

Curriculum Vitae

Jesse C. Dean

Locomotion and Energetics Group
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Education / Professional Preparation

University of Delaware	Biological Sciences	B.A.	1996 - 2000
University of Delaware	Physics	B.A.	1996 - 2000
University of Michigan	Biomedical Engineering	M.S.	2000 - 2002
University of Michigan	Biomedical Engineering	Ph.D.	2002 - 2005
University of Alberta	Neuroscience	Postdoctoral fellow	2005 - 2008

Academic Appointments

2014 – present	Associate Professor; Division of Physical Therapy, Department of Health Professions, Medical University of South Carolina (MUSC)
2013 – present	Faculty appointment; Department of Health Sciences and Research, MUSC
2012 – present	Biomedical Engineer; Ralph H. Johnson Veterans Affairs Medical Center; Charleston, SC
2008 – 2014	Assistant Professor; Division of Physical Therapy, Department of Health Professions, MUSC

Personal Statement

My overall research goal is to apply an engineering-based understanding of human movement to the development of effective rehabilitation techniques for clinical populations with limited functional mobility. I am particularly interested in pursuing a mechanism-based understanding of human neuromechanics, with a focus on the influence of body biomechanics and sensory feedback on the control of human locomotion. I have extensive experience using experimental and computational modeling studies to investigate the links between the mechanics, neural control, and energetics of human movement. My current areas of research focus on the development of low-cost devices to provide useful gait assistance, the investigation of control strategies used to maintain human gait stability, and the investigation of how sensory feedback is integrated to achieve typical levels of postural and gait function. Each of these lines of research spans the continuum from basic science research in neurologically intact controls to applied interventional research among individuals who have experienced a neurological injury. By addressing our research questions at multiple levels, we maximize the likelihood of effective clinical translation.

My teaching philosophy centers on the three concepts of knowledge clarity, salience, and continual growth. I believe that a teacher's responsibility is to promote student effort by setting clear goals, presenting material directly relevant to student interests, and challenging students to solve problems rather than simply memorize facts. In didactic courses, I keep students active in the classroom through hands-on demonstrations, near-continuous interaction between the instructor and students, and frequent non-punitive feedback. Outside the classroom, I believe that involving students in my laboratory's research has promoted their learning while also making a contribution to the literature in the field. The excitement associated with discovery can be a valuable tool to drive learning, and I believe that my experience in research improves my effectiveness as a teacher.

Within the larger rehabilitation community, I believe that the combination of my primary faculty appointment in a clinical program and my academic background in engineering positions me to make a unique contribution to the field. Beyond shaping my research agenda around clinical problems revealed by rehabilitation practitioners, I aim to promote hands-on links between students in the fields, with the long-term goal of developing relationships that improve clinical treatment effectiveness.

Publications (* indicates senior author)

1. Reimold NK, Knapp HA, Chesnutt AN, Agne A, **Dean JC***. Effects of targeted assistance and perturbations on the relationship between pelvis motion and step width in people with chronic stroke. *IEEE Trans Neur Sys Rehab Eng*. In Press.
2. Reimold NK, Knapp HA, Henderson RE, Wilson L, Chesnutt AN, **Dean JC***. Altered active control of step width in response to mediolateral leg perturbations while walking. *Sci Reports*. 10: 12197, 2020.
3. Frame NB, Finetto C, **Dean JC**, Neptune RR. The influence of lateral stabilization on walking performance and balance control in neurologically-intact and post-stroke individuals. *Clin Biomech*. 73: 172-180, 2020.
4. **Dean JC**, Bowden MG, Kelly AL, Kautz SA. Altered post-stroke propulsion is related to paretic swing phase kinematics. *Clin Biomech*. 72: 24-30, 2019.
5. Heitkamp LN, Stimpson KH, **Dean JC***. Application of a novel force-field to manipulate the relationship between pelvis motion and step width in human walking. *IEEE Trans Neur Sys Rehab Eng*. 27: 2051-2058, 2019.
6. Stimpson KH, Heitkamp LN, Embry AE, **Dean JC***. Post-stroke deficits in the step-by-step control of paretic step width. *Gait Posture*. 70: 136-140, 2019.
7. Charalambous CC, **Dean JC**, Adkins DL, Hanlon CA, Bowden MG. Characterizing the corticomotor connectivity of the bilateral ankle muscles during rest and isometric contraction in healthy adults. *J Electromyogr Kinesiol*. 41: 9-18, 2018.
8. Sacco CC, Gaffney EM, **Dean JC***. Effects of white noise Achilles tendon vibration on quiet standing and active postural positioning. *J Appl Biomech*. 34: 151-158, 2018.
9. Stimpson KH, Heitkamp LN, Horne JS, **Dean JC***. Effects of walking speed on the step-by-step control of step width. *J Biomech*. 68: 78-83, 2018.
10. Nyberg ET, Broadway J, Finetto C, **Dean JC***. A novel elastic force-field to influence mediolateral foot placement during walking. *IEEE Trans Neur Sys Rehab Eng*. 25: 1481-1488, 2017.
11. McGrattan KE, McFarland DH, **Dean JC**, Hill E, White DR, Martin-Harris B. Effect of single-use, laser-cut, slow-flow nipples on respiration and milk ingestion in preterm infants. *Am J Speech Lang Pathol*. 26: 832-839, 2017.
12. **Dean JC**, Embry AE, Stimpson KH, Perry LA, Kautz SA. Effects of hip abduction and adduction accuracy on post-stroke gait. *Clin Biomech*. 44: 14-20, 2017.
13. Roden-Reynolds DC, Walker MH, Wasserman CR, **Dean JC***. Hip proprioceptive feedback influences the control of mediolateral stability during human walking. *J Neurophysiol*. 114(4): 2220-2229, 2015.
14. **Dean JC**, Kautz SA. Foot placement control and gait instability among people with stroke. *J Rehab Res Dev*. 52(5): 577-590, 2015.
15. Hubbuch JE, Bennett BW, **Dean JC***. Proprioceptive feedback contributes to the adaptation toward an economical gait pattern. *J Biomech*. 48(11): 2925-2931, 2015.
16. Kubinski SN, McQueen CA, Sittloh KA, **Dean JC***. Walking with wider steps increases stance phase gluteus medius activity. *Gait Posture*. 41(1): 130-135, 2015.
17. **Dean JC**, Clair-Auger JM, Lagerquist O, Collins DF. Asynchronous recruitment of low-threshold motor units during repetitive, low-current stimulation of the human tibial nerve. *Front Hum Neurosci*. 8: 1002, 2014.
18. Rankin BL, Buffo SK, **Dean JC***. A neuromechanical strategy for mediolateral foot placement in walking humans. *J Neurophysiol*. 112(2): 374-383, 2014.
19. Wellenbrock MA, Bunchman AM, **Dean JC***. Gradual mechanics-dependent adaptation of medial gastrocnemius activity during human walking. *J Neurophysiol*. 111(5): 1120-1131, 2014.
20. Floyd LM, Holmes TC, **Dean JC***. Reduced effects of tendon vibration with increased task demand during active, cyclical ankle movements. *Exp Brain Res*. 232(1): 283-292, 2014.
21. **Dean JC**. Proprioceptive feedback and preferred patterns of human movement. *Exerc Sport Sci Rev*. 41(1): 36-43, 2013.

