

## Steven A. Kautz

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### **EDUCATION**

University: University of California - Biomedical Engineering, Davis, CA  
Dates: September 1989-September 1992.  
Field of Study: Neuroscience - Dynamics/Controls  
Degree: Ph.D. September 1992.  
Research Advisor: Maury Hull, PhD  
Research Topic: Biomechanics of pedaling with non-circular chainrings in cycling

University: University of Texas - Kinesiology, Austin, TX  
Dates: August 1987-September 1989  
Field of Study: Biomechanics - Neural Control  
Degree: Ph.D. Preparation  
Research Advisors: Mike Feltner, PhD and Larry Abraham, PhD  
Research Topic: Biomechanics of pedaling in elite cyclists

University: University of Texas - Geology, Austin, TX  
Dates: January 1984-July 1987  
Field of Study: Geophysics  
Degree: Master of Arts - December 1987  
Research Advisor: John Sclater, PhD  
Research Topic: The importance of cryptic normal faulting in scale models of extensional tectonics

University: Michigan State University, Honors College - Geology, East Lansing, MI  
Dates: September 1979-June 1983  
Field of Study: Geophysics  
Degree: Bachelor of Science - May, 1983.

## **PROFESSIONAL EXPERIENCE**

Professor, Department of Physical Therapy, College of Public Health and Health Professions, University of Florida, Gainesville, FL, July 2009 - present.

Program Coordinator, Movement Science Track, Rehabilitation Sciences Doctoral Program, College of Public Health and Health Professions, University of Florida, Gainesville, FL, May 2005 - present.

Associate Professor, Department of Physical Therapy, College of Public Health and Health Professions, University of Florida, Gainesville, FL, October 2002 – June 2009.

Biomedical Engineer, Brain Rehabilitation Research Center, Malcom Randall VA Medical Center, Gainesville, FL, October 2002 - present.

Director, VA Rehabilitation Research Centers of Excellence and University of Florida Brooks Center for Rehabilitation Studies Human Motor Performance Laboratory, Gainesville, FL, October 2002 - present.

Biomedical Engineer, Neuromuscular Systems Group, Rehabilitation Research and Development Center, VA Medical Center, Palo Alto, CA, September 1992 - September 2002.

Consulting Associate Professor, Department of Functional Restoration, School of Medicine, Stanford University, Stanford, CA, July 2000 - September 2002.

Consulting Assistant Professor, Department of Functional Restoration, School of Medicine, Stanford University, Stanford, CA, 1994-2000.

Associate Instructor, Department of Mechanical Engineering, University of California, Davis, CA, Summer 1992. (Undergraduate Dynamics)

## **GRANTS**

### **Principal Investigator**

1. ***VA RR&D Supplement to Merit Review A6365-R, "Mechanisms of Response to Locomotor Training after Stroke"***  
SA Kautz (Principal Investigator)  
\$ 20,000  
July 2008
2. ***VA RR&D Supplement to Merit Review B3983, "Mechanisms of Response to Locomotor Training after Stroke"***  
SA Kautz (Principal Investigator)  
\$ 20,000  
July 2008
3. ***VA Rehabilitation R&D A6776S, "Research Career Scientist"***  
SA Kautz (Principal Investigator)  
\$405,000  
January 2009 – December 2013
4. ***VA Rehabilitation R&D Merit Review A6365-R, "Development of Evidence Based Parameter Selection for Locomotor Training"***  
SA Kautz and C Patten (Co-Principal Investigators)  
\$ 672,759  
July 2008 - June 2011
5. ***VA RR&D large equipment supplement to Merit Review B3983, "Mechanisms of Response to Locomotor Training after Stroke" (Vicon motion capture system upgrade)***  
SA Kautz (Principal Investigator)  
\$151,915  
May 2008
6. ***VA RR&D Supplement to Merit Review B3983, "Mechanisms of Response to Locomotor Training after Stroke"***  
SA Kautz (Principal Investigator)  
\$ 70,000  
April 2008
7. ***VA RR&D small equipment supplement to Merit Review B3983, "Mechanisms of Response to Locomotor Training after Stroke"***  
SA Kautz (Principal Investigator)  
\$ 15,005  
April 2008
8. ***NIH R01 NS055380, "Development of a SimTK-based framework for hemiparetic walking assessment"***  
RR Neptune (Principal Investigator)  
\$1,310,170  
Sub-contract from University of Texas  
SA Kautz (Principal Investigator)  
Total of subcontract: \$117,445  
April 2007 - March 2011

9. **VA Rehabilitation R&D Merit Review B3983-R, "Mechanisms of Response to Locomotor Training after Stroke"**  
SA Kautz (Principal Investigator)  
\$ 1,343,082  
September 2005 - August 2010  
(Note: To date, \$148,151 of contracts to other UF PI's has originated from this grant.)
10. **VA Rehabilitation R&D Merit Review B4024-I, "Differential effects of robotic vs. manually-assisted locomotor training"**  
AL Behrman and SA Kautz (Co-Principal Investigators)  
\$450,000  
October 2005 - September 2008
11. **NIH R01 HD46820, "Intermuscular coordination of hemiparetic walking"**  
SA Kautz (Principal Investigator)  
\$1,545,789  
June 2004 - June 2009
12. **VA Rehabilitation R&D Merit Review B2748R, "Influence of post-stroke gait on bone density"**  
SA Kautz and GS Beaupré, PhD (Co-Principal Investigators)  
\$495,500  
May 2002 - April 2005
13. **NIH 5P60 AG014635-IDS1, "Improving recovery after stroke"**  
Pamela W. Duncan PhD, PT (Principal Investigator), University of Kansas  
Sub-contract from University of Kansas  
SA Kautz (Principal Investigator)  
Total of subcontract: \$45,000  
January 2002 - December 2002
14. **NIH R01 HD37996, "Bilateral coordination of hemiparetic locomotion"**  
SA Kautz (Principal Investigator)  
\$869,443  
June 2000 - May 2006
15. **VA Rehabilitation R&D Merit Review E2116RC, "Coordination of hemiparetic movement after post-stroke rehabilitation"**  
SA Kautz and Pamela W. Duncan PhD, PT, Kansas City VA (Co-Principal Investigators)  
\$259,500  
January 2000 - October 2003
16. **NIH R01 NS17662, "Intermuscular coordination of mammalian movement"**  
FE Zajac (Principal Investigator), Stanford University  
Sub-contract from Stanford University  
SA Kautz (Principal Investigator)  
Total of subcontract: \$510,000  
January 2000 - December 2002
17. **The Whitaker Foundation (Rosslyn, VA) Biomedical Engineering Research Grant 95-0547, "Computer simulation analysis of coordination deficits in post-stroke hemiparesis"**

SA Kautz (Principal Investigator)  
\$209,906  
September 1996 - April 2000

18. ***NIH R01 NS17662***, "Intermuscular coordination of mammalian movement"  
FE Zajac (Principal Investigator), Stanford University  
Sub-contract from Stanford University  
SA Kautz (Principal Investigator)  
Total of subcontract: \$540,000  
July 1995 - December 1999
19. ***VA Palo Alto Health Care System New Investigator Award***, "Coordination deficits in post-stroke hemiparesis"  
SA Kautz (Principal Investigator)  
\$10,000  
October 1997-September 1998
20. ***Foundation for Physical Therapy (Alexandria, VA) Research Grant***, "Does increased exertion affect motor performance during pedaling exercise in hemiplegia?"  
SA Kautz and DA Brown, PhD, PT (Co-Principal Investigators)  
\$55,710  
July 1993 - July 1995

#### **Co-Investigator**

***VA Rehabilitation R&D Service Center Proposal, F2182C***. "Brain Rehabilitation Research Center, VA Center of Excellence"  
Leslie Gonzalez-Rothi (Principal Investigator)  
SA Kautz (Co-Investigator, Head of "Motor performance measurement" core)  
\$4,000,000  
July 2009 - June 2014

***Quebec Rehabilitation Research Network Collaborative Clinical Research Award***, "Quantification of the effects of mass during walking with and without body weight support in persons with chronic hemiparesis"  
S Nadeau (Principal Investigator)  
SA Kautz (Co-investigator)  
\$25,000 (Canadian dollars)  
May 2008 - April 2009  
(Dr. Sylvie Nadeau, Associate Professor at the University of Montreal, performed a sabbatical in Dr. Kautz's laboratory during February-March 2008 and is scheduled to return in spring 2009)

***NIH-T32 HD043730-06*** "Interdisciplinary Pre-doctoral Training in Neuromuscular Plasticity and Rehabilitation"  
K Vandenberg (PI)  
SA Kautz (Faculty Mentor)  
\$1,582,899 (Total Direct)  
06/11/03-04/30/13  
(The objective of this proposal is to acquire funding to train pre-doctoral students. The training program reinforces interdisciplinary interactions and translational research in neuromuscular plasticity and rehabilitation)

**NIH K12-HD055929-01 "Rehabilitation Research Career Development Program"**

K Ottenbacher, (Director), K Vandenborne (Deputy-Director)

SA Kautz (Lead Mentor)

\$2,977,305 (Total Direct)

09/25/07-08/31/12

(The objective of this RRCD program is to recruit and train rehabilitation scientists who are occupational and physical therapists. This program will provide trainees with the skills necessary to become independent investigators and future leaders and mentors in rehabilitation.)

**NIH P30 AG028740, "Claude D. Pepper Older Americans Independence Center"**

Pahor (PI)

SA Kautz (Co-investigator)

\$602,141

6/1/07 - 3/31/12

**VA Rehabilitation R&D Merit Review B5037, "Experimental rehabilitation following cervical-SCI & functional outcomes"**

Prodip Bose (Principal Investigator)

SA Kautz (Co-investigator)

\$747,400

1/1/08-12/31/11

**BSCIRTF Pilot Proposal, "Immediate Effects of Robotic- vs. Manual-assisted Locomotor Training on Neuromuscular Plasticity after Incomplete SCI "**

AL Behrman (Principal Investigator)

SA Kautz (Co-investigator)

\$57,000

October 2004 - June 2005

**VA Rehabilitation R&D Service Center Proposal, F2182C. "Brain Rehabilitation Research Center, VA Center of Excellence"**

Leslie Gonzalez-Rothi (Principal Investigator)

SA Kautz (Co-Investigator, Head of "Motor performance measurement" core)

\$4,000,000

July 2004 - June 2009

**VA Rehabilitation R&D Service Center Proposal, F2182C. "Brain Rehabilitation Research Center, VA Center of Excellence"**

Leslie Gonzalez-Rothi (Principal Investigator)

SA Kautz (Co-Investigator, Head of "Motor performance measurement" core)

\$1,175,000.

