

# Timothy Adam Thrasher, Ph.D.

## *Curriculum Vitae*

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## Education

- Jun 2002      Ph.D. in Medical Sciences – Biomedical Engineering  
University of Alberta, Canada  
Thesis: “A New generation of hybrid orthoses for paraplegic locomotion”
- Sep 1994      B.Sc. (with Honours) in Mechanical Engineering  
University of Alberta, Canada

## Academic employment

- 2013 – present      Associate Chair, Dept. Health & Human Performance, University of Houston, TX
- 2012 – present      Associate Professor, Dept. Health & Human Performance, University of Houston, TX
- 2006 – 2012      Assistant Professor, Dept. Health & Human Performance, University of Houston, TX
- 2002 – 2006      Postdoctoral Fellow, Institute of Biomaterials and Biomedical Engineering, University of Toronto, and Toronto Rehabilitation Institute, Canada
- 2000      Research Consultant, Oxford Orthopedic Engineering Center, University of Oxford, U.K.
- 1996-2000      Teaching Assistant, Dept. Biomedical Engineering, University of Alberta, Canada

## Fellowships, scholarships and awards

- 2002 – 2005      First recipient of the Canadian Paraplegic Association Ontario Spinal Cord Injury Research Fellowship (total \$210,000)
- 1996 – 2000      Alberta Heritage Foundation for Medical Research, Full Studentship
- 1996      Whitaker Student Scientific Paper Competition Award, Rehabilitation Engineering Society of North America, 1996

## Book chapters (peer-reviewed)

1. Popovic MR, **Thrasher TA**. “Neuroprostheses,” In: *Encyclopedia of Biomaterials and Biomedical Engineering* [eds.: Wnek GE, Bowlin GL], Marcel Dekker, New York, July, 2004, pp. 1056-1065.

## Journal publications (peer-reviewed)

1. Mishra RK, Zhou H, Najafi B, **Thrasher TA**. Investigating the effect of transcranial direct current stimulation of dorsolateral prefrontal cortex on motor-cognitive performance in patients with Parkinson’s Disease: A double blind, sham-controlled study. (Submitted to *Neuroscience Letters* Mar 2020).
2. Mishra RK, **Thrasher TA**. Transcranial direct current stimulation of dorsolateral prefrontal cortex improves dual-task gait performance in patients with Parkinson’s Disease: A double blind, sham-controlled study. (Submitted to *Gait & Posture* Apr 2020).
3. Workman CD, **Thrasher TA**. The Influence of Dopaminergic Medication on Nonlinear Analyses of Gait and Balance in Parkinson’s Disease. [January 2020: submitted to *PLOS One*]
4. Workman CD, **Thrasher TA**. The Influence of Dopaminergic Medication on Balance Automaticity in Parkinson’s Disease. *Gait & Posture* 2019; 70:98-103.
5. Workman CD, **Thrasher TA**. The Influence of Dopaminergic Medication on Gait Automaticity in Parkinson’s Disease. *J Clin Neurosci* 2019; 65:71-76.
6. Lee B-C, Fung A, **Thrasher TA**. The effects of coding schemes on vibrotactile biofeedback for dynamic balance training in Parkinson’s Disease and healthy elderly individuals. *IEEE Transactions on Neural Systems & Rehabilitation Engineering*. 2018; 26(1):153-160.
7. Lee B-C, Martin BJ, **Thrasher TA**, Layne CS. The effects of vibrotactile cuing on recovery strategies from a treadmill-induced trip. *IEEE Transactions on Neural Systems & Rehabilitation Engineering*. 2017; 25(3):235-243.
8. **Thrasher TA**, Fisher S. Muscle activation signals during Parkinson’s Disease gait are more rhythmic than normal. *Journal of Neurological Research and Therapy*. 2016; 1(4):20-28.
9. Lee B-C, **Thrasher TA**, Layne CS, Martin BJ. Vibrotactile cuing revisited to reveal a possible challenge to sensorimotor adaptation. *Exp Brain Res*. 2016; 234(12):3523-3530.
10. Workman CD, **Thrasher TA**. Validity and reliability of two reachable workspace protocols using subjects with stroke. *Technol Health Care*. 2016 Mar 4;24(4):513-21.
11. Lee B-C, **Thrasher TA**, Fisher S, Layne CS. The effects of different sensory augmentation on weight-shifting balance exercises in Parkinson’s disease and age-matched healthy elderly individuals. *J Neuroeng Rehabil*. 2015 Sep 2;12:75 (10 pages).
12. **Thrasher TA**, Fisher S. Changes in muscle coordination following Robot-Assisted Gait Training in hemiparetic stroke. *J Novel Physiotherapies* 2014; 4(4):1-3.
13. **Thrasher TA**, Fisher S. Societal Costs of Intrathecal Drug Delivery Systems-An Administrative Analysis Based on Patient Claims. *Neuromodulation* 2013; 16(3):261-265.
14. **Thrasher TA**, Ward JS, Fisher S. Changes in exercise capacity during a 13-week regimen of functional electrical stimulation leg cycling. *NeuroRehabilitation* 2013; 33(1):133-8.