22. Monsch ED, Franz CO, **Dean JC***. The effects of gait strategy on metabolic rate and indicators of stability during downhill walking. *J Biomech.* 45(11): 1928-1933, 2012.
23. Merritt KJ, Raburn CE, **Dean JC***. Adaptation of the preferred human bouncing pattern toward the metabolically optimal frequency. *J Neurophysiol.* 107(8): 2244-2249, 2012.
24. Raburn CE, Merritt KJ, **Dean JC***. Preferred movement patterns during a simple bouncing task. *J Exp Biol.* 214(22): 3768-3774, 2011.
25. Bickel CS, Gregory CM, **Dean JC**. Motor unit recruitment during neuromuscular electrical stimulation: A critical appraisal. *Eur J Appl Physiol.* 111(10): 2399-2407, 2011.
26. **Dean JC**, Kuo AD. Energetic costs of producing muscle work and force in a cyclical human bouncing task. *J Appl Physiol.* 110(4): 873-880, 2011.
27. Hunter LC, Hendrix EC, **Dean JC***. The cost of walking downhill: Is the preferred gait energetically optimal? *J Biomech.* 43(10): 1910-1915, 2010.
28. **Dean JC**, Collins DF. Nonlinear twitch torque summation by motor units activated at M-wave and H-reflex latencies. *Muscle Nerve.* 40(2): 221-230, 2009.
29. **Dean JC**, Kuo AD. Elastic coupling of limb joints enables fast bipedal walking. *J Royal Soc Interface.* 6(35): 561-573, 2009.
30. **Dean JC**, Yates LM, Collins DF. Turning off the central contribution to contractions evoked by neuromuscular electrical stimulation. *Muscle Nerve.* 38(2): 978-986, 2008.
31. **Dean JC**, Alexander NB, Kuo AD. The effect of lateral stabilization on walking in young and old adults. *IEEE Trans Biomed Eng.* 54(11): 1919-1926, 2007.
32. **Dean JC**, Yates LM, Collins DF. Turning on the central contribution to contractions evoked by neuromuscular electrical stimulation. *J Appl Physiol.* 103(1): 170-176, 2007.
33. **Dean JC**, Kuo AD, Alexander NB. Age-related changes in maximal hip strength and movement speed. *J Gerontol A Biol Sci Med Sci.* 59(3): 286-292, 2004.
34. Binder-Macleod SA, **Dean JC**, Ding J. Electrical stimulation factors in potentiation of human quadriceps femoris. *Muscle Nerve.* 25(2): 271-279, 2002.
35. Stackhouse SK, **Dean JC**, Lee SC, Binder-Macleod SA. Measurement of central activation failure of the quadriceps femoris in healthy adults. *Muscle Nerve.* 23(11): 1706-1712, 2000.