Oct 2002-June 2004

**VA Rehabilitation R&D Pilot B2607P, "Harness-Supported Treadmill Training in Post-Stroke Hemiparesis"**

FE Zajac (Principal Investigator)

April 2002 - March 2004

**VA Rehabilitation R&D Merit Review, "Graded weight-bearing exercise for improving ambulation after stroke"**

David A. Brown, PhD, PT and Charles Bugar, MD (Co-Principal Investigators)  
April 1997 - April 2000

### **Mentored awards**

#### ***VA Rehabilitation R&D Career Development II Award***

"Adaptability of walking in persons with neurological disorders"

Dave Clark (Principal Investigator)

SA Kautz (Primary mentor)

\$350,000

January 2010-December 2013

#### ***VA Rehabilitation R&D Career Development I Award***

"Adaptability of walking in persons with neurological disorders"

Mark Bowden (Principal Investigator)

SA Kautz (Primary mentor)

\$166,500

January 2010-December 2011

#### ***VA Rehabilitation R&D Career Development II Award***

"Skeletal muscle properties and the metabolic cost of walking post-stroke"

Chris Gregory (Principal Investigator)

SA Kautz (Primary mentor)

\$350,000

July 2008-July 2011

#### ***VA Rehabilitation R&D Career Development II Award***

"A Toolbox for Measuring Post-Stroke Upper Extremity Motor Ability"

Michelle Woodbury (Principal Investigator)

SA Kautz (Tertiary mentor)

\$350,000

October 2008-September 2011

#### ***NIH K12 Scholarship***

Chris Gregory (Principal Investigator)

SA Kautz (Primary mentor)

January 2008- December 2010

#### ***VA Rehabilitation R&D Career Development I Award***

"Neuronal Coupling: Arm Swing and Leg Muscle Activation during Locomotion"

Nicole Tester (Principal Investigator)

SA Kautz (Tertiary mentor)

\$126,528

January 2008-January 2010

#### ***VA Rehabilitation R&D Career Development I Award***

"Adaptability of walking in persons with neurological disorders"

Dave Clark (Principal Investigator)

SA Kautz (Primary mentor)

\$126,528

September 2007-September 2009

***VA Rehabilitation R&D Career Development II Award***

"Should we train strength or just skill in post-stroke rehabilitation"

Lorie Richards (Principal Investigator)

SA Kautz (Tertiary mentor)

\$383,168

September 2007-September 2010

***VA Rehabilitation R&D Career Development II Award #4941***

"Adaptivity and ability of internal mechanisms of falls aversion"

Brian Schulz (Principal Investigator)

SA Kautz (Secondary mentor)

\$345,540

October 2007- October 2010

***NIH K01 HD052713***

"Muscle Weakness and Post-Traumatic Knee OA"

Terese Chmielecki (Principal Investigator)

SA Kautz (Member of semi-annual advisory committee)

\$526,819 (Direct \$487,907)

July 2007- June 2012

***VA Rehabilitation R&D Associate Investigator***

"Measuring Post-stroke Arm Motor Ability: Measurement Properties of the Fugl-Meyer Upper Extremity Assessment Examined with Item Response Theory Framework"

Michelle Woodbury (Principal Investigator)

L Richards, J Kleim & SA Kautz (Co-mentors)

\$120,000

October 2006-September 2008

***VA Rehabilitation R&D Associate Investigator***

"Neuromuscular function and locomotor ability in persons after central nervous system injury"

Chris Gregory (Principal Investigator)

SA Kautz & K Vandenborne (Co-mentors)

\$120,000

May 2005-September 2007

***VA Rehabilitation R&D Associate Investigator***

Toni Chiara (Principal Investigator)

C Sapienza & SA Kautz (Co-mentors)

\$120,000

April 2004-March 2006

**Student Grants**

***PHHP Graduate Student Research Grant***

"Swing phase dynamics during hemiparetic walking: Step-to-step variability. "

CK Balasubramanian (Principal Investigator)

\$1000

April 2007

## Contracts

VA Contract #V248-P-0588 (Malcom Randall VA Medical Center)  
SA Kautz (UF Principal Investigator), Gonzalez-Rothi (VA Principal Investigator)  
\$19,410  
For: Data storage and computer backup support  
September 2008 – August 2009

VA Contract #VA248-P-0543 (Malcom Randall VA Medical Center)  
SA Kautz (UF Principal Investigator), Behrman (VA Principal Investigator)  
\$31,000 (Direct costs)  
For: Locomotor initiative personnel  
July 2008 - June 2009

VA Contract #V248-P-0534 (Malcom Randall VA Medical Center)  
SA Kautz (UF Principal Investigator), Gonzalez-Rothi (VA Principal Investigator)  
\$16,500 (Direct costs)  
For: Human motor performance laboratory personnel  
May 2008 -Sept 2009  
(Note: \$70,000 total cost, but \$53,500 that originated from **VA RR&D Supplement to Merit Review B3983** has been excluded since it was listed with that grant)

VA Contract # VA248-P-0445 (Malcom Randall VA Medical Center)  
SA Kautz (UF Principal Investigator), Behrman (VA Principal Investigator)  
\$17,900 (Direct costs)  
For: Locomotor initiative personnel  
April 2008 - Sept 2009

VA Contract # VA248-P-0405 (Malcom Randall VA Medical Center)  
SA Kautz (UF Principal Investigator), Patten (VA Principal Investigator)  
\$5,836 (Direct costs)  
For: Locomotor initiative personnel  
Feb 2008 - Feb 2009

VA Contract # VA248-P-0304 (Malcom Randall VA Medical Center)  
SA Kautz (UF Principal Investigator), Patten (VA Principal Investigator)  
\$12,000 (Direct costs)  
For: Research assistance  
Nov 2007 - Nov 2008

VA Contract # VA248-pc-0114 (Malcom Randall VA Medical Center)  
SA Kautz (UF Principal Investigator), Behrman (VA Principal Investigator)  
\$20,800 (Direct costs)  
For: Locomotor initiative personnel  
Aug 2007 -March 2008

VA Contract (Malcom Randall VA Medical Center)  
SA Kautz (UF Principal Investigator), Behrman (VA Principal Investigator)  
\$15,110 (Direct costs)  
For: Locomotor initiative personnel  
Aug 2007 - April 2008

VA Contract # VA248-P-0050 (Malcom Randall VA Medical Center)

SA Kautz (UF Principal Investigator), Gonzalez-Rothi (VA Principal Investigator)  
\$11,353 (Direct costs)  
For: Human motor performance laboratory personnel  
April 2007 - Sept 2007

VA Contract # V573-P-7090 (Malcom Randall VA Medical Center)  
SA Kautz (UF Principal Investigator), Behrman (VA Principal Investigator)  
\$24,269 (Direct costs)  
For: Locomotor initiative personnel  
March 2007 - Sept 2007

VA Contract # V573-P-6955 (Malcom Randall VA Medical Center)  
SA Kautz (UF Principal Investigator), Gonzalez-Rothi (VA Principal Investigator)  
\$11,353 (Direct costs)  
For: Human motor performance laboratory personnel  
Sept 2006 - March 2007

VA Contract # V573-P-6908 (Malcom Randall VA Medical Center)  
SA Kautz (UF Principal Investigator), Behrman (VA Principal Investigator)  
\$14,766 (Direct costs)  
For: Human motor performance laboratory personnel  
July 2006 - June 2007

VA Contract # V573-P-6908 (Malcom Randall VA Medical Center)  
Kautz (UF Principal Investigator), Gonzalez (VA Principal Investigator)  
\$34,894 (Direct costs)  
For: Human motor performance laboratory personnel  
Sept 2005 - August 2006

VA Contract # V573-P-6563 (Malcom Randall VA Medical Center)  
Kautz (UF Principal Investigator), Gonzalez Rothi (VA Principal Investigator)  
\$65,418 (Direct costs)  
For: Human motor performance laboratory personnel  
October 2004 - Sept 2005

VA Contract # V573P-6517 (Malcom Randall VA Medical Center)  
Kautz (UF Principal Investigator), Gonzalez Rothi (VA Principal Investigator)  
\$54,000 (Direct costs)  
For: Human motor performance laboratory personnel  
August 2004 - Sept 2005

VA Contract # V573P-6318 (Malcom Randall VA Medical Center)  
Kautz (UF Principal Investigator), Gonzalez Rothi (VA Principal Investigator)  
\$34,000 (Direct costs)  
For: Human motor performance laboratory personnel  
October 2003 - Sept 2004

## **PUBLICATIONS**

### **Refereed Journal Articles & Book Chapters**

1. Patten C, Gonzalez-Rothi EJ, Little VL and Kautz SA. (2009) Invited commentary on "Allowing intralimb kinematic variability during locomotor training poststroke improves kinematic consistency: a subgroup analysis from a randomized clinical trial." *Phys Ther*; **89**:e1-2.
2. Bowden MG, Clark DJ and Kautz SA (2009). Evaluation of abnormal synergy patterns post-stroke: relationship of the Fugl-Meyer assessment to hemiparetic locomotion. *Neural Repair & Neurorehabilitation* (in press).
3. Neptune RR, Zajac FE and Kautz SA (2009). Author's Response to Comment on "Contributions of the individual ankle plantar flexors to support, forward progression and swing initiation during walking" (Neptune et al., 2001) and "Muscle mechanical work requirements during normal walking: The energetic cost of raising the body's center-of-mass is significant" (Neptune et al., 2004). *J Biomech* (in press).
4. Neptune RR, Clark DJ and Kautz SA (2009). Modular control of human walking: A simulation study. *J Biomech* (in press).
5. Neptune RR, McGowan CP and Kautz SA (2009). Forward dynamics simulations provide insight into muscle mechanical work during human locomotion. *Exer Sports Sci Rev*, **37**:203-210.
6. Sasaki K, Neptune RR and Kautz SA (2009). The relationships between muscle, external, internal and joint mechanical work during normal walking. *J Experimental Biology*, **212**:738-744.
7. Balasubramanian CK, Neptune RR and Kautz SA (2009). Variability in spatiotemporal step characteristics and its relationship to walking performance post-stroke *Gait & Posture*, **29**:408-414
8. Woodbury ML, Howland D, McGuirk TE, Davis S, Senesac C, Kautz SA and Richards LG (2009). Effects of trunk restraint combined with intensive task-practice on post-stroke upper extremity reach and function: a pilot study. *Neural Repair & Neurorehabilitation*, **23**:78-91.
9. Sullivan KJ, Mulroy S and Kautz SA (2009). Walking Recovery and Rehabilitation after Stroke. In: *Stroke Recovery and Rehabilitation* (Edited by J Stein, Zorowitz, R Harvey, R Macko, and C Winstein), pp. 323-342. Demos Medical Publishing, New York, NY.
10. Bowden MG, Balasubramanian CK, Behrman AL and Kautz SA (2008). Validation of a Speed-Based Classification System Using Quantitative Measures of Walking Performance Post-Stroke. *Neural Repair & Neurorehabilitation*, **22**:672-675.
11. Goldberg EJ, Neptune RR and Kautz SA (2008). Can Treadmill Walking be used to Assess Propulsion Generation? *J Biomech*, **41**:1805-1808.
12. Neptune RR, Sasaki K and Kautz SA (2007). The effect of walking speed on muscle function and mechanical energetics. *Gait & Posture*, **28**:135-143.