15. Miyatani M, Masani K, Kawashima N, Craven BC, **Thrasher TA**, Popovic MR. Exercise Intensity during Treadmill Walking with Gait Patterned FES among Patients with Incomplete Spinal Cord Injury: Case Series. *ISRN Rehabilitation* 2012, Article ID 251750 (6 pages).
16. Uzun S, Purmoghaddam A, Hieronymus M, **Thrasher TA**. Evaluation of Muscle Fatigue of Wheelchair Basketball Players with Spinal Cord Injury using Recurrence Quantification Analysis of Surface EMG. *Eur J Appl Physiol* 2012; 112(11):3847-3857.
17. Bryant MS, Pourmoghaddam A, **Thrasher TA**. Gait changes with walking devices in persons with Parkinson's Disease. *Disabil Rehabil Assist Technol* 2012; 7(2):149-52.
18. Vette AH, Yoshida T, **Thrasher TA**, Masani K, Popovic MR. A Comprehensive three-dimensional dynamic model of the human head and trunk for estimating lumbar and cervical joint torques and forces from upper body kinematics. *Medical Engineering & Physics* 2012; 34(5):640-649.
19. **Thrasher TA**, Ward JS, Fisher S. Classification of rhythmic locomotor patterns in electromyographic signals using fuzzy sets. *Journal of NeuroEngineering and Rehabilitation* 2011; 8:65.
20. Vette AH, Yoshida T, **Thrasher TA**, Masani K, Popovic MR. A Complete, non-lumped, and verifiable set of upper body segment parameters for three-dimensional dynamic modeling. *Medical Engineering & Physics* 2011; 33(1):70-79.
21. Fisher S, Lucas L, **Thrasher TA**. Robot-assisted gait training for patients with hemiparesis due to stroke. *Topics in Stroke Rehabilitation* 2011; 18(3):269-276.
22. **Thrasher TA**, Sin VW, Masani K, Vette AH, Craven BC, Popovic MR. Kinematic responses of the trunk to multidirectional perturbations during unsupported sitting. *Journal of Applied Biomechanics* 2010; 26(3):332-40.
23. Masani K, Sin VH, Vette AH, **Thrasher TA**, Kawashima N, Morris A, Preuss R, Popovic MR. Postural reactions of the trunk muscles to multidirectional perturbations in sitting. *Clin Biomech* 2009; 24(2):176-82.
24. Miller RC, Popovic MR, **Thrasher TA**, Verrier M. Functional electrical stimulation therapy improves grasping in chronic cervical spinal cord injury: two case studies. *Journal of Automatic Control* 2008; 18(2):53-61.
25. Chi L, Masani K, Miyatani M, **Thrasher TA**, Johnston KW, Mardimae A, Kessler C, Fisher JA, Popovic MR. Cardiovascular Response to Functional Electrical Stimulation and Dynamic Tilt Table Therapy to Improve Orthostatic Tolerance. *J Electromyogr Kinesiol* 2008; 18(6):900-907.
26. **Thrasher TA**, Zivanovic V, McIlroy W, Popovic MR. Rehabilitation of reaching and grasping function in severe hemiplegic patients using Functional Electrical Stimulation Therapy. *Neurorehabil Neural Repair* 2008; 22(6):706-714.
27. **Thrasher TA**, Popovic MR. Functional Electrical Stimulation of walking: Function, exercise and rehabilitation. *Ann Readapt Med Phys* 2008; 51(6):452-60.
28. Márquez C, Popovic MR, **Thrasher TA**, Cameron T, Lozano A, Chen R. Identification of arm movements using correlation of electrocorticographic spectral components and kinematic recordings. *J Neural Eng* 2007; 4:146-158.
29. Steele CM, **Thrasher TA**, Popovic MR. Stimulation approaches to the restoration and rehabilitation of swallowing: A review. *Neurological Research* 2007; 29:9-15.

30. Graham GM, **Thrasher TA**, Popovic MR. The Effect of Random Modulation of Functional Electrical Stimulation Parameters on Muscle Fatigue. *IEEE Transactions on Neural Systems and Rehabilitation Engineering* 2006; 14(1):38-45.
31. Popovic MR, **Thrasher TA**, Adams ME, Takes V, Zivanovic V, Tonack MI. Functional electrical therapy: Retraining grasping in spinal cord injury. *Spinal Cord* 2006; 44(3):143-151.
32. **Thrasher TA**, Flett HM, Popovic MR. Gait training regimen for incomplete spinal cord injury using functional electrical stimulation. *Spinal Cord* 2006; 44(6):357-361.
33. **Thrasher TA**, Graham GM, Popovic MR. Reducing muscle fatigue due to Functional Electrical Stimulation using random modulation of stimulation parameters, *Artificial Organs* 2005; 29(6):453-458.
34. Popovic MR, **Thrasher TA**, Zivanovic V, Takaki J, Hajek V. Neuroprosthesis for retraining reaching and grasping functions in severe hemiplegic patients, *Neuromodulation* 2005; 8(1):58-72.
35. **Thrasher TA**, Popovic MR. Electrical stimulation and neuroprostheses for restoring swallowing function, *Perspectives on Swallowing and Swallowing Disorders (Dysphagia)* June 2004; 13(2):28-31.

## Abstracts & Editorials

1. **Thrasher TA**, Fisher S. Alterations in muscle coordination following Robot-Assisted Gait Training in hemiparetic stroke: A case series. *Neurology* 2014; 82(10):P3.047.
2. **Thrasher TA**, Zivanovic V, McIlroy W, Popovic MR. Functional electrical stimulation therapy compared with conventional OT/PT therapy for the restoration of reaching and grasping function in acute severe hemiplegic patients: A randomized controlled trial. *Stroke* 2013, 44:e221.
3. Ward J, Fisher S, **Thrasher TA**. The muscular endurance and strength benefits of 13 weeks of Functional Electrical Stimulation cycling after spinal cord injury. *International Journal of Exercise Science Abstracts* 2009, 3(1):2.
4. Popovic MR, **Thrasher TA**. How engineers are helping injured people walk again. *Journal of Policy Engagement* 2009, 1(2):16.
5. Boschen K, Hunter J, Hitzig S, Katz J, Craven BC, Rapson L, Walker K, Petrie S, Tonack M, **Thrasher TA**, Popovic MR. Kick-Starting a Spinal Cord Injury Pain Research Program in Ontario: Getting 5 Grants From 1. *Neurorehabil Neural Repair* 2007, 21(6):E7.
6. Popovic MR, **Thrasher TA**, Zivanovic V. Functional electrical therapy: Retraining reaching and grasping functions in severe hemiplegic patients. *Journal of Neurology* 2006, 253(suppl2):P598.
7. **Thrasher TA**, Graham GM, Popovic MR. Attempts to reduce muscle fatigue by randomizing FES parameters. *Artificial Organs* 2004, 28(8):765.
8. **Thrasher TA**, Popovic MR. Neuroprostheses for short-term intervention in incomplete SCI. *Journal of Spinal Cord Medicine* 2004, 27(2):184-185.

