

James R. Hermus

CONTACT INFORMATION	Idiap Research Institute Centre du Parc, Rue Marconi 19, 1920 Martigny, Switzerland	Cell: +41 78 233 54 79 E-mail: jameshermus@gmail.com Website: jameshermus.github.io
RESEARCH INTERESTS	Robotic Manipulation, Physical Interaction, Human Motor Control, Learning from Demonstration, and System Identification.	
EDUCATION	<p>Massachusetts Institute of Technology, Cambridge, Massachusetts</p> <p>Ph.D., Mechanical Engineering</p> <ul style="list-style-type: none"> • <i>Thesis:</i> “A Dynamic Primitives Hypothesis: A Descriptive Model of Human Physical Interaction”, <i>Defense:</i> 9/9/22, <i>Committee:</i> Neville Hogan, Alberto Rodriguez, Harry Asada • <i>Fellowship in Graduate Coaching, Kaufman Teaching Certificate</i> • Course work: Controls, Dynamics, System ID, Machine Learning, Robotic Manipulation <p>Massachusetts Institute of Technology, Cambridge, Massachusetts</p> <p>S.M., Mechanical Engineering</p> <p>University of Wisconsin-Madison, Madison, Wisconsin</p> <p>B.S., Biomedical Engineering</p> <ul style="list-style-type: none"> • <i>Honors in Research, Biology in Engineering Certificate</i> 	September 2022 June 2018 May 2016
AWARDS	<p>Swiss National Science Foundation</p> <p>Ambizione Grant (879k CHF or 1.1m USD)</p> <p>Institute of Electrical and Electronics Engineers (IEEE)</p> <p>Travel grant for IROS to Workshop - Member Support Program (700 USD)</p> <p>Massachusetts Institute of Technology</p> <p>Harrington Fellowship (35k USD)</p> <p>de Florez Graduate Science Competition - 2nd Place (250 USD)</p> <p>SNAME Travel Award in Ocean Engineering by MIT MechE (500 USD)</p> <p>Mechanical Engineering Research Exhibition - 1st Place (500 USD)</p> <p>Mechanical Engineering Research Exhibition - Honorable Mention (100 USD)</p> <p>Mechanical Engineering Research Exhibition - Runner up (300 USD)</p> <p>Assistive Technology Hackathon - 1nd Place Technical Design</p> <p>Collier Adventure Grant (350 USD)</p> <p>University of Wisconsin-Madison</p> <p>Hilldale Undergraduate/Faculty Research Fellowship (4k USD)</p> <p>Dallas R. Lamont Scholarship (2k USD)</p> <p>Fred W. & Josephine Colbeck Scholarship (2k USD)</p> <p>Wisconsin Experience Accessibility Scholarship (800 USD)</p> <p>University Book Store Academic Excellence Award (1k USD)</p> <p>Steuber Prize for Excellence in First-Year Writing (500 USD)</p> <p>Dean's List</p> <p>Boy Scouts Of America - Eagle Scout</p>	2025 2023 2016 2022 2022 2021 2019 2018 2017 2018 2014 2013, 2014, 2015 2014, 2015 2015 2014 2013 2012-15 2010
RESEARCH EXPERIENCE	<p>Postdoctoral Researcher</p> <p>Robot Learning & Interaction Group</p> <p>Idiap Research Institute</p> <p>Lab Director: Sylvain Calinon PhD</p> <p>Postdoctoral Researcher</p> <p>The Learning Algorithms and Systems (LASA) Laboratory</p> <p>École Polytechnique Fédérale de Lausanne (EPFL)</p> <p>Lab Director: Professor Aude Billard</p>	October 2024 - Present February 2023 - May 2024

Postdoctoral Researcher **September 2022 - January 2023**
Graduate Research Assistant **October 2016 - September 2022**
The Eric P. and Evelyn E. Newman Laboratory for Biomechanics and Human Rehabilitation
Massachusetts Institute of Technology
Lab Director: Professor Neville Hogan

Undergraduate Research Assistant **May 2015 - August 2016**
Neuromuscular Biomechanics Lab, University of Wisconsin-Madison
Lab Director: Professor Darryl Thelen

Undergraduate Research Assistant **May 2013-May 2015**
Department of Medical Physics, University of Wisconsin-Madison
Lab Director: Professor Charles Mistretta and Professor Timothy P. Szczykutowicz

TEACHING EXPERIENCE **Lecturer (50% time)** **Fall Term 2022**
Course 2.151: Advances System Dynamics and Control
Rating: 6.5/7
Massachusetts Institute of Technology

Kaufman Teaching Certificate Program **Fall Term 2022**
During the completion of the KTCP course offered by the Teaching + Learning Lab at MIT, we covered several important topics including course design, teaching for belonging, outlining a unit of a course, engaging students and facilitating learning, planning for learning, microteaching, feedback and learning, and syllabus construction.