13. Turns L, Neptune RR and Kautz SA (2007). Relationships between muscle activity and anteroposterior ground reaction forces in hemiparetic walking. *Arch Phys Med Rehab*, **88**:1127-1135.
14. Balasubramanian CK, Bowden MG, Neptune RR and Kautz SA (2007). Relationship between step length asymmetry and walking performance in subjects with chronic hemiparesis. *Arch Phys Med Rehab*, **88**:43-49.
15. Gregory C, Bowden MG, Jayaraman A, Shah P, Behrman AL, Kautz SA and Vandenberg K (2007). Resistance training and locomotor recovery after incomplete spinal cord injury: A case series. *Spinal Cord*, **45**:522-530.
16. Plummer P, Behrman AL, Duncan PW, Spigel P, Saracino D, Martin J, Fox E, Thigpen M and Kautz SA (2007). Effects of stroke severity and training duration on locomotor recovery after stroke: A pilot study. *Neurorehab. Neural Repair*, **21**:137-151.
17. Bowden MG, Balasubramanian CK, Neptune RR and Kautz SA (2006). Anterior-Posterior Ground Reaction Forces as a Measure of Paretic Leg Contribution in Hemiparetic Walking. *Stroke*, **37**:872-876.
18. Kautz SA, Patten C and Neptune RR (2006). Does unilateral pedaling activate a rhythmic locomotor pattern in the non-pedaling leg in post-stroke hemiparesis?. *J Neurophys*, **95**:3154-3163.
19. Higginson JS, Zajac FE, Neptune RR, Kautz SA and Delp SL (2006). Muscle contributions to support in post-stroke hemiparetic gait. *J. Biomech*, **39**:1769-1777.
20. Higginson JS, Zajac FE, Kautz SA, Neptune RR, Burgar CG and Delp SL (2006). Musculoskeletal response to equinus foot placement. *Gait & Posture*, **23**:32-36.
21. Worthen LC, Kim M, Kautz SA, Lew HL, Kiratli J and Beaupré GS (2005). Key characteristics of walking correlate with bone density in chronic stroke survivors. *J. Rehab R&D*, **42**:761-768.
22. Kautz SA, Duncan PW, Perera S, Neptune RR and Sudenski SA (2005). Coordination of hemiparetic locomotion after post-stroke rehabilitation. *Neurorehabilitation & Neural Repair*, **19**:250-258.
23. Kautz SA and Patten C (2005). Interlimb influences on paretic leg muscle excitation. *J Neurophys*, **93**: 2460-2473.
24. Neptune RR, Zajac FE and Kautz SA (2004). Muscle mechanical work requirements during normal walking: the energetic cost of raising the body's center of mass is significant. *J Biomech*, **37**:817-825.
25. Neptune RR, Zajac FE and Kautz SA (2004). Muscle force redistributes segmental power for body progression during walking. *Gait Posture*, **19**:194-205.
26. Zajac FE, Neptune RR, and Kautz SA (2004). Authors response to Comments on Biomechanics and Muscle Coordination of Human Walking: Parts I and II. *Gait Posture*, **19**:208-209.

27. Zajac FE, Neptune RR, and Kautz SA (2003). Biomechanics and Muscle Coordination of Human Walking: Part II: Lessons from Dynamical Simulations and Clinical Implications *Gait Posture*, **17**:1-17.
28. Zajac FE, Neptune RR, and Kautz SA (2002). Biomechanics and Muscle Coordination of Human Walking: Part I: Introduction to Concepts, Power Transfer, Dynamics and Simulations. *Gait Posture*, **16**:215-232.
29. Pohl PS, Duncan PW, Perera S, Long J, Liu W, Zhou J and Kautz SA (2002). Rate of isometric knee extension strength development and walking speed after stroke. *J Rehab R & D*, **39**: 651–658.
30. Kautz SA and Neptune RR (2002). Biomechanical determinants of pedaling energetics: internal and external work are not independent. *Exer Sports Sci Rev*, **30**:159-165.
31. Kautz SA, Brown DA, Van der Loos HFM, and Zajac FE (2002). Mutability of bifunctional thigh muscle activity in pedaling due to contralateral leg force generation. *J Neurophys*, **88**:1308-1317.
32. Neptune RR, Kautz SA and Zajac FE (2001). Letter to the Editor - Comments on 'Propulsive adaptation to changing gait speed'. *J Biomech*, **34**: 1667-1668.
33. Neptune RR, Kautz SA and Zajac FE (2001). Contributions of the ankle plantar flexors to support, forward progression and swing initiation during walking. *J Biomech*, **34**: 1387-1398.
34. Neptune RR, and Kautz SA (2001). Muscle activation and deactivation dynamics: the governing properties in fast cyclical human movement performance? *Exer Sport Sci Rev*, **29**:76-81.
35. Chen G, Kautz SA and Zajac FE (2001). Simulation analysis of muscle activity changes with altered body orientations during pedaling. *J Biomech*, **34**:749-756.
36. Neptune RR and Kautz SA (2000). Knee joint loading in forward versus backward pedaling: implications for rehabilitation strategies. *Clinical Biomech*, **15**:528-535.
37. Ting LH, Kautz SA, Brown DA and Zajac FE (2000). Contralateral movement and extensor force generation alter flexion phase muscle coordination in pedaling. *J Neurophys*, **83**:3351-3365.
38. Neptune RR, Kautz SA and Zajac FE (2000). Muscle contributions to specific biomechanical functions do not change in forward versus backward pedaling. *J Biomech*, **33**:155-164.
39. Kautz SA, Neptune RR and Zajac FE (2000). General coordination principles elucidated by forward dynamics: Minimum fatigue does not explain muscle excitation in dynamic tasks. *Motor Control*, **4**:75-80.
40. Brown DA and Kautz SA (1999). Speed-dependent reductions of force output in people with poststroke hemiparesis. *Phys Ther*, **79**:919-930.
41. Ting LH, Kautz SA, Brown DA and Zajac FE (1999). Phase reversal of biomechanical functions and muscle activity in backward human locomotion. *J Neurophys*, **81**:544-551.

42. Kautz SA and Brown DA (1998). Relationships between timing of muscle excitation and impaired motor performance during cyclical lower extremity movement in post-stroke hemiplegia. *Brain*, **121**:515-526.
43. Ting, LH, Raasch, CC, Brown, DA, Kautz, SA and Zajac, FE (1998). Sensorimotor state of the contralateral leg affects ipsilateral muscle coordination of pedaling. *J Neurophys*, **80**: 1341-1351.
44. Brown DA, and Kautz SA (1998). Increased workload enhances force output during pedaling exercise in persons with poststroke hemiplegia. *Stroke*, **29**:598-606.
45. Neptune RR, Kautz SA and Hull ML (1997). The effect of pedaling rate on coordination in cycling. *J Biomech*, **30**:1051-1058.
46. Brown DA, Kautz SA and Dairaghi CA (1997). Muscle activity adapts to anti-gravity posture during pedaling in persons with post-stroke hemiplegia. *Brain*, **120**: 825-837.
47. Brown DA, Kautz SA and Dairaghi CA (1996). Muscle activity patterns are altered during pedaling at different body orientations. *J Biomech*, **29**: 1349-1356.
48. Kautz SA and Hull ML (1995). Dynamic optimization analysis for equipment setup problems in endurance cycling. *J Biomech*, **28**: 1391-1401.
49. Kautz SA and Hull ML (1995). Optimization analysis: A tool for improving cycling performance. In: *High Tech Cycling* (Edited by E. Burke), pp. 117-143. Human Kinetics, Champaign IL.
50. Kautz SA, Hull ML and Neptune RR (1994). A comparison of muscular mechanical energy expenditure and internal work in cycling. *J Biomech*, **27**: 1459-1467.
51. Kautz SA and Hull ML (1993). A theoretical basis for interpreting the force applied to the pedal in cycling. *J Biomech*, **26**:155-165.
52. Hull ML, Williams M, Williams K and Kautz SA (1992). Physiological response to cycling with both circular and non-circular chainrings. *Med Sci Sports Exer*, **24**: 1114-1122.
53. Hull ML, Kautz SA and Beard A (1991). An angular velocity profile in cycling derived from mechanical energy analysis. *J Biomech*, **24**:577-586.
54. Coyle EF, Feltner ME, Kautz SA, Hamilton M, Montain S, Baylor AM, Abraham L and Petrek G. (1991). Physiological and biomechanical factors associated with elite endurance cycling performance. *Med Sci Sports Exer*, **23**: 93-107.
55. Kautz SA, Feltner ME, Coyle EF and Baylor AM (1991). Pedaling technique of elite endurance cyclists: changes with increasing workload at constant cadence. *Int J Sports Biomech*, **7**: 29-53.
56. Kautz SA and Sclater JG (1988). Internal block deformation in clay models and applications to regions of extension. *Tectonics* **7**:823-832.

## **In review**

57. McGowan CP, Neptune RR, Clark DJ and Kautz SA (2009). Modular control of human walking: Adaptations to altered mechanical demand. *J Biomech* (submitted 5/09).
58. Beaman CB, Peterson CL, Neptune RR and Kautz SA (2009). Differences in self-selected and fastest comfortable walking in post-stroke hemiparetic persons. *Gait & Posture* (submitted 5/09)
59. Peterson CL, Neptune RR and Kautz SA (2009). Increasing leg extension is an important mechanism for increasing paretic leg propulsion in hemiparetic walking. *Physical Therapy* (submitted 2/09)
60. Clark DJ, Neptune RR, Ting LH, Zajac FE and Kautz SA (2009). Modular organization of muscle activity underlying locomotor control and recovery following stroke. *J Neurophysiology* (submitted 7/09)
61. Nair PM, Rooney KL, Kautz SA and Behrman AL (2009). Stepping with an ankle foot orthosis re-examined: A neuromechanical perspective for clinical decision making. *Clinical Biomech* (Submitted 6/09)
62. Trinastic, JP, Kautz SA, McGregor K, Gregory C, Bowden M, Benjamin MB, Kleim JA, Kleim E, Kurtzman M, Chang YL, Conway T, Crosson B (2009). An fMRI study examining differences in brain activity during active ankle dorsiflexion and plantarflexion. *Behavioural Brain Research* (submitted 4/09)

## **Articles in Conference Proceedings**

1. Van der Loos HFM, Kautz SA, Schwandt DF, Anderson J, Chen G, and Bevely DM (2002). A split-crank, servomotor-controlled bicycle ergometer design for studies in human biomechanics. Proceedings of IEEE/RSJ International Conference on Intelligent Robots and Systems, Lausanne, Switzerland, pp 1409-1414.
2. Ting LH, Kautz SA, Brown DA, Van der Loos HFM and Zajac FE (1998). Bilateral integration of sensorimotor signals during pedaling. *Ann N Y Acad Sci*; 860:513-516.
3. Kautz SA, Brown DA and Dairaghi CA (1994): Effects of increased exertion on motor performance during pedaling exercise in a neurologically normal population. In: *Vestibular and Neural Front: Proceedings of the 12th International Symposium on Posture and Gait* (Edited by K. Taguchi, M. Igarashi, and S. Mori), pp. 223-226. Elsevier, Amsterdam.
4. Brown DA, Burgar CG, Kautz SA, Dairaghi CA, and Gabrielli S (1994): Improving lower extremity force symmetry in individuals with hemiplegia. In *Vestibular and Neural Front: Proceedings of the 12th International Symposium on Posture and Gait* (Edited by K. Taguchi, M. Igarashi, and S. Mori), pp. 263-266. Elsevier, Amsterdam.
5. Kautz SA and Hull ML (1991). The relationship between mechanical energy expenditure and internal work during cycling. In *Advances in Bioengineering* (Edited by R. Vanderby), Vol. BED-20, pp. 57-61. ASME, New York.