## Conference presentations

1. Mishra RK, **Thrasher TA**. The effect of transcranial direct current stimulation of dorsolateral prefrontal cortex on motor-cognitive performance in patients with Parkinson's Disease: A double blind, sham-controlled study, Chicago, IL, October 19-23, 2019.
2. Lee B-C, Martin BJ, **Thrasher TA**, Layne CS. A new fall-inducing technology platform: development and assessment of a programmable split-belt treadmill. *39<sup>th</sup> Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS)*, July 11-15, 2017.
3. Madansingh S, **Thrasher TA**, Layne CS, Lee B-C. Smartphone based fall detection system. *15<sup>th</sup> International Conference on Control, Automation and systems (ICCAS)*, Busan, Korea, October 13-16, 2015.
4. Lee B-C, Fisher S, Layne CS, **Thrasher TA**. Assessment of guidance modality on weight-shifting balance exercises in individuals with Parkinson's Disease. International Society for Posture and Gait Research World Congress, Seville, Spain, June 28 - July 2, 2015.
5. Lee B-C, **Thrasher TA**, Layne CS. The effects of vibrotactile cuing on recovery performance from treadmill-induced trip in healthy young adults. International Society for Posture and Gait Research World Congress, Seville, Spain, June 28 - July 2, 2015.
6. Workman CD, **Thrasher TA**. Validity and reliability of two reachable workspace volume protocols in able-bodied and stroke subjects. ACRM Progress in Rehabilitation Research Annual Conference, Dallas, TX, October 25-30, 2015.
7. Amador R, **Thrasher TA**. The Effects of Reduced Sensation and Altered Proprioception on Rate of Loading. ACRM Progress in Rehabilitation Research Annual Conference, Dallas, TX, October 25-30, 2015.
8. Lee BC, Madansingh S, **Thrasher TA**, Layne CS. The effects of vibrotactile cuing on recovery kinetics after treadmill-induced trip in healthy young adults. Annual Meeting of the Society for Neuroscience. Washington, D.C. November 15-19, 2014.
9. Amador R, **Thrasher TA**. The effects of reduced sensation and altered proprioception on rate of loading. Annual Meeting of the Society for Neuroscience, Washington, DC, November 15-19, 2014.
10. Paulo M, Juarez J, Lee B-C, **Thrasher TA**. Haptic Guidance for Improving Postural Control in Parkinson's Disease. Undergraduate Research Day – University of Houston, Honors College, October 9, 2014.
11. **Thrasher TA**, Fisher S. Alterations in muscle coordination following Robot-Assisted Gait Training in hemiparetic stroke: A case series. Annual Meeting of the American Academy of Neurology, Philadelphia, PA, April 26 – May 3, 2014.
12. **Thrasher TA**, Fisher S. Muscle activation signals during gait are more rhythmic than normal in Parkinson's Disease. Annual Meeting of the Society for Neuroscience, New Orleans, LA, October 14-17, 2012.
13. **Thrasher TA**, Fisher S. Muscle activation signals during gait are more rhythmic than normal in Parkinson's Disease. Movement Disorder Society International Congress of Parkinson's Disease and Movement Disorders, Dublin, Ireland, June 17-21, 2012.
14. **Thrasher TA**, Fisher S. Alterations in muscle coordination following robot-assisted gait training in hemiparetic stroke: A case series. Annual Meeting of the Society for Neuroscience, Washington, DC, November 12-16, 2011.
15. Uzun S, Pourmoghaddam A, Ghabshi HS, Hieronymous M, Layne CS, **Thrasher TA**, Fisher S. Evaluation of muscle fatigue and endurance of wheelchair basketball players with spinal

- cord injury using recurrence quantification analysis of surface EMG. Annual Meeting of the Society for Neuroscience, Washington, DC, November 12-16, 2011.
16. Uzun S, Pourmoghaddam A, Hieronymous M, Mathew S, **Thrasher TA**. Determination of neuromuscular fatigue in basketball players using recurrence quantification analysis of surface EMG. Annual Meeting of the Society for Neuroscience, San Diego, CA, November 13-17, 2010.
  17. Chitlangia P, Fisher S, **Thrasher TA**. Dynamic postural control in Parkinson's Disease during gesture controlled virtual reality. National Center for Human Performance Annual Meeting, Houston, TX, November 4, 2011.
  18. **Thrasher TA**, Fisher S, Ward JS. Representations of Central Patterns in normal and pathological gait: an EMG analysis. Annual Meeting of the Society for Neuroscience, San Diego, CA, November 13-17, 2010.
  19. Ward JS, Qadeer A, Uzun S, Simpson RJ, **Thrasher TA**. The Impact of quadriplegia on immune response to acute arm crank exercise. National Center for Human Performance Annual Meeting, Houston, TX, November 11-12, 2010.
  20. Ward JS, Sharma P, Fisher S, **Thrasher TA**. Identifying Central Patterns of Motor Control in Pathological Gait. Annual Meeting of the Texas Chapter of the American College of Sports Medicine, Houston, TX, March 4-5, 2010. [*Winner: Second Place – Student Poster Competition*]
  21. Ward JS, Fisher S, **Thrasher TA**. The Muscular endurance and strength benefits of 13 weeks of functional electrical stimulation cycling after spinal cord injury. 13<sup>th</sup> Annual Meeting of the North American Neuromodulation Society, Las Vegas, NV, December 3-6, 2009.
  22. Mathew S, Ward JS, Bartlet D, Spielmann G, **Thrasher TA**. Comparison of strength changes in women on and off oral contraceptives relative to the menstrual cycle. National Center for Human Performance Annual Meeting, Houston, TX, November 5-6, 2009. [*Winner: First Place – Student Poster Competition*]
  23. Ward JS, **Thrasher TA**. The Muscular endurance and strength benefits of 13 weeks of functional electrical stimulation cycling after spinal cord injury. National Center for Human Performance Annual Meeting, Houston, TX, November 5-6, 2009.
  24. Deo M, Ivkovic V, Sharma P, LeClair N, Krouskop T, **Thrasher TA**. Reachable workspace in upper limb amputees. National Center for Human Performance Annual Meeting, Houston, TX, November 5-6, 2009.
  25. Pillai A, **Thrasher TA**. Evaluating the Effects of Various Load-Positioning Methods on Gait Stability During the Walk-to-Run Transition. University of Houston, Undergraduate Research Day, Houston, TX, October 1, 2009.
  26. Mathew S, **Thrasher TA**. Comparison of Strength Changes in Females On and Off Oral Contraceptives Relative to the Menstrual Cycle. University of Houston, Undergraduate Research Day, Houston, TX, October 1, 2009.
  27. **Thrasher TA**, Masani K, Popovic MR. Changes in EMG Patterns following Functional Electrical Stimulation Assisted Locomotor Training in Incomplete Spinal Cord Injury. The 38<sup>th</sup> Annual Meeting of the Society for Neuroscience, Washington, D.C., November 15-19, 2008.
  28. Chi L, Masani K, Miyatani M, **Thrasher TA**, Johnston KW, Mardimae A, Kessler C, Fisher JA, Popovic MR. Cardiovascular Effects of FES and Passive Stepping on Orthostatic