INTELLECTUAL PROPERTY Meghan Huber, **James Hermus**, Gabrielle Enns, and Neville Hogan (2020). Variable Compression Body Anchor. Patent Number US 11,690,776 B2. Date of Patent July 4, 2023.

PEER REVIEWED PUBLICATIONS **James Hermus**, Michael Bombile, Jari van Steen, Elise Jeandupeux, Ahmed Zermane, Alessandro Melone, Mario Troebinger, Claude Lacoursière, Stijn de Looijer, Sami Haddadin, Abderrahmane Kheddar, Alessandro Saccon, and Aude Billard. Impact-aware dual-arm manipulation. *IEEE Robotics and Automation Magazine* 2025 (Accepted)

Chenguang Zhang, Federico Tessari, **James Hermus**, Himanshu Akolkar, Neville Hogan, Andrew Schwartz. Tuning of Task Relevant Stiffness in Multiple Directions. *Scientific Reports – Nature* **15 (29916)** 2025 [Link]

Harshit Khurana, **James Hermus**, Maxime Gautier, and Aude Billard. Learning the Inverse Hitting Problem. *IEEE Robotics and Automation Letters (RA-L)* **10(5)** 2025 [Link]

Federico Tessari, **James Hermus**, Rika Sugimoto-Dimitrova, and Neville Hogan. Brownian Processes in Human Motor Control Support Descending Neural Velocity Commands. *Scientific Reports – Nature* **14(8341)** 2024 [Link]

James Hermus, Joseph Doeringer, Dagmar Sternad, and Neville Hogan. Dynamic Primitives in Constrained Action: Systematic Changes in the Zero-Force Trajectory. *Journal of Neurophysiology* **131(1)** 2024 [Link]

A. Michael West Jr., **James Hermus**, Meghan Huber, Pauline Maurice, Dagmar Sternad, and Neville Hogan. Dynamic Primitives Limit Human Force Regulation during Motion. *IEEE Robotics and Automation Letters* **7(2)** 2022 [Link]

James Hermus, Johannes Lachner, David Verdi, and Neville Hogan. Exploiting Redundancy to Facilitate Physical Interaction. *IEEE Transactions on Robotics* **38(1)** 2021 [Link]

James Hermus, Joseph Doeringer, Dagmar Sternad, and Neville Hogan. Separating Neural Influences from Peripheral Mechanics: The Speed-Curvature Relation in Mechanically-Constrained Actions. *Journal of Neurophysiology* **123(5)** 2020 [Link]

- PEER REVIEWED PUBLICATIONS (CONTINUED)** 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. *Nature Communications* **9**(1) 2018 [[Link](#)]
- James Hermus** and Timothy P. Szczykutowicz. 2D-Dynamic Fluid Bowtie Attenuators. *Journal of Medical Imaging (JMI)* **3**(1) 2016 [[Link](#)]
- Timothy P. Szczykutowicz, **James Hermus**, Mark Geurts, and Jenifer Smilowitz. Realization of Fluence Field Modulated CT on a Clinical TomoTherapy Megavoltage CT System. *Physics in Medicine and Biology* **60**(18) 2015 [[Link](#)]
- Timothy P. Szczykutowicz and **James Hermus**. Creation of an Atlas of Filter Positions for Fluence Field Modulated CT. *Medical Physics* **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 Jenifer 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** Harshit Khurana, **James Hermus**, Aude Billard. (2024, September). Impact Aware Extended Kalman Filter. Extended Abstract presented at the *2024 40th Anniversary of the IEEE Conference on Robotics and Automation (ICRA@40)*, Abstract no. 378, Rotterdam, Netherlands.
- James Hermus**, Michael Bosongo Bombile, Jari J. van Steen, Elise Jeandupeux, Ahmed Zermane, Alessandro Melone, Mario Troebinger, Abdeldjallil Naceri, Claude Lacoursière, Stijn de Looijer, Sami Haddadin, Abderrahmane Kheddar, Alessandro Saccon, Aude Billard. (2024, September). Impact-aware dual-arm manipulation. Video Submission presented at the *2024 40th Anniversary of the IEEE Conference on Robotics and Automation (ICRA@40)*, Abstract no. 212, Rotterdam, Netherlands.