### **Published Abstracted Scientific Presentations**

1. McGowan CP, Kautz SA and Neptune RR (2009). Modular control of human movement: adaptations to altered mechanical demand. International Society of Biomechanics. July 2009, Cape Town, South Africa.
2. Neptune RR, Clark DJ and Kautz SA (2009). Modular control of human walking: a modeling and simulation study. American Society of Mechanical Engineers 2007 Summer Bioengineering Conference. June 2009, Lake Tahoe, CA.
3. Fox E, Kautz SA, Clark DJ, Suter S, Day K, Gill L and Behrman AL (2009). Reduced modular complexity accounts for muscle activation during walking in persons with incomplete spinal cord injury. 19<sup>th</sup> Conference of the International Society for Gait and Posture Research. June 2009, Bologna, Italy.
4. Day K, Kautz SA and Behrman AL (2009). Head stabilization: one dimension of balance control during walking post-spinal cord injury. 19<sup>th</sup> Conference of the International Society for Gait and Posture Research. June 2009, Bologna, Italy.
5. Kautz SA, Clark DJ, Nott C and Neptune RR (2009). Computational and experimental validation of the relationship between experimentally derived muscle activation modules and their biomechanical consequences. Theoretical ideas in motor systems neuroscience and their capacity for falsification. April 2009, Kona, Hawaii.
6. Beamen C, Peterson CL, Neptune RR and Kautz SA (2009). Differences in Self-Selected and Fastest Comfortable Walking in Post-stroke Hemiparetic Persons. 26<sup>th</sup> Annual Houston Conference on Biomedical Engineering Research, The Houston Society for Engineering in Medicine and Biology. March 2009, Houston, TX.
7. Bowden MG, Clark DJ, and Kautz SA (2009). Evaluation of Abnormal Synergy Patterns Post-Stroke: Relationship of Clinical Examination to Hemiparetic Locomotion. American Physical Therapy Association Combined Sections Meeting. February 2009, Las Vegas, NV. (Podium presentation)
8. Gregory C, Bowden MG, Patten C, Vandeborne K, Kautz SA (2009). Improved Metabolic Efficiency Post Stroke is Associated with Increased Walking Velocities. American Physical Therapy Association Combined Sections Meeting, February, 2009, Las Vegas, NV.
9. Riesterer K, Beaulieu AN, Gregory C, Bowden MG, Kautz SA, Vandeborne K (2009). Lower-Extremity Strength and Activation Deficits Correlate with Maximum Gait Speed Following Incomplete Spinal Cord Injury. American Physical Therapy Association Combined Sections Meeting, February, 2009, Las Vegas, NV.
10. Day KV, Gill L, Kautz SA and Behrman AL (2009). Does compensation with an assistive device mask recovery of dynamic walking stability after spinal cord injury. American Physical Therapy Association Combined Sections Meeting. February 2009, Las Vegas, NV.
11. Fox EJ, Tester NJ, Subramanian S, Kautz SA, Howland D and Behrman AL (2009). Patterns of motor recovery in a child with severe, incomplete SCI. American Physical Therapy Association Combined Sections Meeting. February 2009, Las Vegas, NV. (Podium presentation)
12. Sasaki, K., Neptune, R.R. and Kautz, S.A. (2008). Differences between joint work and muscle fiber work during steady-state walking. *North American Congress on Biomechanics (NACOB)*. August 5-9, Ann Arbor, MI
13. Peterson, C.L., Neptune, R.R. and Kautz, S.A. (2008). Differences in correlations of anterior-posterior ground reaction forces with paretic and control leg gait variables. *North American Congress on Biomechanics (NACOB)*. August 5-9, Ann Arbor, MI

14. Allen, J.L., Bowden, M.G., Kautz, S.A. and Neptune, R.R. (2008). Mechanisms underlying increased walking speed after rehabilitation in persons with post-stroke hemiparesis. *North American Congress on Biomechanics (NACOB)*. August 5-9, Ann Arbor, MI
15. Kautz SA, Clark DJ and Neptune RR (2008). Deficits in voluntary modulation of step length in hemiparetic walking. Neural Control of Movement Annual Meeting. April 2008, Naples, FL.
16. Bowden MG and Kautz SA (2008). Evaluation of abnormal synergy patterns post-stroke: relationship of clinical examination to hemiparetic locomotion. Neural Control of Movement Annual Meeting. April 2008, Naples, FL.
17. Balasubramanian CK, Knight R, Subramanian S, Neptune RR and Kautz SA (2008). Evaluation of the neuromotor mechanisms underlying step length asymmetry patterns during hemiparetic walking using a novel methodology of step-by-step variability in gait data. Neural Control of Movement Annual Meeting. April 2008, Naples, FL.
18. Clark DJ, Subramanian S, Neptune RR and Kautz SA (2008). Fewer Basic Activation Patterns Account for Lower Extremity EMG During Walking in Adults Post-Stroke Compared to Healthy Controls. Neural Control of Movement Annual Meeting. April 2008, Naples, FL.
19. Fox E, Tester N, Subramanian S, Kautz SA, Howland D and Behrman AL (2008). Two Muscle Synergies Account for Pattern of Walking Recovery in a Child with SCI. Neural Control of Movement Annual Meeting. April 2008, Naples, FL.
20. Tester N, Howland D, Kautz SA, Zehr EP, Behrman AL (2008). Interlimb Coordination during Walking Post-SCI, Christopher and Dana Reeve Foundation Spinal Cord Symposium 2008. May 2008, Atlanta, GA.
21. Woodbury ML, Richards LG, McGuirk TE, Davis SB., Senesac C, Howland D and Kautz SA (2008) Can "Normal" Post-Stroke Reach be Retrained? American Occupational Therapy Association National Conference. April 2008, Long Beach, CA.
22. Kautz SA, Clark DJ and Neptune RR (2008). Theoretical and experimental analyses of walking in persons with post-stroke hemiparesis, 25<sup>th</sup> Annual Houston Conference on Biomedical Engineering Research, The Houston Society for Engineering in Medicine and Biology. February 2008, Houston, TX.
23. Allen CL, Bowden MG, Kautz SA and Neptune RR (2008). Identifying contributing factors to increased paretic propulsion post-rehabilitation: a case study. 25<sup>th</sup> Annual Houston Conference on Biomedical Engineering Research, The Houston Society for Engineering in Medicine and Biology. February 2008, Houston, TX.
24. Bowden MG, Balasubramanian CK, Behrman AL and Kautz SA (2008). Validation of a speed-based classification system using quantitative measures of walking performance post-stroke. APTA Combined Sections Meeting. February 2008, Nashville, TN.
25. Day KV, Gill L, Kautz SA and Behrman AL (2008). Exploring measures of walking stability in incomplete spinal cord injury. APTA Combined Sections Meeting. February 2008, Nashville, TN. (Podium presentation)
26. Woodbury ML, Richards LG, McGuirk TE, Davis S, Senesac C, Howland D and Kautz SA (2007). Effect of intensive massed task-practice with and without trunk restraint on post-stroke upper extremity reaching kinematics and functional ability. Annual Meeting of the Society for Neuroscience, November 2007, San Diego, CA.
27. Richards LG, Woodbury ML, McGuirk TE, Davis S, Patterson T and Kautz SA (2007). Relationship of grasp and transport kinematics of a reaching-to-target task before and

- after functional task practice: a case study. Annual Meeting of the Society for Neuroscience, November 2007, San Diego, CA.
28. McGuirk TE, Woodbury ML, Kautz SA and Richards LG (2007). A complete description of post-stroke upper extremity 3D kinematics in both proximal and distal joints: a new experiment protocol. Annual Meeting of the Society for Neuroscience, November 2007, San Diego, CA.
  29. Neptune RR, Sasaki K and Kautz SA (2007). Muscle mechanical work adaptations with increasing walking speed. American Society of Mechanical Engineers 2007 Summer Bioengineering Conference. June 2007, Keystone, CO.
  30. Peterson CL, Neptune RR and Kautz SA (2007). Inappropriate flexor synergies influence walking mechanics that reduce paretic propulsion in persons with post-stroke hemiparesis. 18<sup>th</sup> Conference of the International Society for Gait and Posture Research. July 2007, Burlington, VT.
  31. Bowden MG, Behrman AL and Kautz SA (2007). Mechanisms of response to locomotor training post-stroke: systematic assessment of motor pattern restitution. 18<sup>th</sup> Conference of the International Society for Gait and Posture Research. July 2007, Burlington, VT.
  32. Balasubramanian CK, Bowden MG, Neptune RR and Kautz SA (2007). Gait variability after a stroke and its relationship to hemiparetic severity and walking balance. 18<sup>th</sup> Conference of the International Society for Gait and Posture Research. July 2007, Burlington, VT.
  33. Kautz SA, Balasubramanian CK, Bowden MG and Neptune RR (2007). Comparison of treadmill and overground walking at self-selected speed in persons with post-stroke hemiparesis. 18<sup>th</sup> Conference of the International Society for Gait and Posture Research. July 2007, Burlington, VT.
  34. Kautz SA, Patten C, Neptune RR, Worthen L and Kim CM (2007). The influence of mechanical load on the locomotor pattern in persons with post-stroke hemiparesis. 18<sup>th</sup> Conference of the International Society for Gait and Posture Research. July 2007, Burlington, VT.
  35. Neptune RR, Sasaki K and Kautz SA (2007). Muscle contributions to trunk and leg propulsion with increasing walking speed. 18<sup>th</sup> Conference of the International Society for Gait and Posture Research. July 2007, Burlington, VT.
  36. Behrman AL, Fuller L, Stickles S, Day K, Nair P, Phadke C, Bowden MG, and Kautz SA (2007). Differential effects of robotically- versus manually-assisted locomotor training on stepping performance after incomplete spinal cord injury. 18<sup>th</sup> Conference of the International Society for Gait and Posture Research. July 2007, Burlington, VT.
  37. Bowden MG, Behrman AL and Kautz SA (2007). Joint power response to locomotor training post-stroke: preliminary findings. Innovations in balance and locomotor rehabilitation: the translation from fundamental science to clinical applications. July 2007, Montreal, Quebec, Canada.
  38. Balasubramanian CK and Kautz SA (2007). Step length asymmetry patterns and balance performance in persons with post-stroke hemiparesis. Innovations in balance and locomotor rehabilitation: the translation from fundamental science to clinical applications. July 2007, Montreal, Quebec, Canada.
  39. Day KV, Thigpen MT, Kautz SA and Behrman AL (2007). Quantifying dynamic walking stability in persons with incomplete spinal cord injury. Innovations in balance and locomotor rehabilitation: the translation from fundamental science to clinical applications. July 2007, Montreal, Quebec, Canada. (Was one of two award winners for best graduate student poster presentation)