- Hypotension. 13<sup>th</sup> Annual Conference of the International FES Society, Freiburg, Germany, September 2008.
29. Zamani N, **Thrasher TA**. Reducing the risk of pressure ulcers in spinal cord injured individuals using neuromuscular electrical stimulation. *8<sup>th</sup> Annual Houston Premedical Academy Research Symposium*, Houston, TX, January 30, 2008. [**Winner: First Place – Student Poster Competition**]
  30. Miyatani M, Kawashima N, Masani K, **Thrasher TA**, Popovic MR. Oxygen uptake during FES treadmill walking: case study. *12th Annual Conference of the International Functional Electrical Stimulation Society*, Philadelphia, PA, November 2007.
  31. Hitzig SL, Boschen K, Hunter JP, Katz J, Craven BC, Tonack M, Rapson L, Petrie S, Walker KD, Ballantyne EC, **Thrasher TA**, Popovic MR. Spinal Cord Injury Pain and Quality of Life Research Initiative. Workshop presented at the *15th Interurban Spinal Cord Injury Conference*, Hamilton, Canada, October 25-26, 2007.
  32. Márquez C, Popovic MR, **Thrasher TA**, Cameron T, Lozano A, Chen R. Identifying movements from electrocorticography. *30th Canadian Medical and Biological Engineering Conference (CMBEC30)*, Toronto, Canada, June 16-19, 2007; p. 265.
  33. Morris A, Popovic MR, Bulsen A-K, **Thrasher TA**. Development of an Automated Trunk Perturbation System. *30th Canadian Medical and Biological Engineering Conference (CMBEC30)*, Toronto, Canada, June 16-19, 2007; p. 269.
  34. Sin V, Masani K, Vette AH, **Thrasher TA**, Morris A, Kawashima N, Popovic MR. Muscle recruitment patterns in perturbed sitting. *30th Canadian Medical and Biological Engineering Conference (CMBEC30)*, Toronto, Canada, June 16-19, 2007; p. 282.
  35. Chi L, **Thrasher TA**, Kessler C, Fisher JA, Popovic MR. Investigation of leg muscle pump activity with FES. *Festival of International Conferences on Caregiving, Disability, Aging and Technology (FICCDAT): Advances in Neurorehabilitation*, Toronto, Canada, June 16-19, 2007; p. 344.
  36. Miyatani M, Kawashima N, **Thrasher TA**, Masani K, Ranjan M, Popovic MR. Oxygen uptake during FES treadmill walking. *Festival of International Conferences on Caregiving, Disability, Aging and Technology (FICCDAT): Advances in Neurorehabilitation*, Toronto, Canada, June 16-19, 2007; pp. 319-320.
  37. Popovic MR, **Thrasher TA**, Zivanovic V. Retraining reaching and grasping functions. *Festival of International Conferences on Caregiving, Disability, Aging and Technology (FICCDAT): Advances in Neurorehabilitation*, Toronto, Canada, June 16-19, 2007; pp. 343-344.
  38. **Thrasher TA**, Masani M, Miyatani M, Popovic MR. Provoking new locomotor patterns using functional electrical stimulation in patients with spinal cord injury. *Proceedings of the 24<sup>th</sup> Annual Houston Conference on Biomedical Engineering Research*, Feb 8-9, 2007.
  39. **Thrasher TA**. Functional Electrical Stimulation-Assisted Walking Therapy, 2<sup>nd</sup> National Spinal Cord Injury Conference, Toronto, Oct 26 – 28, 2006, pp. ???.
  40. Tortolero X, Masani K, **Thrasher TA**, Popovic MR. Instability prediction by monitoring center of pressure during standing, *28th IEEE EMBS Annual International Conference*, New York, Aug 30th – Sep 3rd, 2006, pp. 5412 - 5415.
  41. **Thrasher TA**, Masani K, Popovic MR. Gait training regimen for incomplete spinal cord injury using functional electrical stimulation, *45th Annual Conference of Japanese Society for Medical and Biological Engineering*, Fukuoka, May 15th-17th, 2006.