Selected Conference Presentations (* indicates senior author)

1. Agne AA, Chesnutt AN, **Dean JC***. Predicting post-stroke independent walking from active postural sway. *American Physical Therapy Association Combined Sections Meeting.* Denver, Colorado, USA. February 12-15 2020.
2. Knapp HA, Chesnutt AN, Agne AA, **Dean JC***. Application of real-time hip abductor vibration to influence walking stability. *American Physical Therapy Association Combined Sections Meeting.* Denver, Colorado, USA. February 12-15 2020.
3. **Dean JC**. A role for proprioception in the selection of economical gaits. *International Society of Biomechanics Congress XXVII.* Calgary, Canada. July 31-August 4, 2019.
4. Knapp HA, Hydar AN, **Dean JC***. Comparison of force-field based methods to promote post-stroke gait stabilization. *American Physical Therapy Association Combined Sections Meeting.* Washington D.C., USA. January 23-26, 2019.
5. **Dean JC**. Development of an intervention-focused metric of gait balance. *42nd Annual Meeting of the American Society of Biomechanics.* Rochester, Minnesota, USA. August 8-11, 2018.
6. **Dean JC**, Bowden MG, Kautz SA. Post-stroke stiff knee gait is linked to mis-timed braking forces. *42nd Annual Meeting of the American Society of Biomechanics.* Rochester, Minnesota, USA. August 8-11, 2018.
7. Herrmann AA, **Dean JC***. Effects of ankle tendon vibration on post-stroke ankle proprioception. *42nd Annual Meeting of the American Society of Biomechanics.* Rochester, Minnesota, USA. August 8-11, 2018.

8. **Dean JC**. The problem of gait instability: can a biomechanics-based approach provide unique insight? *Human Movement Variability Conference*. Omaha, Nebraska, USA. May 17, 2018.
9. **Dean JC**, Hydar A, Monsch E, Kautz SA. Integration of stroke recovery research with clinical physical therapy in South Carolina. *South Carolina American Physical Therapy Association Annual Meeting*. Charleston, South Carolina, USA. April 13-14, 2018.
10. Maynard KT, Bowman MM, **Dean JC***. Application of a novel force-field to influence post-stroke gait stabilization strategy. *American Physical Therapy Association Combined Sections Meeting*. New Orleans, Louisiana, USA. February 21-24, 2018.
11. Dutt-Mazumder A, Segal RL, Davis L, Thompson AK, **Dean JC**. Morphological and reflex properties of soleus during ankle flexion. *47th Annual Meeting of the Society for Neuroscience*. Washington DC, USA. November 11-15, 2017.
12. Bowman MM, Maynard KT, **Dean JC***. Application of a novel elastic force-field to influence lateral gait stabilization strategy. *41st Annual Meeting of the American Society of Biomechanics*. Boulder, Colorado, USA. August 8-11, 2017.
13. Frame HB, Finetto C, **Dean JC**, Neptune RR. The influence of lateral stabilization on hemiparetic walking. *41st Annual Meeting of the American Society of Biomechanics*. Boulder, Colorado, USA. August 8-11, 2017.
14. Wilson L, Reimold N, **Dean JC***. Effects of mechanical step width manipulation on dynamic stability. *41st Annual Meeting of the American Society of Biomechanics*. Boulder, Colorado, USA. August 8-11, 2017.
15. Broadway J, Nyberg ET, **Dean JC***. Use of a novel mechanical context to manipulate preferred step width. *American Physical Therapy Association Combined Sections Meeting*. San Antonio, Texas, USA. February 15-18, 2017.
16. Gaffney EM, Sacco CC, **Dean JC***. Effects of proprioceptive enhancement on postural and gait performance. *American Physical Therapy Association Combined Sections Meeting*. San Antonio, Texas, USA. February 15-18, 2017.
17. Charalambous CC, Bowden MG, **Dean JC**. Associations between motor corticospinal excitability and task-specific neuromechanics of the paretic soleus and tibialis anterior. *40th Annual Meeting of the American Society of Biomechanics*. Raleigh, North Carolina, USA. August 2-5, 2016.
18. **Dean JC**. Post-stroke deficits in a mediolateral gait stabilization strategy (and a possible intervention). *XXI International Society of Electrophysiology and Kinesiology Congress*. Chicago, Illinois, USA. July 5-8, 2016.
19. **Dean JC**, Embry AE, Stimpson KH, Kautz SA. The role of hip positioning accuracy in post-stroke gait. *American Physical Therapy Association Combined Sections Meeting*. Anaheim, California, USA. February 17-20, 2016.
20. Broadway J, Nyberg ET, **Dean JC***. Development of an elastic force-field to influence mediolateral foot placement during walking. *39th Annual Meeting of the American Society of Biomechanics*. Columbus, Ohio, USA. August 5-8, 2015.
21. Gaffney EM, Sacco CC, **Dean JC***. Effects of white noise Achilles tendon vibration on standing posture. *39th Annual Meeting of the American Society of Biomechanics*. Columbus, Ohio, USA. August 5-8, 2015.
22. Bennett BW, Hubbuch JE, **Dean JC***. Proprioceptive feedback contributes to adaptation toward an economical gait pattern. *7th World Congress of Biomechanics*. Boston, Massachusetts, USA. July 6-11, 2014.
23. **Dean JC**. Adaptation and metabolic economy. *7th World Congress of Biomechanics*. Boston, Massachusetts, USA. July 6-11, 2014.
24. Herrmann A, **Dean JC***. Changes in task demand influence adaptation of the preferred gait pattern during human walking. *7th World Congress of Biomechanics*. Boston, Massachusetts, USA. July 6-11, 2014.
25. Buffo SK, Rankin BL, **Dean JC***. Active control of foot placement during perturbed gait. *Gait and Clinical Movement Analysis Society Annual Meeting*. Cincinnati, Ohio, USA. May 14-17, 2013.
26. Charalambous CC, **Dean JC***. Optimizing the spring configuration of a passive elastic exoskeleton. *Gait and Clinical Movement Analysis Society Annual Meeting*. Cincinnati, Ohio, USA. May 14-17, 2013.
27. Kubinski SN, McQueen CA, Sittloh KA, **Dean JC***. The effect of step width on gluteus medius activity. *Gait and Clinical Movement Analysis Society Annual Meeting*. Cincinnati, Ohio, USA. May 14-17, 2013.