40. Balasubramanian CK, Bowden MG, Neptune RR and Kautz SA (2007). EMG in stroke subjects with abnormal synergies: implications for walking rehabilitation. APTA Combined Sections Meeting. February 2007, Boston, MA.
41. Peterson CL, Neptune RR and Kautz SA (2007). Walking mechanics limit paretic plantar flexor contributions to propulsion in persons with post-stroke hemiparesis. 24<sup>th</sup> Annual Houston Conference on Biomedical Engineering Research, The Houston Society for Engineering in Medicine and Biology. February 2007, Houston, TX.
42. Plummer P, Behrman AL, Saracino D, Martin J, Fox E, Kautz SA and Duncan PW (2007). Functionally Significant Recovery of Walking Speed after Stroke in Patients with Moderate and Severe Impairment. International Stroke Conference, February 2007, San Francisco, CA.
43. Behrman AL, Bowden MG, Day K, Fuller L, Herget B, Knight R, Nair P, Phadke C and Kautz SA (2006). Differential effects of robotically- versus manually-assisted locomotor training on stepping performance after incomplete spinal cord injury. Robotics in Rehabilitation Symposium, September 2006, Zurich, Switzerland.
44. Bowden MG, Turns LJ, Neptune RR, Balasubramanian CK, Knight R, Peterson C and Kautz SA, (2006). Paretic leg contribution in hemiparetic walking: mechanisms of paretic propulsion. Neural Control of Abnormal Movement, May 2006, Key Biscayne, FL.
45. Balasubramanian CK, Bowden MG, Neptune RR and Kautz SA (2006). Relationship between asymmetrical step lengths and hemiparetic walking performance. Neural Control of Movement annual meeting, May 2006, Key Biscayne, FL.
46. Kautz SA, Bowden MG, Balasubramanian CK and Neptune RR (2006). A new measure of paretic leg contribution in hemiparetic walking. International Stroke Conference, February 2006, Kissimmee, FL.
47. Turns LJ, Peterson CL, Neptune RR and Kautz SA (2006). Paretic leg muscle activity and walking mechanics contribute to asymmetric hemiparetic gait. 23<sup>rd</sup> Annual Houston Conference on Biomedical Engineering Research, The Houston Society for Engineering in Medicine and Biology. February 9-10, Houston, TX.
48. Gregory CM, Bowden M, Kautz S, Vandenborne K. Resistance training and locomotor recovery after incomplete spinal cord injury. American Paraplegia Society-Annual Conference, Las Vegas, NV, 2005.
49. Higginson JS, Zajac FE, Neptune RR, Kautz SA, and Delp SL (2005). Reduced plantarflexor contributions to support in post-stroke hemiparetic gait. Meeting of the International Society of Biomechanics, August 2005, Cleveland, OH.
50. Worthen LC, Kim CM and Kautz SA (2005). Design of a gait laboratory to enable biomechanical analysis of individuals with post-stroke walking deficits: force platform positioning. Meeting of the International Society of Biomechanics, August 2005, Cleveland, OH.
51. Kautz SA, Balasubramanian CK, Bowden MG and Neptune RR (2005). Paretic leg contributions to walking speed in persons with post-stroke hemiparesis. ASME Summer Bioengineering Conference, June 2005, Vail, CO.
52. Higginson JS, Zajac FE, Neptune RR, Kautz SA, and Delp SL (2005). Differences in muscle contributions to support in slow gait. Annual Meeting of the Gait and Clinical Movement Analysis Society, April 2005, Portland, OR.
53. Kautz SA (2004) Coordination of hemiparetic locomotion after post-stroke rehabilitation. ACRM-ASNR Annual Meeting, Ponte Vedra Beach, FL, September 2004.

54. Kautz SA, Patten C; Neptune RR, Worthen L and Kim CM (2003) Bilateral coordination deficits differ with post-stroke motor recovery status. Annual Meeting of the Society for Neuroscience, November 2003, New Orleans, LA.
55. Higginson JS, Zajac FE, Kautz SA, Neptune RR, Delp SL and Burgar CG (2003). Can intrinsic mechanics of equinus result in knee extension?. Annual Meeting of the Gait and Clinical Movement Analysis Society, April 2003, Wilmington, DE.
56. Kautz SA (2003) Bilateral coordination of the lower extremities: Implications for rehabilitation. NASPSPA Annual Meeting, June 2003, Savannah, GA.
57. Kautz SA, Neptune RR, Zajac FE, Worthen L and Dairaghi CA (2002). Muscle function during forward and backward walking. 4<sup>th</sup> World Congress of Biomechanics, August 2002, Calgary, Alberta, Canada.
58. Kautz SA and Neptune RR (2002). Biomechanical determinants of pedaling energetics: internal and external work are not independent. 4<sup>th</sup> World Congress of Biomechanics, August 2002, Calgary, Alberta, Canada.
59. Neptune RR, Kautz SA and Zajac FE (2002). Muscle force not work defines muscle contributions to forward progression. 4<sup>th</sup> World Congress of Biomechanics, August 2002, Calgary, Alberta, CA.
60. Kautz SA (2002). Assessment of lower extremity movement impairment after stroke. International Symposium: Translating Principles Of Brain Plasticity Into Clinical Interventions, Kansas City, Missouri, April 2002.
61. Zajac FE, Neptune RR and Kautz SA (2002). Muscle contributions to trunk forward progression and support in walking. Presented at Proc. 3rd Natl. Mtg. VA Rehabilitation R&D Service (February 2002, Arlington, VA): 119-120.
62. Neptune RR, Kautz SA and Zajac FE (2001). Eccentric muscle activity functions as a brake and an accelerator during normal walking. Annual Meeting of the American Society of Biomechanics, August 2001, San Diego, CA.
63. Chen G, Patten C, Burgar CG, Kautz SA and Zajac FE (2001). Harness-support compliance in treadmill training in post-stroke hemiparesis. Annual Meeting of the American Society of Biomechanics, August 2001, San Diego, CA.
64. Kautz SA, Neptune RR and Zajac FE (2001). Mechanical consequences of controversial individual muscle timing during walking investigated by dynamic simulation. *Gait and Posture*, **13**:273-274. (Annual Meeting of the Gait and Clinical Movement Analysis Society, April 2001, Sacramento, CA)
65. Neptune RR, Kautz SA and Zajac FE (2001). The role of the ankle plantarflexors during normal walking. *Gait & Posture*, **13**:252-253. (Annual Meeting of the Gait and Clinical Movement Analysis Society, April 2001, Sacramento, CA)
66. Chen G, Schwandt D, Van der Loos HFM, Anderson J, Ferris DP, Zajac FE, Kautz SA, Burgar CG, Patten C, Neptune RR and Gordon KE (2001). Compliance-adjustable, force-sensing harness support for studying treadmill training in neurologically impaired subjects. *Gait & Posture*, **13**:293-294. (Annual Meeting of the Gait and Clinical Movement Analysis Society, April 2001, Sacramento, CA)
67. Kautz SA, Patten C, Neptune RR and Harvey J (2000). Interlimb coordination influences on the excitation of paretic leg muscles during lower limb tasks in persons with post-stroke hemiparesis. Annual Meeting of the Society for Neuroscience, October 2000, New Orleans, LA.

68. Zajac FE, Neptune RR and Kautz SA (2000). Individual muscle contributions to forward progression in human walking. Annual Meeting of the Society for Neuroscience, October 2000, New Orleans, LA.
69. Zajac FE, Kautz SA, Ting LH, Neptune RR, Brown DA and Van der Loos HFM (2000). Identification of lower limb motor control strategies. Presented at VA Rehab R&D Conference, February, Washington DC.
70. Neptune RR and Kautz SA (2000). Patellofemoral joint loading in forward versus backward pedaling: implications for rehabilitation strategies. 11th International Conference on Mechanics in Medicine and Biology, April 2000, Maui, Hawaii.
71. Neptune RR, Kautz SA and Zajac FE (1999). Muscle contributions to specific biomechanical functions do not change in forward versus backward pedaling. Proceedings of the VIIIth International Symposium on Computer Simulation in Biomechanics, August 5 - 7, Calgary, Canada, pp. 104-107.
72. Chen G, Kautz SA and Zajac FE (1999). Simulation analysis of muscle activity changes with altered body orientation during pedaling. Proceedings of the VIIIth International Symposium on Computer Simulation in Biomechanics, August 5 - 7, Calgary, Canada, pp. 108-111.
73. Slavin MM, Brown DA, Kautz SA, and Williams KR (1999). Muscle activity phasing during asymmetrical forward and backward pedaling. International Society of Biomechanics; Calgary, Canada, 1999.
74. Ting LH, Kautz SA, Neptune RR and Zajac FE (1999). Functional muscle groups as a basis for neural control of pedaling. *Posture and Gait*, **9(S1)**: S61. (14th Symposium of the International Society for Posture and Gait Research, July 10 - 15, 1999, Waterloo, Canada)
75. Kautz SA, Van der Loos HFM, Brown DA and Zajac FE (1999). The ipsilateral locomotor pattern is strongly influenced by contralateral sensorimotor state. Presented at Annual Meeting of The Society for the Neural Control of Movement, Princeville, Kauai, HI, April, 1999.
76. Slavin MM, Brown DA, Kautz SA and Williams KR (1998) Muscle activity phasing during asymmetrical pedaling in healthy and hemiplegic subjects. Society for Neuroscience; Los Angeles, CA, 1998.
77. Kautz SA and Brown DA (1998). Implications of inappropriate muscle timing for speed of locomotion in hemiplegic persons. *Annals of Biomedical Engineering*, **26(S1)**:S-109. (Presented at Biomedical Engineering Society, Cleveland, Ohio, October, 1998)
78. Kautz SA, Van der Loos HFM, Ting LH, Brown DA and Zajac FE (1998). How much is the ipsilateral locomotor pattern influenced by contralateral sensorimotor state. *Annals of Biomedical Engineering*, **26(S1)**:S-97. (Presented at Biomedical Engineering Society, Cleveland, Ohio, October, 1998).
79. Kautz SA, Brown DA and Dairaghi CA (1998). Increased effort enhances pedaling exercise in persons with poststroke hemiplegia. Presented at VA Rehab R&D Conference, Washington DC, October, 1998.
80. Ting LH, Kautz SA, Brown DA, Van der Loos HFM and Zajac FE (1998). Bilateral integration of sensorimotor signals during pedaling. Presented at Neuronal Mechanisms for Generating Locomotor Activity, New York, NY, March 20-23, 1998.
81. Ting LH, Kautz SA, Brown DA and Zajac FE (1998). Coordination of one leg during flexion phase of human locomotion is altered by the sensorimotor condition of the contralateral leg. Presented at Society for Experimental Biology, York, England, March, 1998.