42. **Thrasher TA**, Flores A, Popovic MR. Muscle synergies for pressure management during prolonged sitting, *Progress in Motor Control V*, State College, Pennsylvania, Aug 17-20, 2005, p. 8-29.
43. **Thrasher TA**, Keller T, Lawrence M, Popovic MR. Effects of isometric FES and dynamic FES on cardiovascular parameters on an active tilt-table stepper, *Proceedings of 10th International Functional Electrical Stimulation Society Conference*, Montreal, Canada, Jul 5-9, 2005, pp. 409-411.
44. Flores A, **Thrasher TA**, Popovic MR. Mechanisms of pressure redistribution during prolonged sitting, *2<sup>nd</sup> Annual Ontario Biomechanics Conference*, Barrie, Canada, Feb 18-20, 2005. [**Winner: NexGen Ergonomics Award**]
45. Graham GM, Popovic MR, **Thrasher TA**. Random Modulation of Functional Electrical Stimulation Parameters, *National Spinal Cord Rehabilitation Conference*, Toronto, Canada, Sep 16-18, 2004, p. 92.
46. Adams ME, Takes V, **Thrasher TA**, Zivanovic V, Bulsen A, Tonack MI, Popovic MR. Functional Electrical Stimulation: A therapeutic tool to restore hand function in patients with spinal cord injury, *National Spinal Cord Rehabilitation Conference*, Toronto, Canada, Sep 16-18, 2004, p. 83.
47. **Thrasher TA**, Graham GM, Popovic MR. Attempts to reduce muscle fatigue by randomizing FES parameters, *Proceedings of 8<sup>th</sup> Vienna International Workshop on Functional Electrical Stimulation*, Vienna, Austria, Sep 10-13, 2004, pp. 80-83.
48. **Thrasher TA**, Graham GM, Popovic MR. Effect of Random Modulation of FES Parameters on Muscle Fatigue, *Proceedings of 9th International Functional Electrical Stimulation Society Conference*, Bournemouth, England, Sept. 6-9, 2004, pp. 366-368.
49. Vanoncini M, **Thrasher TA**, Andrews BJ. Increasing trunk stiffness via FES in paraplegic subjects, *Proceedings of 9th International Functional Electrical Stimulation Society Conference*, Bournemouth, England, September 6-9, 2004, pp. 165-167.
50. **Thrasher TA**, Popovic MR. Neuroprostheses for short term intervention in incomplete SCI, *Annual Scientific Meeting of the American Spinal Injury Association*, Denver, Colorado, USA, May 14-16, 2004.
51. **Thrasher TA**, Popovic MR. Rehabilitation of incomplete spinal cord injury using a neuroprosthesis for walking, *Proceedings of 25<sup>th</sup> Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Cancun, Mexico, September 17-21, 2003, pp. 1566-1568.
52. MacKnight EB, Popovic MR, **Thrasher TA**. Functional electrical therapy for assisted treadmill training: use of passive dynamics, *Proceedings of the 25<sup>th</sup> Annual International Conference the IEEE Engineering in Medicine and Biology Society*, Cancun, Mexico, September 17-21, 2003, pp. 1523-1526.
53. **Thrasher TA** and Popovic MR. FES-assisted walking for rehabilitation of incomplete spinal cord injury, *Proceedings of 8th International Functional Electrical Stimulation Society Conference*, Maroochydore, Australia, July 1-5, 2003, pp. 131-134.
54. MacKnight EB, Popovic MR, **Thrasher TA**. FES-assisted locomotion on an inclined treadmill: Use of passive dynamics, *Proceedings of 8th International Functional Electrical Stimulation Society Conference*, Maroochydore, Australia, July 1-5, 2003, pp. 235-238.



55. **Thrasher TA**, Andrews BJ. Dynamic lateral articulation of the rigid trunk produces foot clearance in MLKAFO gait, *IV World Congress on Biomechanics*, Calgary, Canada, August 4-9, 2002.
56. Andrews BJ, **Thrasher TA**, Chan A, Davoodi R. Trunk momentum can reduce upper limb forces in FES aided paraplegic locomotion, *Proceedings of 5<sup>th</sup> International Functional Electrical Stimulation Society Conference*, Aalborg, Denmark, June 18-21, 2000, pp. 482-485.
57. Andrews BJ, **Thrasher TA**, Chan A, Davoodi R. FES aided paraplegic locomotion: trunk momentum may be used to reduce upper limb forces, *Proceedings of 4<sup>th</sup> International Functional Electrical Stimulation Society Conference*, Sendai, Japan, 1999.
58. Andrews BJ, Cliquet A, Olin M, Burnham R, **Thrasher TA**. Paraplegic locomotion: a linked knee-angle-foot hybrid system, *Proceedings of 3<sup>rd</sup> International Functional Electrical Stimulation Society Conference*, Lucerne, Switzerland, August 20-26, 1998, pp. 165-167.
59. **Thrasher TA**, Andrews BJ, Wang F. Control of FES using reinforcement learning: accelerating the learning rate, *Proceedings of Annual International Conference the IEEE Engineering in Medicine and Biology Society*, vol. 19, 1997.
60. Son WK, Madan S, **Thrasher TA**, Andrews BJ. Fast neural system identification: application to rehabilitation engineering, *Proceedings of IEEE Pacific Rim Conference on Communications, Computers and Signal Processing*, 1997.
61. Wang F, **Thrasher TA**, Ouellette N, Williamson R, Andrews BJ. Machine learning control of FES: real time implementation, *Proceedings of 2<sup>nd</sup> International Functional Electrical Stimulation Society Conference*, Burnaby, Canada, August 16-21, 1997, pp. 75-76.
62. Wang F, **Thrasher TA**, Andrews BJ. Control of FES using unsupervised machine learning, *Proceedings of 2<sup>nd</sup> International Functional Electrical Stimulation Society Conference*, Burnaby, Canada, August 16-21, 1997, pp. 77-78.
63. **Thrasher TA**, Wang F, Andrews BJ. Developing complex FES controllers using a virtual patient, *Proceedings of 2<sup>nd</sup> International Functional Electrical Stimulation Society Conference*, Burnaby, Canada, August 16-21, 1997, pp. 101-102.
64. Andrews BJ, Cliquet A, Olin M, Burnham R, **Thrasher TA**. Paraplegic locomotion: a linked knee-ankle-foot hybrid system, *Proceedings of 2<sup>nd</sup> International Functional Electrical Stimulation Society Conference*, Burnaby, Canada, August 16-21, 1997, pp. 165-167.
65. **Thrasher TA**, Wang F, Andrews BJ. Self-adaptive neuro-fuzzy control of neural prostheses using reinforcement learning, *Proceedings of Annual International Conference the IEEE Engineering in Medicine and Biology Society*, Chicago, USA, vol. 18, 1996.
66. **Thrasher TA**, Wang F, Andrews BJ, Williamson R. Control of neural prostheses III: self adaptive neuro-fuzzy control using reinforcement learning, *Proceedings of Rehabilitation Engineering Society of North America*, Salt Lake City, Utah, USA, June 7-12, 1996, p. 186. [**Winner: Whitaker Student Scientific Paper Competition**]
67. **Thrasher TA**, Andrews BJ. Application of ballistic walking model to FES assisted gait analysis, *Proceedings of the 5<sup>th</sup> Vienna International Workshop on Functional Electrical Stimulation*, Vienna, Austria, 1995.