28. Bunchman AM, Wellinghoff MA, **Dean JC***. Adaptation of plantarflexor muscle activity during gait. *36th Annual Meeting of the American Society of Biomechanics*. Gainesville, Florida, USA. August 15-18, 2012.
29. Charalambous CC, **Dean JC***. Magnitude and time course of adaptation during walking with a passive elastic exoskeleton. *36th Annual Meeting of the American Society of Biomechanics*. Gainesville, Florida, USA. August 15-18, 2012.
30. Holmes TC, Floyd LM, **Dean JC***. Vibration impairs proprioception during active cyclical ankle movements. *36th Annual Meeting of the American Society of Biomechanics*. Gainesville, Florida, USA. August 15-18, 2012.
31. **Dean JC**. A foot placement strategy for the active control of gait stability. *Dynamic Walking Conference*. Pensacola, Florida, USA. May 21-24, 2012.
32. **Dean JC**. Intensive mobility training and functional assessment post-stroke: biomechanics of walking. *South Carolina American Physical Therapy Association Annual Conference*. Greenville, South Carolina, USA. April 13-15, 2012.
33. Charalambous CC, **Dean JC***. Does a passive exoskeleton with two degrees of freedom at the hip make walking easier? *Human Movement Science Research Symposium*. Chapel Hill, North Carolina, USA. February 17, 2012.
34. **Dean JC**. Effects of a passive elastic exoskeleton during walking. *35th Annual Meeting of the American Society of Biomechanics*. Long Beach, California, USA. August 10-13, 2011.
35. Floyd LM, Holmes TC, **Dean JC***. Contributors to ankle proprioception for static and dynamic tasks. *35th Annual Meeting of the American Society of Biomechanics*. Long Beach, California, USA. August 10-13, 2011.
36. Franz CO, Monsch ED, **Dean JC***. Effects of varying gait strategy on metabolic cost and stability. *35th Annual Meeting of the American Society of Biomechanics*. Long Beach, California, USA. August 10-13, 2011.
37. Hendrix EC, Hunter LC, **Dean JC***. Walking downhill: the trade-off between energetics and stability. *34th Annual Meeting of the American Society of Biomechanics*. Providence, Rhode Island, USA. August 18-21, 2010.
38. Merritt KJ, Raburn CE, **Dean JC***. Preferred frequency during a simple bouncing task. *34th Annual Meeting of the American Society of Biomechanics*. Providence, Rhode Island, USA. August 18-21, 2010.
39. **Dean JC**. Optimizing gait rehabilitation: how can nervous system plasticity be harnessed? *South Carolina Bioengineering Alliance*. Charleston, South Carolina, USA. March 23-24, 2010.
40. **Dean JC**. Development of a passive exoskeleton for swing phase gait assistance. *Dynamic Walking Conference*. Vancouver, Canada. June 8-11, 2009.
41. Moreau NG, Kraft S, **Dean JC**. Normal and abnormal gait analysis and its clinical applications. *South Carolina American Physical Therapy Association Annual Conference*. Charleston, South Carolina, USA. April 24-26, 2009.
42. **Dean JC**. The role of biomechanics in improving gait rehabilitation. *South Carolina Bioengineering Symposium*. Columbia, South Carolina, USA. April 14-15, 2009.
43. **Dean JC**, Clair JM, Collins DF. The effect of reciprocal inhibition on the recruitment of human soleus motor neurons by low current electrical stimulation. *Mechanisms of Plasticity and Disease in Motor Neurons*. Seattle, Washington, USA. June 26-29, 2008.
44. **Dean JC**, Clair JM, Lagerquist O, Collins DF. Evidence for persistent inward currents in human motor neurons during low intensity electrical stimulation: Asynchronous motor unit firing. *37th Annual Meeting of the Society for Neuroscience*. San Diego, California, USA. November 3-7, 2007.
45. **Dean JC**, Collins DF. The contribution of sensory feedback to rhythmic human plantarflexion. *Alberta Motor Control Neurohike Meeting*. Jasper, Alberta, Canada. September 20-23, 2007.
46. **Dean JC**, Clair JM, Lagerquist O, Collins DF. Recruitment of human motor units during low current electrical stimulation. *IBRO World Congress of Neuroscience Satellite Meeting, "Motor Control at the Top End"*. Darwin, Australia. July 18-21, 2007.
47. **Dean JC**, Collins DF. Time course of motor unit recruitment during low current tetanic electrical stimulation of the human tibial nerve. *Alberta Motor Control Neuroski Meeting*. Kananaskis, Alberta, Canada. March 23-25, 2007.