82. Ting LH, Kautz SA, Brown DA and Zajac FE (1997). Coordination of one leg during flexion phase of human locomotion is altered by the sensorimotor condition of the contralateral leg. Presented at 27th Annual Meeting of the Society for Neuroscience, New Orleans, LA October 26-30, 1997.
83. Neptune RR, Hull ML and Kautz SA (1997). The effect of pedaling rate on coordination in cycling. Presented at XVI International Congress of Biomechanics, Tokyo, Japan, August, 1997; p. 271.
84. Brown DA and Kautz SA (1997). Increased workload enhances force output during pedaling exercise in persons with post-stroke hemiplegia. Presented at Combined Sections Meeting of the APTA, Dallas, TX, February, 1997.
85. Brown DA, Kautz SA and Dairaghi CA (1996). Prolonged muscle activity vs. premature onset during pedaling in persons with post-stroke hemiplegia. Presented at 26th Annual Meeting of the Society for Neuroscience, Washington, DC, November 17-21, 1996.
86. Ting LH, Kautz SA, Brown DA and Zajac FE (1996). Phasing and function of biarticular thigh muscles during backward pedaling. Presented at 26th Annual Meeting of the Society for Neuroscience, Washington, DC November 17-21, 1996.
87. Brown DA, Kautz SA and Dairaghi CA (1995). Effects of increased speed and workload on the control of movement in persons with hemiplegia. Presented at 25th Annual Meeting of the Society for Neuroscience, San Diego, CA, November 11-16, 1995.
88. Kautz SA, Brown DA and Dairaghi CA (1995). Effects of increased exertion during pedaling exercise on kinetic measures of motor performance for hemiplegic persons. Presented at Annual Meeting of the American Society of Biomechanics, Stanford, CA, August 24-26, 1995.
89. Brown DA, Kautz SA and Dairaghi CA (1995): Effects of increased exertion during pedaling exercise in persons with hemiplegia. Presented at American Physical Therapy Association Research Retreat, New Hampton, NH, August 14-18, 1995.
90. Brown DA, Kautz SA and Dairaghi CA (1995): Effects of increased exertion on control of movement in persons with hemiplegia. Presented at Neural Control of Movement Meeting, Key West, FL, April 18-22, 1995.
91. Kautz SA and Brown DA (1994). Interactions between body orientation and motor activity patterns during pedaling. Invited presentation in Motor Control Symposium at Second World Congress of Biomechanics, Amsterdam, The Netherlands, July 10-July 15, 1994.
92. Ting LH, Raasch CC, Sheehan FT, Brown DA, Kautz SA and Zajac FE (1994). Is one leg controlled the same during two mechanically equivalent tasks? Invited presentation in Motor Control Symposium at Second World Congress of Biomechanics, Amsterdam, The Netherlands, July 10-July 15, 1994.
93. Kautz SA and Hull ML (1994). Optimal control based chairing design for cycling. Presented at Second World Congress of Biomechanics, Amsterdam, The Netherlands, July 10-July 15, 1994.
94. Brown DA, Burgar CG, Kautz SA and Dairaghi CA (1993). A method for improving force symmetry during bipedal movement in hemiplegic subjects. Presented at American Academy of Physical Medicine and Rehabilitation, Miami Beach, FL, October 31-November 4, 1993. *Archives of Physical Medicine and Rehabilitation*, 74(11): 1236.
95. Kautz SA and Hull ML (1990). Decomposition of the forces applied to the pedal in cycling. Presented at First World Congress of Biomechanics, San Diego, CA, August 30-September 1, 1990.

96. Kautz SA and Feltner ME (1990). Changes in pedaling dynamics of elite cyclists with increased workload. Presented at First World Congress of Biomechanics, San Diego, CA, August 30-September 1, 1990.
97. Fregley BJ, Kautz SA, Zajac FE and Abraham L (1990). Steady state pedaling of elite cyclists: neuromuscular control strategies based on comparison of experimental and simulation results. Presented at First World Congress of Biomechanics, San Diego, CA, August 30-September 1, 1990.
98. Abraham L, Coyle EF, Kautz SA and Feltner ME (1990). High-power output pedalling of elite cyclists: physiological and biomechanical characteristics. Presented at First World Congress of Biomechanics, San Diego, CA, August 30-September 1, 1990.
99. Kautz SA, Feltner ME, Coyle EF and Baylor AM (1989). Changes in pedaling technique of elite cyclists with increased workload. Presented at XII International Congress of Biomechanics, Los Angeles, CA, June 26-30, 1989.
100. Feltner, M.E., Kautz SA, Coyle EF and Baylor AM (1989). Biomechanical characteristics of propulsive torque generation in two groups of elite cyclists. Presented at XII International Congress of Biomechanics, Los Angeles, CA, June 26-30, 1989.

#### **Alternative Format Scientific Presentations**

1. Kautz SA (2004) "Assessment of Lower Extremity Movement Impairment after Stroke: Compensation versus Restitution"; Module 1: Rehab – Restoring Mobility; Caring for the Older Adult IV, CD-ROM/Internet program; University of Florida Geriatric Education Center, July, 2004.

#### **Non-Published Abstracted Scientific Presentations**

1. Bowden ME and Kautz SA. Clinical and Task-Specific Evaluation of Abnormal Synergy Patterns. Presented at College of Public Health and Health Professions Research Day, Gainesville, FL, April 2008.
2. Fox EJ, Tester NJ, Subramanian S, Kautz SA, Howland DR and Behrman AL. Two Synergies Explain Walking Pattern Recovered in a Child with SCI. Presented at College of Public Health and Health Professions Research Day, Gainesville, FL, April 2008.
3. Clark, DJ, Kautz SA. Fewer basic activation patterns account for lower extremity EMG during walking in adults post-stroke compared to healthy controls. Presented at UF Neuromuscular Plasticity Symposium, Gainesville, FL, January 2008.
4. Bowden ME, Balasubramanian CK, Behrman AL and Kautz SA. Validation of a speed-based classification system using quantitative measures of walking performance post-stroke. Presented at UF Neuromuscular Plasticity Symposium, Gainesville, FL, January 2008.
5. Madhavan S, Bowden ME and Kautz SA. Abnormal interlimb coupling during hemiparetic walking. Presented at UF Neuromuscular Plasticity Symposium, Gainesville, FL, January 2008.
6. Fox EJ, Tester NJ, Kautz SA, Subramanian S, Howland DR and Behrman AL. "It takes two": two muscle synergies account for pattern of walking recovery. Presented at UF Neuromuscular Plasticity Symposium, Gainesville, FL, January 2008.

7. Woodbury ML, Howland D, McGuirk TE, Davis S, Senesac C, Kautz SA, and Richards LG. Effects of trunk restraint combined with intensive task-practice on post-stroke upper extremity reach and function. Presented at UF Neuromuscular Plasticity Symposium, Gainesville, FL, January 2008.
8. Day KV, Gill LC, Stickles SP, Kautz SA, Behrman AL. Measuring recovery of walking stability after incomplete spinal cord injury: comparison of a biomechanical measure and clinical assessments. Presented at UF Neuromuscular Plasticity Symposium, Gainesville, FL, January 2008.
9. Balasubramanian CK, Kautz SA. Swing phase dynamics during hemiparetic walking: Step-to-step variability. Presented at College of Public Health and Health Professions Research Day, Gainesville, FL, April 2007.
10. Bowden MG, Balasubramanian CK, Behrman AL, Kautz SA. Does self-selected walking speed stratify hemiparetic walking ability? Presented at College of Public Health and Health Professions Research Day, Gainesville, FL, April 2007.
11. Day KV, Kautz SA, Behrman AL. Are we more stable walking at slower speeds? Presented at College of Public Health and Health Professions Research Day, Gainesville, FL, April 2007.
12. Balasubramanian CK, Bowden MG, Neptune RR, Kautz SA. Variability during hemiparetic walking. Presented at UF Neuromuscular Plasticity Symposium, Gainesville, FL, November 2006.
13. Bowden MG, Behrman AL, Kautz SA. Mechanisms of response to locomotor training post-stroke: systematic assessment of motor pattern restitution. Presented at UF Neuromuscular Plasticity Symposium, Gainesville, FL, November 2006. (Was Travel Award winner for meritorious poster presentation)
14. Balasubramanian CK, Bowden MG, Kautz SA. Relationship between asymmetrical step lengths and hemiparetic walking performance. Presented at College of Public Health and Health Professions Research Day, Gainesville, FL, April 2006.
15. Nair PM, Kautz SA, Behrman AL. Neuromechanical examination of the control of walking with a posterior leaf spring ankle foot orthosis. Presented at UF Neuromuscular Plasticity Symposium, Gainesville, FL, October 2005.
16. Balasubramanian CK, Bowden MG, Kautz SA. Fast walking speeds: implications for improving functional mobility after stroke. Presented at College of Public Health and Health Professions Research Day, Gainesville, FL, April 2005. (Was Travel Award winner for meritorious poster presentation)
17. Bowden MG, Balasubramanian CK, Kautz SA. Comparison of pedaling and walking force production in post-stroke hemiparesis. Presented at College of Public Health and Health Professions Research Day, Gainesville, FL, March 2005.
18. Balasubramanian CK, Bowden MG and Kautz SA (2004). Relationship between paretic pre-swing and functional walking ability in stroke subjects. Presented at College of Public Health and Health Professions Research Day, Gainesville, FL, April 2004.

19. Higginson JS, Neptune RR, Zajac FE and Kautz SA (2001). How does soleus strength affect gait characteristics? Presented at BCATS 2001 - Biomedical Computation at Stanford, Stanford, CA October 2001.
20. Kautz, SA, Patten C, and Neptune RR (1999) Computer Simulation Analysis of Coordination Deficits in Post-Stroke Hemiplegia. Presented at The Whitaker Foundation Conference, San Diego, CA, August, 1999.

### **Scientific Session Chair**

1. "Altering locomotion through learning and conscious control: what are the implications for rehabilitation?" Neural Control of Movement Annual Meeting, Naples, FL, April 2008.
2. "Human Movement: Modeling and Analysis II". 25<sup>th</sup> Annual Houston Conference on Biomedical Engineering Research, The Houston Society for Engineering in Medicine and Biology. February 2008, Houston, TX.
3. "Neural Mechanisms of Limb Coordination in Locomotion: Insights from Clinical Studies and Development" at Neural Control of Movement Annual Meeting, Key Biscayne, FL, May 2006.
4. "Rehabilitation". Annual Meeting of the Biomedical Engineering Society, Cleveland, OH, October 1998

### **Invited Scientific Presentations: International**

1. "Relationship of normal and abnormal synergies to walking recovery after stroke". Invited seminar at Centre de Recherche Interdisciplinaire en Réadaptation du Montréal Métropolitain, Montréal, Quebec, Canada, February 2009.
2. "Voluntary adaptations to step length during hemiparetic walking", Panelist in "Altering locomotion through learning and conscious control: what are the implications for rehabilitation?" at Neural Control of Movement Annual Meeting, Naples, FL, April 2008.
3. "Bilateral coordination of hemiparetic locomotion", Panelist in "Neural Mechanisms of Limb Coordination in Locomotion: Insights from Clinical Studies and Development" at Neural Control of Movement Annual Meeting, Key Biscayne, FL, May 2006.
4. "Muscle function during forward and backward walking". Invited presentation in Motor Control Symposium at 4<sup>th</sup> World Congress of Biomechanics, August 2002, Calgary, Canada.
5. "Biomechanical determinants of pedaling energetics: internal and external work are not independent". Invited presentation in Sports Sciences Symposium at 4<sup>th</sup> World Congress of Biomechanics, August 2002, Calgary, Canada.
6. "Assessment of lower extremity movement impairment after stroke", Panelist in "Outcome research after stroke" session at "International Symposium: Translating Principles Of Brain Plasticity Into Clinical Interventions", Kansas City, Missouri, April 2002.