## Invited lectures and workshops

1. "Immune responses to exercise in Spinal Cord Injury," Invited lecture for Mission Connect (project of the TIRR Foundation) Scientific Meeting, Houston, TX, January 11, 2013.
2. "Colloquium on the development and transfer of technology to assist people with disabilities in Texas," Invited participant, Houston, TX, August 18, 2011.
3. "Functional Electrical Stimulation for Spinal Cord Injury," Invite lecture for HealthSouth Corporation Symposium, The Woodlands, TX, April 30, 2011.
4. "Functional Electrical Stimulation for Motor Recovery in Spinal Cord Injury," Invited lecture for Mission Connect (project of the TIRR Foundation) Scientific Meeting, Houston, TX, November 13, 2009.
5. "Gait Analysis in New Combat Veterans with Back and Knee Pain," Invited lecture at Michael E. DeBakey High School Scientific Symposium, Houston, TX, December 19, 2008.
6. "Provoking new locomotor patterns using Functional Electrical Stimulation in incomplete Spinal Cord Injury," Invited lecture at the 27<sup>th</sup> Congress of the International Society of Electrophysiology and Kinesiology, Niagara Falls, Canada, June 18-21, 2008.
7. "The Biomechanics of Sitting," Invited lecture at Universidad Iberoamericana, Mexico City, Mexico, November 6, 2007.
8. "Recovering function after Spinal Cord Injury," Universidad Iberoamericana, Espacio Biomédico 2007, Jornada de Ingeniería Biomédica, Mexico City, Mexico, November 8, 2007.
9. "Novel Rehabilitation Technology for People with Spinal Cord Injury," Canadian Paraplegic Association Ontario *60<sup>th</sup> Anniversary Celebration*, London, Ontario, Canada – October 18, 2005.
10. "Functional Electrical Therapy: Recovery of Health and Function for Persons with Spinal Cord Injury," Canadian Paraplegic Association Ontario *1<sup>st</sup> Symposium and 60<sup>th</sup> Anniversary Celebration*, Barrie, Ontario, Canada – June 30, 2005.
11. "The Role of Functional Electrical Stimulation Plays in Recovery and Increasing Health and Wellness for Persons with Spinal Cord Injury," Canadian Paraplegic Association Ontario inaugural *Knowledge Mobilization Seminar Series*, Toronto, Canada – May 4, 2005.
12. University of Toronto, Students for Technology and Engineering in Medicine: "Neuroprostheses: Functional and Therapeutic Applications," Toronto, Canada – March 8, 2005.
13. York University, Department of Kinesiology and Health Sciences: "Exercise After Spinal Cord Injury," Toronto, Canada – March 8, 2005.
14. Bloorview MacMillan Children's Centre, Rehabilitation Engineering Department: "Functional Electrical Therapy for Incomplete Spinal Cord Injury," Toronto, Canada – January 18, 2005.
15. Rehabilitation Engineering Research Day, University of Toronto: "Carry-over Effects of Training with Functional Electrical Stimulation," Toronto, Canada – November 26, 2004.
16. "Neuroprostheses for Gait Rehabilitation," *National Spinal Cord Rehabilitation Conference*, Toronto, Canada – September 18, 2004.
17. Chedoke Hospital, Spinal Cord Rehabilitation Centre, Hamilton, Canada – June 21, 2004.
18. Kinesiology and Health Science Student Organization, York University, Toronto, Canada – November 6, 2003.
19. Seminar Series in Faculty of Physical Education and Health, University of Toronto, Toronto, Canada – November 5, 2002.

20. Toronto Rehabilitation Institute “Researchers’ Network” series, Toronto, Canada – September 19, 2002.

## Grant applications in review

1. **Thrasher TA** (PI), York M. Feasibility and Effectiveness of a Wearable Neurostimulation Therapy to Reduce Cognitive-Aging in Individuals with Parkinson’s Disease

## Awarded Grants

1. **Thrasher TA** (PI). “The effects of levodopa and deep brain stimulation on muscle activation patterns during gait in Parkinson's Disease,” Methodist Hospital Research Institute, total: \$34,398 [Funding period: Aug 2014 – Aug 2016]
2. Paloski WH (PI), Layne CS, Clarke MSF, **Thrasher TA**, O’Connor DP, Forth KE, Robertson A. “Modulation of muscle function by lower limb loading during long-duration space flight,” National Aeronautics and Space Administration (NASA), total: \$360,000 [Funding period: Oct 2011 – Sep 2012]
3. **Thrasher TA** (PI), Simpson RJ. “Immune responses to Functional Electrical Stimulation exercise in humans with Spinal Cord Injury” The Institute of Rehabilitation Research (TIRR) Foundation, Mission Connect, total: \$50,000 [Funding period: Mar 2011 – Feb 2012]
4. **Thrasher TA** (PI). Kinematics study of gait and posture in persons with Parkinson’s disease (PD) when walking with different walking devices,” The University of Texas Medical Branch (UTMB), total: \$5,540 [Funding period: May – Aug 2009]
5. **Thrasher TA** (PI), Fisher S. “Balance retraining after sensory deficit using a Virtual Reality intervention,” Institute for Space Systems Operations, total: \$17,030 [Funding period: May – Aug 2009]
6. Krouskop T (PI), **Thrasher TA** (Co-PI). “Rehabilitation Enhancements for Amputee Veterans with Traumatic Brain Injury (TBI),” Health Resources and Services Administration (HSRA), U.S. Dept of Health and Human Services, total: \$165,338 (\$85,550 for UH personnel) [Funding period: Sep 2008 – Aug 2009]
7. **Thrasher TA**. “Reducing the risk of pressure ulcers in spinal cord injured individuals using neuromuscular electrical stimulation,” New Faculty Research Grant, University of Houston, total: \$5,935 [Funding period: May – Sep 2007]
8. Boschen K (PI), Popovic MR, **Thrasher TA**. “Chronic pain and Quality of Life in Spinal Cord Injury,” Canadian Institutes for Health Research (CIHR) – Team Planning and Development Grant, total: \$100,000 [Funding period: Oct 2005 – Sep 2006]
9. Popovic MR (PI), **Thrasher TA**, Craven BC. “Functional Electrical Stimulation-assisted walking: reduction of secondary complications due to spinal cord injury,” Ontario Neurotrauma Foundation (ONF), total: \$150,000 [Funding period: Nov 2004 – Jan 2008]
10. Popovic MR (PI), **Thrasher TA**, Masani K, Craven BC. “Neuroprostheses for sitting function in spinal cord injury,” Canadian Institutes for Health Research (CIHR), total: \$241,445 [Funding period: Sep 2004 – Aug 2007]