48. **Dean JC**, Yates LM, Collins DF. The contributions of M-waves and H-reflexes to torque during electrical stimulation of the tibial nerve in humans. *36th Annual Meeting of the Society for Neuroscience*. Atlanta, Georgia, USA. October 14-18, 2006.
49. **Dean JC**, Collins DF. M-wave and H-reflex contributions to muscle force during electrical stimulation. *Alberta Motor Control Neurohike Meeting*. Kananaskis, Alberta, Canada. September 22-25, 2006.
50. **Dean JC**, Collins DF. Movement frequency and FES powered work. *5th World Congress of Biomechanics*. Munich, Germany. July 29 – August 4, 2006.
51. Collins DF, **Dean JC**, Lagerquist O, Yates LM. Central and peripheral contributions to contractions evoked by tetanic electrical stimulation of human muscle. *5th World Congress of Biomechanics*. Munich, Germany. July 29 – August 4, 2006.
52. **Dean JC**, Kuo AD. Biarticular spring action during walking. *Dynamic Walking Conference*. Ann Arbor, Michigan, USA. May 6-8, 2006.
53. **Dean JC**, Yates LM, Collins DF. The effect of reciprocal inhibition on the central contribution to electrically stimulated muscle force. *Canadian Physiological Society Winter Meeting*. Lake Louise, Alberta, Canada. February 2-5, 2006.
54. **Dean JC**, Kuo AD. A simple passive model that walks like a human. *Alberta Motor Control Neurohike Meeting*. Jasper, Alberta, Canada. September 23-25, 2005.
55. **Dean JC**, Kuo AD. Powering the kneed passive walker with biarticular springs. *XXth Congress of the International Society of Biomechanics and 29th Annual Meeting of the American Society of Biomechanics*. Cleveland, Ohio, USA. July 31 – August 5, 2005.
56. **Dean JC**, Alexander NB, Kuo AD. The effect of aging on lateral stability in walking. *57th Annual Scientific Meeting of the Gerontological Society of America*. Washington, DC, USA. November 19-23, 2004.
57. **Dean JC**, Kuo AD. Minimal actuation requirements for powering the passive walking model with knees. *28th Annual Meeting of the American Society of Biomechanics*. Portland, Oregon, USA. September 8-11, 2004.
58. **Dean JC**, Kuo AD, Alexander NB. Simulating the role of maximum hip flexion strength and movement speed in forward fall prevention. *56th Annual Scientific Meeting of the Gerontological Society of America*. San Diego, California, USA. November 21-25, 2003.
59. **Dean JC**, Kuo AD. Metabolic costs of human bouncing. *27th Annual Meeting of the American Society of Biomechanics*. Toledo, Ohio, USA. September 24-27, 2003.
60. **Dean JC**, Kuo AD, Alexander NB. Age-related changes in maximal hip strength and movement speed. *55th Annual Scientific Meeting of the Gerontological Society of America*. Boston, Massachusetts, USA. November 22-26, 2002.

Current Funded Grants

“Development of Sensory Augmentation Methods to Improve Post-Stroke Gait Stability”.

1 I01 RX003146-01A1; VA/RRD; \$1,045,800

Principal Investigator; 37.5% Effort; August 2019 – July 2023.

The major goal of this project is to develop and test a method of providing real-time augmentation of hip proprioceptive feedback during post-stroke walking.

“A Novel Mechanics-based Intervention to Improve Post-Stroke Gait Stability”.

1 I01 RX002256-01A1; VA/RRD; \$1,028,100

Principal Investigator; 62.5% Effort; January 2017 – December 2021 (NCE).

The major goal of this project is to conduct initial testing of a novel rehabilitation device to improve post-stroke gait stability, based on principles of motor learning.

“Integration of Postural Control Measures to Enhance the Development of Assessments and Interventions for Post-Stroke Functional Mobility”.

Pilot project under grant 1 P20 GM109040-01; PI: Kautz

South Carolina Research Center for Recovery from Stroke COBRE Pilot Project Program; \$80,000

Principal Investigator; 5% Effort; January 2019 – June 2021.

The major goal of this project is to investigate the relationship between post-stroke independent walking and the performance of challenging tasks during standing posture.

Completed Funded Grants

“Mechanism-based Strategies to Restore Post-Stroke Gait Stability through Targeted Motor Adaptation”.

1 R21 HD088869-01A1; NIH/NICHHD; \$406,581

Principal Investigator; 20% Effort; March 2017 – December 2019 (NCE).