7. "Interactions between body orientation and motor activity patterns during pedaling". Invited presentation in Motor Control Symposium at 2<sup>nd</sup> World Congress of Biomechanics, July 1994, Amsterdam, The Netherlands.

#### **Invited Scientific Presentations: National**

1. "Theoretical and experimental analyses of walking in persons with post-stroke hemiparesis", Keynote lecture at 25<sup>th</sup> Annual Houston Conference on Biomedical Engineering Research, The Houston Society for Engineering in Medicine and Biology, February 2008, Houston, TX.
2. "Quantifying Restitution Versus Compensation in Post-stroke Rehabilitation: Implications for Clinical Outcomes", Panelist at Physical Therapy 2006: Annual Conference & Exposition of the American Physical Therapy Association, Orlando, FL, June 2006.
3. Respondent in "Lower Extremity Rehabilitation" session at Functional Restoration for the Stroke Survivor: Informing the Efforts of Engineers State of the Science Workshop, La Jolla, CA, March 2006.
4. "Coordination of hemiparetic locomotion", Keynote lecture at Annual Research Day at Center for Biomedical Engineering Research at University of Delaware, Wilmington, DE, May 2005.
5. "Coordination of hemiparetic locomotion after post-stroke rehabilitation", Panelist in "Locomotor Training Post SCI & Stroke: Bridging Basic Science with Clinical Research and Practice" session at ACRM-ASNR Annual Meeting, Ponte Vedra Beach, FL, September 2004.
6. "Bilateral coordination of the lower extremities: Implications for rehabilitation", Panelist in "Motor Learning/Control Invited Symposium: Stroke Symposium: An Interdisciplinary Approach to Recovery" session at NASPSPA Annual Meeting, Savannah, GA, June 2003.
7. Implications of inappropriate muscle timing for speed of locomotion in hemiplegic persons. Invited presentation at Annual Meeting of the Biomedical Engineering Society, Cleveland, OH, October 1998.

#### **Invited Scientific Presentations: Local**

1. "BRRC Human Motor Performance Lab: High-tech applications to advance the science of rehabilitation for veterans." VA Research Day, Malcom Randall VA Medical Center, Gainesville, FL, June 2006.

#### **Invited Seminars**

1. "Quantitative assessment of walking performance in neurological populations: Theoretical framework and experimental analyses", Rehabilitation Research Seminar, Department of Physical Therapy, University of Florida, Gainesville, FL, January 2005.
2. "How do we provide evidence that therapeutic interventions improve motor recovery? Assessing Changes in Lower Extremity Movement Impairment after Post-Stroke Rehabilitation", University of Florida Retired Faculty Seminar Series, Gainesville, FL, December 2004.

3. "Bilateral coordination of hemiparetic locomotion", BRRC/RORC Research Seminar Series, University of Florida, Gainesville, FL, June 2004.
4. "Assessment of Lower Extremity Movement Impairment after Stroke", Rehabilitation Research Day, University of Florida, Gainesville, FL, May 2004.
5. "Biomechanical Determinants of Human Locomotor Energetics: Lessons from Dynamical Simulations", Department of Exercise Science Seminar, University of Florida, Gainesville, FL, May 2003.
6. "Biomechanical Determinants of Locomotor Energetics: Lessons from Dynamical Simulations", Department of Biomedical Engineering Seminar, University of Florida, Gainesville, FL, January 2003.
7. "Assessment of muscle coordination and movement impairment during hemiparetic locomotion ", Department of Physical Therapy Seminar, University of Florida, Gainesville, FL, May 2002.
8. "Using pedaling to understand muscle coordination during normal and hemiparetic locomotion ", Department of Exercise Science Seminar, University of Texas, Austin, TX, March 2002.
9. "Using pedaling to understand muscle coordination during normal and hemiparetic locomotion ", Department of Exercise Science Seminar, Colorado State University, Fort Collins, CO, January 2002.
10. "Interlimb influences on paretic leg muscle function in post-stroke hemiparesis", Department of Physical Therapy Seminar, Washington University, St Louis, MO, January 2002.
11. "Interlimb influences on paretic leg muscle excitation", Center on Aging Seminar, Kansas University Medical Center, Kansas City, MO, November 2001.
12. "Patellofemoral joint loading in forward versus backward pedaling: implications for rehabilitation strategies", Orthopedics Research Day, VA Palo Alto HCS, Palo Alto, CA, December 2000.
13. "Using pedaling to understand motor control principles for normal and hemiparetic locomotion", Biomechanical Engineering seminar, Stanford University, Stanford, CA, January 1999.
14. "Using pedaling to understand motor control principles for normal and hemiplegic locomotion", Exercise science seminar, University of California, Davis, CA, January 1998:
15. "How can we exploit biomechanical principles to improve endurance cycling performance?", Department of Mechanical Engineering seminar, Stanford University, Stanford, CA, April 1996.
16. "Decomposition of pedal forces in cycling", Biomechanical Engineering seminar, Stanford University, Stanford, CA, January 1993.

## Academic Lectures

1. "Relationship of normal and abnormal synergies to walking recovery after stroke", PHT 6188C, (Biomechanics), University of Florida, Gainesville, FL, February 12, 2009.
2. "Overview of human motor performance lab and biomechanics research", PHT 6188C, (Biomechanics), University of Florida, Gainesville, FL, February 11, 2009.
3. "Restitution versus compensation: Assessing Changes in Lower Extremity Movement Impairment after Post-Stroke Rehabilitation", PHT 6761C, (Neurorehabilitation), University of Florida, Gainesville, FL, November 10, 2008.
4. "Improving rehabilitation of walking in persons with neurological deficits", RSD 6110 (Rehabilitation Science Theory & Application I), University of Florida, Gainesville, FL, October 2, 2008.
5. "Control of body movement", BME 5001, (Introductory Physiology), University of Florida, Gainesville, FL, October 8, 2008.
6. "Theoretical and experimental analyses of walking in persons with post-stroke hemiparesis", RSD 6930, (RSD Seminar), University of Florida, Gainesville, FL, March 31, 2008.
7. "Theoretical and experimental analyses of walking: developing a comprehensive framework for understanding impaired walking and an associated measurement toolbox", PHT 6188C, (Biomechanics), University of Florida, Gainesville, FL, March 5, 2008.
8. "Restitution versus compensation: Assessing Changes in Lower Extremity Movement Impairment after Post-Stroke Rehabilitation", PHT 6761C, (Neurorehabilitation), University of Florida, Gainesville, FL, November 19, 2007.
9. "Control of body movement", BME 5001, (Introductory Physiology), University of Florida, Gainesville, FL, October 15, 2007.
10. "Improving rehabilitation of walking in persons with neurological deficits – A research program", RSD 6110 (Rehabilitation Science Theory & Application I), University of Florida, Gainesville, FL, October 2, 2007.
11. "Control of body movement", BME 5001, (Introductory Physiology), University of Florida, Gainesville, FL, October 16, 2006.
12. "Instrumented treadmills for biomechanical data collection", EML 5598, (Orthopedic Biomechanics), University of Florida, Gainesville, FL, October 9, 2006.
13. "Hemiparetic walking", RSD 6930, (RSD Seminar), University of Florida, Gainesville, FL, April 17, 2006.
14. "Hemiparetic walking", RSD 6930, (RSD Seminar), University of Florida, Gainesville, FL, March 21, 2005.
15. "Quantitative Gait Assessment", PHT 6170 (Applied Biomechanics), University of Florida, Gainesville, FL, January 28, 2005.

16. "Bilateral coordination of hemiparetic locomotion", RSD 6930, (RSD Seminar), University of Florida, Gainesville, FL, March 5, 2004.
17. "Introduction to central pattern generators and their contribution to the control of locomotion (Discussion group leader)", GMS6007, (Fundamental Neuroscience for the 1st yr IDP students), University of Florida, Gainesville, FL, January 29, 2004.
18. "Stroke Rehabilitation: Dynamical Simulations Can Tell Us What Needs to Be Done and Whether We Have Succeeded", EML 5585, (Mechanics of Human Locomotor System), Department of Mechanical and Aeronautical Engineering, University of Florida, Gainesville, FL, September 19, 2003.

### **Academic Classes**

1. PHT 6935, Advanced biomechanics and motor control of locomotion, Fall 2008.
2. PHT 6935, Applying biomechanical insights to motor control questions, Fall 2007.
3. PHT 6935, Advanced biomechanics and motor control of locomotion, Fall 2006.
4. PHT 6935, Applying biomechanical insights to motor control questions, Fall 2005.
5. BME 6938/PHT 6935, Interfacing biomedical engineering and rehabilitation, Spring 2004.

### **PROFESSIONAL HONORS**

University of Florida Research Foundation Professorship (2009-2012) Awarded to tenured faculty who have a distinguished record of research performance in the past five years and evidence of a strong research agenda that is likely to lead to continuing distinction in their field.

Nominee, Gait and Clinical Movement Analysis Society's Best Paper Award (Higginson JS, Zajac FE, Kautz SA, Neptune RR, Delp SL and Burgar CG (2003). Can intrinsic mechanics of equinus result in knee extension?)

Nominee, Gait and Clinical Movement Analysis Society's Best Paper Award (Neptune RR, Kautz SA and Zajac FE (2001). The role of the ankle plantarflexors during normal walking.)

Finalist, Clinical Biomechanics Award, Annual Meeting of the American Society of Biomechanics (Kautz SA, Brown DA, and Dairaghi CA (1995) Effects of increased exertion during pedaling exercise on kinetic measures of motor performance for hemiplegic persons.)

### **STUDENT HONORS**

1. **Raja B** and Kautz SA (2009). Is the non-paretic leg really unaffected after stroke? Presented at College of Public Health and Health Professions Research Day, Gainesville, FL, April 2009. (Was Travel Award winner for meritorious poster presentation).
2. **Balasubramanian CK**, Knight R, Subramanian S, Neptune RR and Kautz SA (2008). Evaluation of the neuromotor mechanisms underlying step length asymmetry patterns during hemiparetic walking using a novel methodology of step-by-step variability in gait data. Neural Control of Movement Annual Meeting. April 2008, Naples, FL. (Won NCM scholarship award to pay for travel to present at meeting).