- CONFERENCE Chenguang Zhang, Himanshu Akolkar, Federico Tessari, **James Hermus**, Neville Hogan, Andrew PRESENTATIONS Schwartz. (2024, November). Neural coding of force and stiffness during a multi-directional (CONTINUED) ballistic-release task. Poster presented at the 2024 *Annual Conference of the Society for Neuroscience*, Abstract no. 6187, Illinois, Chicago.
- James Hermus**, Federico Tessari, Rika Sugimoto-Dimitrova, Neville Hogan. (2023, November). Velocity-level Planning in Human Neuro-motor Control: Behavioral Evidence Based on Brownian Processes. Poster presented at the 2023 *Annual Conference of the Society for Neuroscience*, Abstract no. 5698, Washington, D.C.
- Federico Tessari, Chenguang Zhang, Himanshu Akolkar, **James Hermus**, Neville Hogan, Andrew Schwartz. (2023, November). Direction-independent Stiffness Regulation in a Challenging Ballistic Release Tasks Highlights Human Neuro-Motor Performance Limitations. Poster presented at the 2023 *Annual Conference of the Society for Neuroscience*, Abstract no. 5627, Washington, D.C.
- Chenguang Zhang, Himanshu Akolkar, Federico Tessari, **James Hermus**, Neville Hogan, Andrew Schwartz. (2023, November). Direction-independent Impedance in Non-human Primates. Poster presented at the 2023 *Annual Conference of the Society for Neuroscience*, Abstract no. 5711, Washington, D.C.
- Himanshu Akolkar, Chenguang Zhang, Federico Tessari, **James Hermus**, Neville Hogan, Andrew Schwartz. (2023, November). Task-dependent Stiffness is independent of Movement Direction and Muscle Activation. Poster presented at the 2023 *Annual Conference of the Society for Neuroscience*, Abstract no. 5016, Washington, D.C.
- Chenguang Zhang, Himanshu Akolkar, Federico Tessari, **James Hermus**, Neville Hogan, Andrew Schwartz. (2022, December). Arm Impedance in Different Movement Directions. Poster presented at the 2022 *Annual Conference of the Society for Neuroscience*, Abstract no. 473.09, San Diego, CA.
- James Hermus**, Johannes Lachner, David Verdi, and Neville Hogan. (2022, May) Exploiting Redundancy to Facilitate Physical Interaction. Talk and poster at the 2022 *IEEE International Conference for Robotics and Automation*, Philadelphia, PA.
- 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 *Annual Conference of the Society for the Neural Control of Movement*, Online.
- James Hermus**, Dagmar Sternad, and Neville Hogan. (2020, October). Features of Free Motion Persist in Constrained Actions. Poster at the 2021 *IEEE International Conference on Intelligent Robots and Systems, Workshop on Learning Impedance Modulation for Physical Interaction*, Online.
- Laura Schwendeman, **James Hermus**, Neville Hogan. (2020, October). A Frame-Based Approach to Submovement Decomposition. Interactive talk at the 2020 *Neuromatch Conference*, Online. [[Link](#)]
- James Hermus**, Dagmar Sternad, Neville Hogan. (2019, October). Dynamic Primitives Account for Human Constrained Motion. Poster presented at the 2019 *Annual Conference of the Society for Neuroscience*, Chicago, IL.
- James Hermus**, Dagmar Sternad, Neville Hogan. (2019, May). Features of Free Motion Persist in Constrained Actions. Poster presented at the 2019 *Annual IEEE International Conference on Robotics and Automation: Human movement science for physical human-robot collaboration workshop*, Montreal, Canada.
- James Hermus**, Joseph Doeringer, Dagmar Sternad, Neville Hogan. (2018, July). Physical Interaction with a Circular Constraint. Oral presentation presented at the 2018 *Annual International Society of Electrophysiology and Kinesiology*. Session Motor Control II, Dublin, Ireland.

