szczykutowicz. 2D-Dynamic Fluid Bowtie Attenuators. <i>Journal of Medical Imaging (JMI)</i> 3(1) 2016 [Link]
	Timothy P. Szczykutowicz, James Hermus , Mark Geurts, and Jeniffer Smilowitz. Realization of fluence field modulated CT on a clinical TomoTherapy megavoltage CT system. <i>Physics in Medicine and Biology</i> 60(18) 2015 [Link]
	Timothy P. Szczykutowicz and James Hermus . Creation of an atlas of filter positions for fluence field modulated CT. <i>Medical Physics</i> 42(4) 2015 [Link]

CONFERENCE
PUBLICATIONS

James Hermus, Dagmar Sternad, Neville Hogan. (2020, November). Evidence for Dynamic Primitives in a Constrained Motion Task. *8th IEEE International Conference on Biomedical Robotics and Biomechatronics (BioRob)*, New York, NY. [\[Link\]](#)

Timothy P. Szczykutowicz, **James Hermus**, Mark Geurts, and Jeniffer Smilowitz. (2015, June). Intensity Modulated Imaging?: Clinical Workflow for Fluence Field Modulated CT On a TomoTherapy System. Presented at the *2015 Annual Medical Physics meeting of the American association of physicists in medicine Summer Meeting*. TH-EF-BRB-6 [\[Link\]](#)

Timothy P. Szczykutowicz and **James Hermus**. (2015, March). Fluence field modulated CT on a clinical TomoTherapy Radiation Therapy Machine. Oral presentation at the *2015 Annual SPIE Medical Imaging Conference*, Proc. 9412, Orlando, FL. [\[Link\]](#)

James Hermus, Charles A. Mistretta and Timothy P. Szczykutowicz. (2015, March). Scatter correction of vessel dropout behind highly attenuating structures in 4D-DSA. Poster presentation at the *2015 Annual SPIE Medical Imaging Conference*, Proc. 9412, Orlando, FL. [\[Link\]](#)

Timothy P. Szczykutowicz and **James Hermus**. Fluid dynamic bowtie attenuators. (2015, March). Oral presentation (**I presented the talk**) at the *2015 Annual SPIE Medical Imaging Conference*, Proc. 9412-31, Orlando, FL. [\[Link\]](#)

James Hermus, Cameron Hays, Michal Adamski, Hannah Lider, Jenny Westlund, Austin Scholp, John Webster and Bjoern Buehring. (2015, May). Posture Monitor for Vibration Exercise Training. Oral presentation at the *2015 IEEE Great Lakes Biomedical Conference*, Milwaukee, WI. [\[Link\]](#)

James Hermus, Timothy P. Szczykutowicz, Brian Davis, Erick L. Oberstar, Martin Wagner, Charles M. Strother, and Charles Mistretta. (2014, March). Quantitative analysis of artifacts in 4D DSA: the relative contributions of beam hardening and scatter to vessel dropout behind highly attenuating structures. Poster presented at *the 2014 Annual SPIE Medical Imaging Conference*, Proc. 9033, San Diego, CA. [\[Link\]](#)