## Grant applications not successful

1. **Thrasher TA (PI)**, York M, Kunik M, Lee B-C. “Feasibility and Effectiveness of a Wearable Neurostimulation Therapy to Reduce Cognitive-Aging in Individuals with Parkinson’s Disease,” Source: UH/Baylor College of Medicine Collaborative Pilot Grants (Internal), Total: \$60,000. [Rejected: 2019]
2. Lee B-C (PI), Martin BJ, **Thrasher TA**, Layne CS. “Combining wearable technology and motor control abilities for effective fall prevention in elderly population.” National Institutes of Health (NIH), Total: \$423,449. [Rejected: 2017]
3. **Thrasher TA (PI)**, Lee B-C. “Haptic guidance for postural stability in Parkinson's Disease,” National Institute of Neurological Disorders and Stroke (NINDS), R03 mechanism, total: \$48,815. [Rejected: June 2014]
4. **Thrasher TA (PI)**, Lee B-C. “Haptic guidance for postural stability in Parkinson's Disease,” University of Houston Division of Research, Grants to Enhance and Advance Research (GEAR), total: \$10,000 [Rejected: February 2014]
5. **Thrasher TA (PI)**, Simpson RJ, O’Connor D, Fisher S, Maus E, Berliner JC. “The effects of functional electrical stimulation exercise on wound healing and immune function in spinal cord injury,” NIDRR Field-Initiated Projects, total: \$600,000 [Rejected: Nov 2012]
6. Simpson RJ (PI), **Thrasher TA**, Lowder T, Paloski WH, Maus E, Berliner JC. “The Effects of FES Cycling Exercise Training on Immune and Wound-healing Responses in Patients with Spinal Cord Injury,” National Institute of Child Health and Human Development (NICHD), R03 mechanism, total: \$150,000 [Rejected: Nov 2011]
7. Frieden L (PI), **Thrasher TA**. “National Public Health Practice and Information Center on Paralysis,” U.S. Dept. of Health and Human Services, Centers for Disease Control and Prevention (CDC), total: \$774,000 (UH portion) [Rejected: June 2011]
8. Simpson RJ (PI), **Thrasher TA**, Thomas Lowder, William Paloski. “The Effects of FES Cycling Exercise Training on Immune and Wound-healing Responses in Patients with Spinal Cord Injury,” National Institute of Child Health and Human Development (NICHD), R03 mechanism, total: \$150,000 [Rejected: March 24, 2011]
9. **Thrasher TA (PI)**, Fisher S, Robertson A. “Development of a Virtual Reality-based Balance Training Program for Patients with Parkinson's Disease,” National Institute of Neurological Disorders and Stroke (NINDS), 1 R03 NS075814-01, total: \$150,000 [Rejected: February 13, 2011]
10. Helmer D (PI), **Thrasher TA**. “Role of Gait Analysis in OEF/OIF Veterans with Chronic Back & Knee Pain,” Veterans Health Administration, Rehabilitation R&D Service, 1 I01 RX000122-01, total: \$113,900 [Rejected: April 6, 2009]
11. **Thrasher TA (PI)**, McFarlin BK. “Muscle reconditioning after Spinal Cord Injury using FES hybrid exercise,” Craig H. Neilsen Foundation, Pre-clinical and Clinical Grants program, total: \$249,999 [Rejected: April 16, 2009]
12. **Thrasher TA (PI)**, Fisher S. “Kinematic biofeedback versus center of pressure biofeedback in interventions for older adults with postural instability,” National Institute on Aging, NIH Challenge Grant in Health and Science Research, total: \$959,386 [Rejected: July 30, 2009]

## Student Advising

### Present

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Jun 2020 – present	Vivian Rose, Ph.D. Candidacy Committee, University of Houston
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Jan 2018 – present Dongyual Yoo, Ph.D. Candidacy Committee, University of Houston  
 Jan 2018 – present David Temple, Ph.D. Dissertation Committee, University of Houston  
 Jan 2017 – present David Young, Ph.D. Candidacy Committee, University of Houston  
 Aug 2016 – present Nishant Rao, Ph.D. Dissertation Committee, University of Houston  
 (co-advising with Dr. P. Parikh)