The major goal of this project is to test the potential of a novel elastic force-field to cause beneficial gait adaptation among individuals who have experienced a stroke.

“Development of a Novel Rehabilitation Device for the Improvement of Gait Stability”.

#1603391; NSF/GARDE; \$304,896

Principal Investigator; 8% Effort; July 2016 – June 2019.

The major goal of this project is to develop a rehabilitation device that can be used to influence foot placement location during walking, with possible implications for gait stability.

“Influence of Lateral Stabilization on Walking Ability Post-Stroke”.

1 R21 HD083964-01A1; NIH/NICHHD; \$433,945

Co-investigator (MUSC site PI; overall PI = Rick Neptune); 10% Effort; April 2016 – March 2018.

The major goal of this project was to investigate how mediolateral balance control mechanisms are impaired and compensated for post-stroke, to motivate targeted interventions to improve balance control.

“Post-Stroke Contributors to Increased Energetic Cost and Decreased Gait Stability”.

1 IK2 RX000750-01A1; VA/RRD; \$639,100

Principal Investigator; 75% Effort; October 2012 – September 2016.

Primary research mentor: Steve Kautz. Clinical mentor: Robert Adams.

The major goal of this project was to investigate the effects of post-stroke changes in neural control accuracy on energetic cost and gait stability.

“Ultrasound Technology to Enhance Measurement of Post-Stroke Behavior and Function”.

Pilot project under grant 1 P20 GM109040-01; PI: Kautz

South Carolina Research Center for Recovery from Stroke COBRE Pilot Project Program; \$43,336

Principal Investigator; 5% Effort; December 2014 – November 2015.

The major goal of this project was to enhance the research capacity of the Quantitative Behavioral and Rehabilitation Core at MUSC by acquiring the technology and expertise necessary to quantify post-stroke musculotendon mechanics.

“Evidence in Education and Practice; Clinic, Research, Educate, Advocate – translating outcomes responsibly”.

MUSC Department of Health Professions Seed Grant Program; \$5,000

Co-principal investigator; 0% Effort; August 2014 – July 2015.

The major goal of this project was to quantify the effects of a structured research experience on the subsequent use of evidence based practice by students during their clinical rotations.

“Development of a Passive Elastic Exoskeleton for Gait Rehabilitation”.

1 R21 HD064964-01A1; NIH/NICHHD; \$347,000

Principal Investigator; 35% Effort; April 2011 – September 2013.

The major goal of this project was to build and optimize a low-cost mechanical device to make walking easier for neurologically-intact human participants, for potential future use in gait rehabilitation.

Classroom Teaching Experience

Course Name	Program*	Academic Year	Credits	Course Score [#]	Instructor Score [#]
Movement Science	DPT	2020-2021	3	4.90	4.90
		2019-2020	3	4.98	4.94
		2018-2019	3	4.82	4.94
		2017-2018	3	4.77	4.77

		2016-2017	3	4.77	4.79
		2015-2016	3	4.81	4.82
		2014-2015	3	4.78	4.75
		2013-2014	3	4.75	4.75
		2012-2013	3	4.76	4.79
		2011-2012	3	4.79	4.87
		2010-2011	3	4.32	4.07
		2009-2010	3	4.24	4.12
Research Seminar	DPT	2020-2021	1	4.67	4.89
		2019-2020	1	NA	NA
		2018-2019	1	NA	NA
		2017-2018	1	4.72	4.88
		2016-2017	1	NA	NA
		2015-2016	1	4.50	5.00
		2014-2015	1	4.60	4.76
		2013-2014	1	NA	NA
		2012-2013	1	3.93	4.93
		2011-2012	1	4.45	4.80
		2010-2011	2	4.56	4.58
		2009-2010	2	4.19	4.67
		2008-2009	2	NA	NA
Diversity/Inclusion	HRS	2020-2021	1	4.60	4.70
		2018-2019	1	NA	NA
		2016-2017	1	NA	NA
Signal Processing	HRS	2017-2018	2	NA	NA
		2015-2016	1	5.00	NA
		2013-2014	1	4.54	4.74
Ergonomics	HPER	2007-2008	3	NA	NA
		2006-2007	3	NA	NA
		2005-2006	3	NA	NA
Biomechanics	HPER	2007-2008	3	NA	NA

*DPT = Division of Physical Therapy (MUSC); HRS = Health and Rehabilitation Sciences PhD Program (MUSC); HPER = Health, Physical Education, and Recreation (University of Alberta)

#Course and Instructor scores are calculated from student evaluations, and are out of a maximum of 5 points. NA indicates that these scores are not available to the instructor (e.g. due to a small number of student responses, or being housed at another institution).

Development of Teaching Skills

“Innovations in Online Teaching” presentation. MUSC. October 2020.

“What the Best Teachers Do” book club participation. MUSC. February 2017.

“How Learning Works” book club participation. MUSC. September 2015-October 2016.

“Strategies of Innovative Teaching: Planning for Active Learning and the Flipped Classroom” workshop attendance.

MUSC. November 2015.