CONFERENCE PRESENTATIONS (CONTINUED)	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 <i>2017 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 <i>2017 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 <i>2016 Annual American Society for Biomechanics Conference</i> , Raleigh, NC.
INVITED TALKS	Confronting the Paradox of Human Motor Control. (2025, June). Invited speaker at the <i>Lorraine Research Laboratory in Computer Science and its Applications (LORIA)</i> in Nancy, France.
	Robotic Manipulation from a Human Motor Control Perspective. (2024, January). Spotlight talk at the <i>IEEE Robotics and Automation Society Robotics Workshop</i> at EPFL, Lausanne, Switzerland.
	Real Time Adaptive Systems for Human-Robot Collaboration. (2023, March). Invited speaker at the Industry 4.0 Workshop at <i>Swiss Robotics Innovation Booster</i> , Bern, Switzerland.
	Quantifying Strengths and Weaknesses of Human Motor Control and Perception. (2022, May). Invited speaker at the <i>Workshop - Intelligent Control Methods and Machine Learning Algorithms for Human-Robot Interaction and Assistive Robotics</i> as part of the <i>2022 IEEE International Conference for Robotics and Automation</i> , Philadelphia, PA.
	Human Physical Interaction with a Circular Constraint. (October, 2019). Invited speaker at the <i>UW-Madison Neuromuscular Biomechanics Lab</i> , Madison, WI.
UNIVERSITY SERVICE	<p>Graduate Coach Fellow, MIT 2020-2022</p> <ul style="list-style-type: none"> Trained as peer/group-coach facilitator to lead discussions Program based on International Coaching Federation standards and met weekly Led group coaching sessions to empower the professional/personal development of graduate students Learned and practiced valuable team leadership/mentoring skills through a Coach Approach <p>Makerworkshop, MIT 2017-2023</p> <ul style="list-style-type: none"> 3D printing Machine Master 2018-2021 Maintained Markforged, Stratasys, and Zortrax 3d printers for student use. Trained students on 3D printing and consulted on research and personal design projects. <p>MIT Outing Club, MIT</p> <ul style="list-style-type: none"> Treasurer - Managed financials (greater than 200k USD) 2021 Climbing leader and winter school leader 2017-2023 Led climbing trips, taught technical rope skills, and shared a love for the outdoors. <p>Advocates for Diverse Abilities (ADA), UW-Madison</p> <ul style="list-style-type: none"> Co-founder and Vice President 2012-2016 Disability Awareness Student Organization Received runner up for the Social Justice Advocacy Bucky Award 2015 Guest Speaker - Rehabilitation Psychology 300 Class 2012-2016 <p>Service Learning Trip – Dominican Republic, UW-Madison 2013</p> <p>Tutoring in Adaptive Technology - Kurzweil and Dragon Speaks, UW-Madison 2014</p>
ROBOTICS COMMUNITY SERVICE	<p>Workshop Organizer</p> <ul style="list-style-type: none"> <i>IEEE Robotics and Automation Society Robotics Workshop at EPFL</i>. Lausanne, Switzerland. January 10, 2024. <i>Multilimb Coordination and Learning: an Interplay of Robotics and Human Neuroscience</i>. IEEE

International Conference on Intelligent Robots and Systems (IROS). Detroit, MI. October 5, 2023. [Link]

Reviewer

- Scientific Reports – Nature
- IEEE Transactions of Robotics (T-RO)
- IEEE Robotics and Automation – Letters
- IEEE International Conference for Robotics and Automation (ICRA)
- IEEE International Conference on Intelligent Robots and Systems (IROS)
- IEEE International Conference on Rehabilitation Robotics (ICORR)
- Robotics: Science and Systems
- Hindawi Applied Bionics and Biomechanics

SUPERVISION EXPERIENCE	Doctoral Mentees Harshit Khurana Department of Microengineering, EPFL Microsoft Research	Feburary 2023 - May 2024
	Yang Liu Department of Microengineering, EPFL	Feburary 2023 - May 2024
	Masters Thesis Mentees Nicolas Arons Department of Mechanical Engineering, MIT	September 2020 - September 2022
	Masters Semester Project Mentees Julien Molland Department of Microengineering, EPFL	Fall Semester 2023
	Nathan Benavides Department of Microengineering, EPFL	Fall Semester 2023
	Adré Schakkal Department of Microengineering, EPFL	Spring Semester 2023
	Undergraduate Mentees Jason Salmon Department of Mechanical Engineering, MIT	June 2021 - June 2022
	Laura Schwendeman Department of Mechanical Engineering, MIT • Presented an interactive talk at Neuromatch 2020 • John C. and Elizabeth J. Chato Award for Excellence in Bioengineering	December 2019 - May 2021
	Christina Patterson Department of Mechanical Engineering, MIT	December 2019 - February 2020
	Gabrielle Enns Department of Mechanical Engineering, MIT • Prince Innovation Award 2020 – awarded to an undergraduate with a patent/pending patent • Prince Innovation Award 2021	January 2019 - January 2020
	Haley Higginbotham Department of Biological Engineering, MIT	August 2018 - May 2019
	Zelin Gong Department of Computer Engineering, Southern University of Science and Technology	August 2019 - December 2019

Michael West Ph.D. **May 2017 - August 2017**

Department of Mechanical Engineering, Yale University

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

High School Mentees

Will Carter

July 2019

IN THE PRESS “Idiap Researcher Awarded SNSF Ambizione Grant to Advance Human Motor Control and Robotics” *Idiap News*. October 17, 2025. [\[Link\]](#)

“Learning challenges shape a mechanical engineer’s path.” *MIT News*. February 12th, 2023. [\[Link\]](#)

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

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

REFERENCES

Prof. Neville Hogan (MIT)

neville@mit.edu

Prof. Meghan Huber (University Massachusetts Amherst)

mehuber@umass.edu

Prof. Dagmar Sternad (Northeastern University)

d.sternad@northeastern.edu

Sylvain Calinon PhD (Idiap Research Institute)

sylvain.calinon@idiap.ch