CONFERENCE PRESENTATIONS	James Hermus , Johannes Lachner, David Verdi, and Neville Hogan. (2022, May) Exploiting Redundancy to Facilitate Physical Interaction. Talk and poster at the 2022 <i>IEEE International Conference for Robotics and Automation</i>	
	Michael West, Meghan Huber, James Hermus , Pauline Maurice, Dagmar Sternad, and Neville Hogan. (2021, April). Humans Do Not Directly Control Force During Motion. Poster at the 2021 <i>Annual Conference of the Society for the Neural Control of Movement</i> , Online.	
	James Hermus , Dagmar Sternad, and Neville Hogan. (2020, October). Features of Free Motion Persist in Constrained Actions. Poster at the 2021 <i>IEEE International Conference on Intelligent Robots and Systems, Workshop on Learning Impedance Modulation for Physical Interaction</i> , Online.	
	Laura Schwendeman, James Hermus , Neville Hogan. (2020, October). A Frame-Based Approach to Submovement Decomposition. Interactive talk at the 2020 <i>Neruomatch Conference</i> , Online. [Link]	
	James Hermus , Dagmar Sternad, Neville Hogan. (2019, October). Dynamic primitives account for human constrained motion. Poster presented at the 2019 <i>Annual Conference of the Society for Neuroscience</i> , Chicago, IL.	
	James Hermus , Dagmar Sternad, Neville Hogan. (2019, May). Features of Free Motion Persist in Constrained Actions. Poster presented at the 2019 <i>Annual IEEE International Conference on Robotics and Automation: Human movement science for physical human-robot collaboration workshop</i> , Montreal, Canada.	
	James Hermus , Joseph Doeringer, Dagmar Sternad, Neville Hogan. (2018, July). Physical interaction with a circular constraint. Oral presentation presented at the 2018 <i>Annual International Society of Electrophysiology and Kinesiology</i> . Session Motor Control II, Dublin, Ireland.	
	Jack A. Martin, Emily M. Keuler, James R Hermus , Scott C.E. Brandon, Matthew S. Allen and Darryl G. Thelen. (2017, August). Achilles tendon wave speed tracks joint torque and muscle activity in gait. Received Best Oral Presentation Award at the 2017 <i>Annual American Society for Biomechanics Conference</i> , Boulder, CO.	
	Jack A. Martin, Alexander C. Ehlers, James R. Hermus , Matthew S. Allen, Daniel J. Segalman and Darryl G. Thelen. (2017, February). Dynamic imaging of tendon tissue stress. Received 3rd place award for the conference paper. Oral presentation at the 2017 <i>Bi-annual Summer Biomechanics, Bioengineering and Biotransport Conference</i> , Tucson, AZ.	
	Jack A. Martin, Emily M. Keuler, James R. Hermus , Mikel R. Stiffler, Matthew S. Allen, and Darryl G. Thelen. (2016, August). Ultrasonic Imaging of In Vivo Achilles Tendon Stress During Walking. Presented at the 2016 <i>Annual American Society for Biomechanics Conference</i> , Raleigh, NC.	
SERVICE	Graduate Coach Fellow, MIT	2020-2022
	<ul style="list-style-type: none"> • Trained as peer- and group-coach facilitator to lead discussions • Program based on International Coaching Federation standards and met weekly • Lead group coaching sessions to empower the professional/personal development of grad students • Learned and practiced valuable team leadership/mentoring skills through a Coach Approach 	
	Makerworkshop, MIT	2017-Present
	<ul style="list-style-type: none"> • 3D printing Machine Master • Maintained Markforged, Stratasys, and Zortrax 3d printers for student use. • Trained students on 3D printing and consulted on research and personal design projects. 	
	MIT Outing Club, MIT	2017-Present
SUPERVISION EXPERIENCE	<ul style="list-style-type: none"> • Treasurer, climbing leader, winter school leader • Lead climbing trips, thought technical rope skills, shared a love for the outdoors. • Managed club financials for the club (over \$100k). 	
	Undergraduate Mentees	

Jason Salmon **June 2021 - Present**
Department of Mechanical Engineering, MIT

Laura Schwendeman **December 2019 - May 2021**
Department of Mechanical Engineering, MIT

- Presented an interactive talk at Neuromatch 2020
- John C. and Elizabeth J. Chato Award for Excellence in Bioengineering

Christina Patterson **December 2019 - February 2020**
Department of Mechanical Engineering, MIT

Gabrielle Enns **January 2019 - January 2020**
Department of Mechanical Engineering, MIT

- Prince Innovation Award 2020 – awarded to an undergraduate with a patent/pending patent
- Prince Innovation Award 2021

Haley Higginbotham **August 2018 - May 2019**
Department of Biological Engineering, MIT

Zelin Gong **August 2019 - December 2019**
Department of Computer Engineering, Southern University of Science and Technology

Michael West **May 2017 - August 2017**
Department of Mechanical Engineering, Yale University

- A highlight of the MIT Summer Research Program (MSRP) [\[Video Link\]](#)
- He is now graduate student in MechE at MIT and a member of the Newman Lab.
- This work was recently published in IEEE RA-L

High School Mentees
Will Carter

July 2019

IN THE PRESS “McBurney Disability Resource Center.” Forward Motion. Big Ten Network. June 12th, 2015
Television. [\[Link\]](#)

“Medical Meets Mechanical.” MechEConnects. Winter 2018, Department Newsletter. [\[Link\]](#)