“Brain Rules” discussion group participation. MUSC. March-October, 2014.
 Teaching Symposium attendance. *36th Annual Meeting of the American Society of Biomechanics*. Gainesville, Florida, USA. August 15-18, 2012.
 Development and Assessment of Teaching Effectiveness (DATE) evaluation. MUSC College of Health Professions. Summer semester, 2012.
 Teaching Symposium attendance. *35th Annual Meeting of the American Society of Biomechanics*. Long Beach, California, USA. August 10-13, 2011.
 Building Academic Teaching Skills (BATS) seminar series participation. MUSC College of Health Professions. Spring semester, 2009.

Research Supervisory Experience

MUSC Doctor of Physical Therapy (DPT) students

Zach Lanning	September 2019 – present
Daniel Miller	September 2019 – present
Daniel Sharpe	September 2019 – present
Blaire Sobolewski	September 2019 – present
Holly Knapp	June 2018 – August 2020
Meghan Bowman	September 2015 – August 2017
Kyle Maynard	September 2015 – August 2017
Josie Horne	September 2015 – April 2017
Jordan Broadway	September 2014 – May 2017
Erin Gaffney	September 2014 – May 2017
Liz Nyberg	September 2014 – May 2017
Carly Sacco	September 2014 – May 2017
Blake Bennett	September 2012 – May 2015
Megan Hrenchir	September 2012 – May 2015
Jill Hubbuch	September 2012 – May 2015
Devin Roden-Reynolds	September 2012 – May 2015
Cami Wasserman	September 2012 – May 2015
Stephanie Buffo	September 2011 – May 2014
Samantha Kubinski	September 2011 – May 2014
Christina McQueen	September 2011 – May 2014
Brad Rankin	September 2011 – May 2014
Keir Sittloh	September 2011 – May 2014
Ali Bunchman	October 2011 – May 2013
Molly Wellinghoff	October 2011 – May 2013
Lisa Floyd	January 2011 – May 2013
Taylor Holmes	January 2011 – May 2013
Chris Franz	December 2010 – May 2012
Eric Monsch	December 2010 – May 2012
Kristen Merritt	March 2010 – May 2011
Caroline Raburn	March 2010 – May 2011
Emily Hendrix	May 2009 – May 2010
Lindsay Hunter	May 2009 – May 2010

MUSC Health and Rehabilitation Science doctoral students

Aaron Embry	September 2016 – present
Amanda Herrmann	August 2013 – August 2017
Bobby Charalambous	September 2011 – October 2015
April Taylor	September 2009 – April 2010

College of Charleston undergraduate students

Amanda Anyim	June 2017 – August 2017
Alyssa Boscia	June 2017 – August 2017

Clemson University Bioengineering masters students

Preston Walker	September 2018 – August 2019
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Clemson University Bioengineering undergraduate students

Anna Comer	June 2019 – August 2019
Amelia Godolphin	June 2018 – August 2018
Victoria Schatzer	June 2018 – August 2018
Julia Brisbane	June 2017 – August 2017
Andrea Vera Martinez	June 2017 – August 2017
Rachel Turbeville	June 2017 – August 2017
Scott Creel	June 2011 – August 2011

University of Alberta Physical Education and Recreation students

Joanna Clair (PhD student)	January 2007 – July 2008
Lisa Yates (undergraduate student)	September 2005 – August 2006

University of Michigan undergraduate students

Juliana Ong	September 2004 – December 2004
Bilge Kiran	September 2003 – December 2003

Awards / Student Awards

Jesse Dean. MUSC Foundation Teaching Excellence Award: Educator-Lecturer. June 2020.
Preston Walker, Christian Finetto, Jesse Dean. 1st place, Research Category, MUSC Innovation Week Shark Tank. May 2019.
Jesse Dean. Scholar of the Year, College of Health Professions, MUSC. December, 2017.
Jesse Dean. Teacher of the Year (2 recipients), College of Health Professions, MUSC. December, 2017.
Amanda Anyim. Student Travel Award, Annual Biomedical Research Conference for Minority Students. November, 2017.
Jordan Broadway and Elizabeth Nyberg. President's Award for best poster at American Society of Biomechanics Annual Meeting. August, 2015.
Bobby Charalambous. American Society of Biomechanics Grant-In-Aid. April, 2015.
Jesse Dean. Pioneer Volunteer Faculty Leader in the CARES Therapy Clinic. November, 2013.
Bobby Charalambous. Student Travel Award, Gait and Clinical Movement Analysis Society Annual Meeting. May, 2013.
Jesse Dean. Developing Scholar of the Year, College of Health Professions, MUSC. October, 2012.
Bobby Charalambous. Student Travel Award, American Society of Biomechanics Annual Meeting. August, 2012.
Emily Hendrix. First place poster, Clinical/Professional/Masters section; MUSC Student Research Day. November, 2009.