**Past (University of Houston)**

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Jan 2017 – May 2020 Lauren Gulley, Ph.D. Candidacy Committee, University of Houston  
 Aug 2014 – May 2020 Ram Kinker Mishra, Ph.D. Kinesiology, University of Houston  
 Aug 2011 – 2018 Craig Workman, Ph.D. Kinesiology, University of Houston  
 Jan 2017 – 2018 Rakshatha Kabbaligere, Ph.D. Dissertation Committee, University of Houston  
 Jan 2011 – 2018 Raul Amador, M.S. Kinesiology, University of Houston  
 Aug 2015 – Jan 2017 Alberto Fung, Ph.D. Kinesiology, University of Houston (co-advising with Dr. B-C Lee)  
 Feb 2016 – Aug 2017 Rahul Goel, Ph.D. Kinesiology, University of Houston (co-advising with Dr. P. Parikh)  
 Jan 2014 – Dec 2016 Amber Chelette, Ph.D. Ph.D. Kinesiology (dissertation committee member)  
 Jan 2016 – present Brigitta Hohl, B.S. Kinesiology  
 May 2014 – Dec 2015 Mariana Paolo, B.S. Kinesiology  
 Aug 2010 – Dec 2013 Amruta Dongre, M.S. Kinesiology  
 May 2012 – Dec 2012 Donovan Schrieber, B.S. Kinesiology [**Winner: Summer Undergraduate Research Fellowship 2013**]  
 May 2012 – Dec 2012 Karyn Schwab, B.S. Kinesiology [**Winner: Provost's Undergraduate Research Scholarship 2012**]  
 Jan 2012 – Aug 2012 Karim Sadiwala, B.S. Kinesiology [**Winner: Provost's Undergraduate Research Scholarship 2012**]  
 Aug 2011 – Dec 2011 Jisha John, B.S. Kinesiology [**Winner: Provost's Undergraduate Research Scholarship 2011**]  
 May 2010 – Dec 2012 Prerana Chitlangia, M.S. Kinesiology  
 May 2009 – May 2010 Srinivas Pushpala, B.Sc. Biology (Undergraduate Honors thesis)  
 May 2008 – May 2009 Shobha Mathew, B.Sc. Biomedical Engineering [**Winner: Provost's Undergraduate Research Scholarship 2009**]  
 May 2009 – Aug 2009 Anish Pillai, B.Sc. Biology [**Winner: Summer Undergraduate Research Fellowship 2009**]  
 Aug 2008 – Dec 2008 Hannan Elquza, B.Sc. Biology [**Winner: Provost's Undergraduate Research Scholarship 2008**]  
 Aug 2007 – Dec 2007 Japan Bhalja, B.Sc. Kinesiology [**Winner: Provost's Undergraduate Research Scholarship 2007**]  
 May 2007 – Aug 2007 Nader Zamani, B.Sc. Biology [**Winner: Alliance for Graduate Education and the Professoriate (AGEP) Summer 2007 Research Program**]

- May 2007 – Aug 2007 Syed Javed, B.Sc. Electrical Engineering [**Winner: Summer Undergraduate Research Fellowship 2007**]
- Jan 2007 – Apr 2007 Oreoluwa Koyejo, B.Sc. Kinesiology [**Winner: Provost's Undergraduate Research Scholarship 2007**]

### **Past (University of Toronto)**

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- Sep 2004 – Sep 2008 Albert Vette, Ph.D. Biomedical Engineering
- Sep 2004 – Sep 2006 Vivian Sin, M.A.Sc. Biomedical Engineering
- Sep 2005 – Apr 2006 Lorne Chi, B.Sc. Engineering Science thesis
- Sep 2005 – Apr 2006 Robert Nguyen, B.Sc. Engineering Science thesis
- Sep 2004 – Apr 2005 Virginia Chu, B.Sc. Engineering Science thesis
- Sep 2004 – Apr 2005 Matthew Cousens, B.Sc. Engineering Science thesis
- Jun 2004 – Feb 2005 Alejandra Flores, B.Sc. Biomedical Engineering thesis, Universidad Iberoamerica, Mexico [**Winner: NexGen Ergonomics Award**]
- May 2003 – Apr 2004 Geoffrey Graham, M.A.Sc. Mechanical Engineering
- Sep 2003 – Apr 2004 Jeremy Cohen, B.Sc. Engineering Science thesis
- Sep 2003 – Apr 2004 Nancy Agbaje, B.Sc. Kinesiology/Psychology thesis, York University
- Sep 2002 – Apr 2003 Charmaine Gonsalvas, B.Sc. Engineering Science thesis

### **Reviewed Grant Applications**

- U.S. Department of Health and Human Services – *National Institute on Disability and Rehabilitation Research (NIDRR)* Rehabilitation Engineering Research Center (RERC) Grant Review – 2018
- U.S. Department of Health and Human Services – *National Institute on Disability and Rehabilitation Research (NIDRR)* Switzer Fellowships Program Grant Review – 2017
- U.S. Department of Health and Human Services – *National Institute on Disability and Rehabilitation Research (NIDRR)* Small Business Innovation Research (SBIR) Grant Review – 2017
- National Science Foundation and U.S. Department of Health and Human Services – *National Institute on Disability, Independent Living, and Rehabilitation Research (NIDRR)* Disability and Rehabilitation Research Project (DRRP) Health and Function of Individuals with Disabilities, Scientific Review Panel – 2015
- U.S. Department of Education – *National Institute on Disability and Rehabilitation Research (NIDRR)* Disability and Rehabilitation Research Project (DRRP) Grant Review – 2014
- National Science Foundation (NSF) – Scientific Review Panel – 2014
- U.S. Department of Education – *National Institute on Disability and Rehabilitation Research (NIDRR)* Spinal Cord Injury Model Systems Priority 2 Grant Review – 2012
- U.S. Department of Education – *National Institute on Disability and Rehabilitation Research (NIDRR)* Switzer Fellowships Program Grant Review – 2009, 2010
- *Northern Ireland Chest Heart and Stroke Association (NICHSA)* Scientific research grants for research into chest disease and stroke illness – 2008

- U.S. Department of Education – *National Institute on Disability and Rehabilitation Research (NIDRR) Rehabilitation Engineering Research Centers Program (RERC) on Spinal Cord Injury* – 2007
- *Canadian Institutes of Health Research (CIHR) and Sick Kids Foundation* – New Investigator Grants Program – 2006
- *Health Research Board (HRB) in Dublin, Ireland* – Research Fellowships for Therapy Professions – 2006

## **Reviewed Manuscripts for Peer-reviewed Journals**

- *PLOS One*
- *Neuroscience Letters*
- *RATE Journal*
- *Neurorehabilitation & Neural Repair*
- *Journal of Spinal Cord Medicine*
- *Journal of Spine & Neurosurgery*
- *Physiotherapy Theory and Practice*
- *IEEE Trans on Control System Technology*
- *Gait & Posture*
- *Medical Science Monitor*
- *Journal of Sports Science and Medicine*
- *Experimental Neurology*
- *IEEE Sensors Journal*
- *Medical Engineering & Physics*
- *Journal of Neurophysiology*