3. **Bowden MG**, Balasubramanian CK, Behrman AL and Kautz SA (2008). Validation of a speed-based classification system using quantitative measures of walking performance post-stroke. APTA Combined Sections Meeting. February 2008, Nashville, TN. (Won Post-Professional Student Award from the Neurology Section of APTA).
4. **Day KV**, Thigpen MT, Kautz SA and Behrman AL (2007). Quantifying dynamic walking stability in persons with incomplete spinal cord injury. Innovations in balance and locomotor rehabilitation: the translation from fundamental science to clinical applications. July 2007, Montreal, Quebec, Canada. (Won one of two awards for best poster by graduate student).
5. **Bowden MG**, Behrman AL, Kautz SA. Mechanisms of response to locomotor training post-stroke: systematic assessment of motor pattern restitution. Presented at UF Neuromuscular Plasticity Symposium, Gainesville, FL, November 2006. (Was Travel Award winner for meritorious poster presentation)
6. **Balasubramanian CK**, Bowden MG, Kautz SA. Fast walking speeds: implications for improving functional mobility after stroke. Presented at College of Public Health and Health Professions Research Day, Gainesville, FL, April 2005. (Was Travel Award winner for meritorious poster presentation)

### **PROFESSIONAL SERVICE**

Editorial Board member for *Journal of Applied Biomechanics* (2009-present)

Member, External Advisory Board, VA RR&D Maryland Exercise and Robotics Center of Excellence (MERCE), 2009-2011

Abstract Grading Subcommittee, International Stroke Conference, 2009-2010

Co-chair and reviewer for AHA *Bioengineering and Biotechnology 4* study section, April 2009.

*Ad hoc* reviewer for NIH *Musculoskeletal Rehabilitation Sciences* study section, June 2008.

Editorial Board member for *Journal of Rehabilitation Research & Development* (2008-present)

*Ad hoc* reviewer for AHA *Bioengineering and Biotechnology 3* study section, April 2008.

Reviewer (e-mail) of grant application for Research Council of University of Leuven (K.U.Leuven), Belgium, February 2008.

Member, Subcommittee for Clinical Investigation (Subcommittee of Research and Development committee), Malcom Randall VA Medical Center, Gainesville, FL, December (2007-present)

*Ad hoc* reviewer for AHA *Bioengineering and Biotechnology 3* study section, April 2007.

*Ad hoc* reviewer for VA *Stroke* study section, March 2007.

Reviewer (e-mail) of research projects for Health Sciences - Bioengineering and Biomaterials/2006 Panel A for the Science and Technology Foundation, Portugal (FCT), for the Ministry of Science and Technology, January 2007.

Reviewer (e-mail) of research professorship (BOF-ZAP) application for University of Leuven (K.U.Leuven), Belgium, December 2006.

*Ad hoc* reviewer for NIH *Musculoskeletal Rehabilitation Sciences* study section, November 2006.

*Ad hoc* reviewer for VA *Stroke* study section, August 2006.

*Ad hoc* reviewer for AHA *Bioengineering and Biotechnology 2* study section, April 2005.

Invited attendee to national KineAssist Consortium Meeting, Rehabilitation Institute of Chicago, March 2005.

Reviewer of abstracts for International Conference on Rehabilitation Robotics (ICORR 2005).

Reviewer for Special Supplement Issue in Journal of Rehabilitation Research & Development  
Tentative Title: "Rehabilitation Robotics in 2015: A ten-year exercise in futurology"

*Ad hoc* reviewer for NIH *Musculoskeletal Rehabilitation Sciences* study section, March 2004.

Reviewer of abstracts for Annual Meeting of the Gait and Clinical Movement Analysis Society, April 2002.

Member, Organizing Committee of 19th Annual Meeting of the American Society of Biomechanics, Stanford, CA (1994-95).

*Ad hoc* reviewer for: Annals of Biomedical Engineering, Brain, Brain Research, European Journal of Applied Physiology and Occupational Physiology, Experimental Brain Research, Gait & Posture, Journal of the American Gerontological Society, Journal of Applied Biomechanics, Journal of Applied Physiology, Journal of Biomechanics, Journal of Biomechanical Engineering, Journal of Motor Behavior, Journal of Neurological Physical Therapy, Journal of Neurophysiology, Journal of NeuroEngineering and Rehabilitation, Journal of Rehabilitation Research & Development, Medicine and Science in Sports and Exercise, Neurorehabilitation and Neural Repair, Physical Therapy, Research Quarterly, Stroke, IEEE Transactions in Biomedical Engineering

## **PROFESSIONAL SERVICE -- UNIVERSITY**

Chair, Search Committee for Assistant/Associate/Full Professor, Department of Physical Therapy 2009

Proposal Reviewer, College of PPHP submissions to University of Florida Opportunity Fund, November, 2008

Senior faculty moderator, College of Public Health and Health Professions Dean's junior faculty grant writing group (advise and facilitate at biweekly meetings) December 2007 – present.

Proposal Reviewer for internal UF applicants, RFA for collaborative Aging Research sponsored by UF Institute on Aging, November 2007

Mentor, Clinical and Translational Science Institute's Training and Professional Development Program, 2007 – present

Proposal Reviewer for internal UF applicants, Brookdale Leadership in Aging Fellowship Program, September, 2006

Proposal Reviewer, University of Florida Opportunity Fund, March, 2006

Bloodborne pathogen training coordinator, Department of Physical Therapy, 2006-2007

Chair, RSD Committee, Department of Physical Therapy 2005-

Member, Executive Committee of UF Institute on Aging, 2005-

Member, RSD Steering Committee, College of Public Health and Health Professions, 2005-

Chair, Search Committee for three tenure track positions at open rank, Department of Physical Therapy 2002-2003

### **PROFESSIONAL AFFILIATIONS**

Member: American Society of Biomechanics, American Physiological Society, International Society of Biomechanics, Society for Neuroscience, The Society for Neural Control of Movement, American College of Sports Medicine, American Physical Therapy Association (affiliate member)

### **SYMPOSIA AND CONFERENCES**

American College of Sports Medicine 1988

American Congress of Rehabilitation Medicine 2004

American Society of Biomechanics 1988, 1995

American Society of Mechanical Engineers 1991

APTA Research Retreat: Multiple Muscle Systems 1995

APTA Annual Meeting 2006

Deafferentation and the role of Sensory Afferent in Human Motor Control 1993

Innovations in balance and locomotor rehabilitation: the translation from fundamental science to clinical applications 2007

Gait & Clinical Movement Analysis Society 2001

Houston Society of Engineering and Medicine in Biology 2008

International Society of Biomechanics 1989

International Society of Biomechanics – Computer Simulation 1989

International Society for Posture and Gait Research 2007

International Stroke Conference 2006

International Symposium on Neural Regeneration 1997, 2000

International Symposium on the 3-D Analysis of Human Movement 2004

International Symposium: Translating Principles of Brain Plasticity Into Clinical Interventions 2002

North American Society for the Psychology of Sport and Physical Activity 2003

Neural Control of Abnormal Movement 2006

Neural Control of Movement 1995, 1999, 2006, 2008

Neuronal Mechanisms for Generating Locomotor Activity 1998

Shriners Workshop on Human Motion Analysis 1993

Society for Neuroscience 1988, 1993, 1995, 1996, 1997, 2000, 2002, 2003, 2005

World Congress of Biomechanics 1990, 1994, 2002

### **ACADEMIC HONORS**

Distinguished Scholar in Biomedical Engineering (grant for outstanding research potential), University of California, Davis, CA (June 1990)

Recruiting Fellowship, University of California, Davis, CA (October 1989-June 1992)

ARCO Fellowship (for outstanding geophysics graduate student), University of Texas, Austin, TX (September 1984-May 1985)

Industrial Associates Fellowship, University of Texas Institute for Geophysics (January 1984-May 1984)

Member, The Honor's College, Michigan State University (1979-1983)

Member, Phi Kappa Phi National Honor Society

### **Student Mentoring**

#### **Current Students**

1. Bhavana Raja, PhD Candidate (**Committee Chair**, RSD Program, University of Florida, 2006-)
2. Cameron Nott, PhD Candidate (**Committee Chair**, Mechanical and Aeronautical Engineering, University of Florida, 2007-)
3. Kristen Day, PhD Candidate (**Committee Member**, RSD Program, University of Florida, 2007-)
4. Emily Fox, PhD Candidate (**Committee Member**, RSD Program, University of Florida, 2008-)
5. Amit Sethi, PhD Candidate (**Committee Member**, RSD Program, University of Florida, 2008-)
6. Adele Blum, PhD Candidate (**Committee Member**, Neuroscience, University of Florida, 2006-)
7. Sarah Mondello, PhD Candidate (**Committee Member**, Neuroscience, University of Florida, 2008-)
8. Jennifer Jackson, PhD Candidate (**Committee Member**, Biomedical Engineering, University of Florida, 2006-)
9. Jonathan Walter, PhD Candidate (**Committee Member**, Mechanical and Aeronautical Engineering, University of Florida, 2008-)
10. Carrie Peterson, PhD Candidate (**Committee Member**, Mechanical Engineering, University of Texas, Austin, 2007-)

#### **Former Students**

11. Mark Bowden, PhD (**Committee Chair**, RSD Program, University of Florida, 2003-2009)

12. Chitra Lakshmi Balasubramanian, PhD (**Committee Chair**, RSD Program, University of Florida, 2003-2008)
13. Sharon Barak, PhD (**Committee Member**, RSD Program, University of Florida, 2006-2009)
14. Stephanie Jefferson, PhD (**Committee Member**, Neuroscience, University of Florida, 2005-2009)
15. Preeti Nair, PhD (**Committee Member**, RSD Program, University of Florida, 2004-2008)
16. Rick Neptune, PhD (**Committee Member**, Mechanical Engineering, University of California, Davis, 1996)
17. Lena Ting, PhD (**Committee Member**, Mechanical Engineering, Stanford University, 1998)
18. Jill Higginson, PhD (**Committee Member**, Biomedical Engineering, Stanford University, 2004)
19. Nils Hakansson, MS (**Committee Member**, Biomedical Engineering, University of California, Davis, 2003)
20. Claudia Senesac, PhD Candidate (**Committee Member**, RSD Program, University of Florida, 2003)
21. Man-Soo Ko, PhD (**Committee Member**, RSD Program, University of Florida, 2006)
22. Chetan Phadke, PhD (**Committee Member**, RSD Program, University of Florida, 2003-2006)
23. Yi-Po Chiu, PhD Candidate (**Committee Member**, RSD Program, University of Florida, 2003)
24. Jeff Reinbolt, PhD (**Committee Member**, Mechanical and Aeronautical Engineering, University of Florida, 2004-2006)
25. Evan Goldberg, MS (**Committee Member**, Mechanical Engineering, University of Texas, Austin, 2005)
26. Lindsey Turns, MS (**Committee Member**, Mechanical Engineering, University of Texas, Austin, 2005-2006)
27. Carrie Peterson, MS (**Committee Member**, Mechanical Engineering, University of Texas, Austin, 2005-2007)
28. Jeff Rankin, MS (**Committee Member**, Mechanical Engineering, University of Texas, Austin, 2007)
29. Luther GIII, PhD Candidate (**Committee Member**, RSD Program, University of Florida, 2008)
30. Mindy Wellborn, PhD Candidate (**Committee Member**, RSD Program, University of Florida, 2008)