Peer Review Experience

Journal Editorial Board Member

IEEE Transactions on Neural Systems and Rehabilitation Engineering (Associate Editor; 2020-present)

Journal Reviewer

Archives of Physical Medicine and Rehabilitation
Biological Cybernetics
BioMedical Engineering Online
Computer Methods in Biomechanics and Biomedical Engineering
Dysphagia
European Journal of Applied Physiology
Experimental Brain Research
Experimental Physiology
Frontiers in Human Neuroscience
Frontiers in Neurology
Frontiers in Sports and Active Living
Gait and Posture
Human Movement Science
IEEE Transactions on Neural Systems and Rehabilitation Engineering
Journal of Applied Biomechanics
Journal of Applied Physiology
Journal of Biomechanical Engineering
Journal of Biomechanics
Journal of Experimental Biology

Journal of NeuroEngineering and Rehabilitation
Journal of Neurophysiology
Journal of Neuroscience
Journal of Rehabilitation Research and Development
Journal of Sport and Health Science
Journal of the Royal Society Interface
Journal of Visualized Experiments
Measurement in Physical Education and Exercise Science
Neurorehabilitation and Neural Repair
PeerJ
Physical Therapy Journal
PLOS Computational Biology
PLOS ONE
Proceedings of the National Academy of Sciences
Proceedings of the Royal Society B: Biological Sciences
Royal Society Open Science
Scientific Reports
Spinal Cord
Topics in Spinal Cord Injury Rehabilitation

Grant Proposal Reviewer

Congressionally Directed Medical Research Programs; Spinal Cord Injury Research Program. *Ad hoc panel reviewer*
Department of Veterans Affairs; Rehabilitation R&D Service; SPiRE Program. *Ad hoc reviewer*
LSVT Global Student Small Grants for Treatment Efficacy Studies with Neurologically Impaired Patients. *Ad hoc reviewer*
MUSC Center on Aging Pilot Program. *Ad hoc reviewer*
MUSC National Center of Neuromodulation for Rehabilitation. *Ad hoc reviewer*
National Institutes of Health; Function, Integration, and Rehabilitation Sciences Subcommittee. *Ad hoc panel reviewer*
National Institutes of Health; Musculoskeletal Rehabilitation Sciences Study Section. *Ad hoc panel reviewer*
National Institutes of Health; National Center for Medical Rehabilitation Research. *Ad hoc panel reviewer*
National Science Foundation; Division of Behavioral & Cognitive Sciences; Perception, Action, and Cognition. *Ad hoc reviewer*
National Science Foundation; Division of Chemical, Bioengineering, Environmental and Transport Systems; General and Age-Related Disabilities Engineering. *Ad hoc panel reviewer*
Technology Foundation STW; High Tech Systems and Materials. *Ad hoc reviewer*
University of Delaware - CTR ACCEL Pilot Program. *Ad hoc reviewer*
University of Nebraska – multidisciplinary grant program. *Ad hoc reviewer*
US Army Medical Research and Materiel Command; Scientific Peer Advisory and Review Services division of the American Institute of Biological Sciences. *Ad hoc reviewer*

Conference Abstract Reviewer

American Society of Biomechanics

External Tenure Application Reviewer

University of Delaware; Kinesiology and Applied Physiology Department
University of Nevada Las Vegas; Department of Physical Therapy

University Service

University Level

Institutional Review Board alternate member	September 2019 – present
“Behind the Scenes” course shadowing proctor	Fall 2017 – Fall 2019
Student Research Day Judge	November 2014 – November 2017
Faculty Senate	October 2011 – September 2013
	October 2016 – September 2018
Faculty Senate Governance Committee	October 2016 – September 2018
Faculty Senate Institutional Advancement Committee	October 2009 – September 2012
Faculty Senate Executive Committee	October 2011 – September 2013
Faculty Senate alternate member	October 2009 – September 2011

College Level (Health Professions)

Innovative Online Teaching Workgroup
Interim Faculty Review Committee (*chair*)
Awards Committee

Development and Assessment of Teaching Effectiveness
Committee (*chair*)

PhD Program Steering Committee
Faculty Council

PT Faculty Search Committee (*chair*)
DATE Observation Team
Faculty Assembly Bylaws Committee
College Curriculum Committee
OT Faculty Search Committee
PT Faculty Search Committee
HRS Faculty Search Committee
Faculty Interim Review Guidelines Committee
Entrepreneurialism Committee
HRS Faculty Search Committee
Research Resource Group
Research Council
Budgetary Affairs Advisory Committee
Web Advisory Board / Research Focus Group

May 2020 – present
February 2019 – May 2019
July 2018 – June 2019
July 2014 – June 2015
July 2018 – June 2019

July 2016 – present
October 2011 – September 2013
July 2018 – June 2019
June 2016 – February 2017
August 2015 – December 2015
September 2014 – December 2015
August 2014 – July 2015
March 2014 – December 2014
February 2014 – August 2014
December 2013 – July 2014
May 2013 – August 2014
January 2012 – December 2012
December 2010 – April 2012
July 2010 – January 2011
February 2009 – present
December 2008 – June 2009
November 2008 – September 2012

Division Level (Physical Therapy)

CARES Neurorehabilitation Physical Therapy Clinic
Admissions Committee
Accreditation Facilities, Equipment, Technology, and
Materials Team
Outcomes Committee

May 2013 – present
July 2010 – present
December 2008 – January 2011

January 2018 - present