

Curriculum Vitae:
Ronald J. Triolo, Ph.D.
ronald.triolo@case.edu

CURRENT POSITIONS:

- January 2005 – Present Director, Center for Advanced Platform Technology (APT)
A National Center in Rehabilitation Engineering
US Department of Veterans Affairs
10701 East Blvd.
Cleveland, OH 44106
(216) 791-3800 ext. 4138 (voice)
(216) 231-3433 (facsimile)
- July 2017 – Present Tenured Full Professor
Department of Biomedical Engineering
Case Western Reserve University
Secondary Appointment: Department of Orthopaedics
- July 2009 – June 2017 Tenured Full Professor
Department of Orthopaedics
Case Western Reserve University
Secondary Appointment: Department of Biomedical Engineering
- July 2002 – June 2009 Associate Professor (with Tenure)
Department of Orthopaedics
Case Western Reserve University
Secondary Appointment: Department of Biomedical Engineering
- August 1994 – June 2002 Assistant Professor (Tenure Track)
Department of Orthopaedics
Case Western Reserve University
11100 Euclid Avenue
Cleveland OH 44106
- October 2007 – Present Senior Research Career Scientist
Rehabilitation R&D Service
US Department of Veterans Affairs
- October 2002 – 2007 Research Career Scientist
Rehabilitation R&D Service
US Department of Veterans Affairs
- November 1999 – Present Director, Motion Study Laboratory
Louis Stokes Cleveland of Veterans Affairs Medical Center
(LSCVAMC)
- November 1997 – Present Bioscientific Staff
Department of Orthopaedics
MetroHealth Medical Center
Cleveland, OH 44109-1998

EDUCATION:

Ph.D. Biomedical Engineering 1986, Drexel University, Philadelphia PA
M.S. Electrical Engineering 1985, Drexel University, Philadelphia PA
M.S. Biomedical Engineering 1983, Drexel University, Philadelphia PA
B.S. Electrical Engineering 1980, Villanova University, Villanova PA

HONORS AND AWARDS:

Paul B. Magnuson Award, US Department of Veterans Affairs, 2019.
Fellow, American Institute for Medical and Biological Engineering (AIMBE) 2014–present
Senior Research Career Scientist Awardee, US Department of Veterans Affairs, 2007–present
Research Career Scientist Awardee, US Department of Veterans Affairs, 2002–2007
Maurice Saltzman Award for Clinical/Academic Excellence, Mount Sinai Foundation, 2004

Academic Editor, PLOS ONE, 2016–2018
Editorial Board, *Journal of Rehabilitation Research and Development*, 1999 – 2016
Associate Editor, *IEEE Transactions on Neural Systems & Rehabilitation Engineering*, 1999 – 2010
Assistant Editor, *IEEE Transactions on Rehabilitation Engineering*, 1993 – 1999
Professional Achievement Award, Villanova University, 1992
Selected to Sigma Xi, Scientific Research Society, 1984
Calhoun Fellow, Drexel University, 1981–1983
Presidential Scholar, University of Pennsylvania, 1980
Rhode's Scholarship Candidate
Summa Cum Laude Graduate, Villanova University, 1980
Who's Who in American Colleges and Universities, 1980
Dean's Award for Academic Excellence, Villanova University, 1980
Dean's Award for Meritorious Service, Villanova University, 1980
Outstanding Engineer Award, Villanova University, 1978–1980
Presidential Scholar, Villanova University, 1976–1980

RESEARCH AND RELEVANT PROFESSIONAL EXPERIENCE:

October, 1995 – September, 1996
Director of Research, Health Hill Hospital for Children
2801 Martin Luther King Jr. Drive, Cleveland, OH
Developed independent research program in pediatric neurological rehabilitation focusing on children with central cord syndrome and spastic athetosis, cerebral palsy. Facilitated research proposal design from staff physicians, psychologists and physical/occupational therapists. Coordinated activity and administration of the Institutional Review Board. Responsible for educational programs on research design and clinical uses of functional electrical stimulation.

August, 1986 – August, 1994
Director of Research, Philadelphia Unit of Shriners Hospitals
Clinical Assistant Professor, Department of Orthopaedic Surgery
Temple University, Philadelphia PA

Responsible for conducting research in the application of functional neuromuscular stimulation to children with spinal cord injuries or cerebral palsy. Implemented and evaluated systems to control standing and walking with stimulation in children with paraplegia (or spastic diplegia), and to provide active grasp and release in children with tetraplegia (or spastic quadriplegia). Organized and coordinated interdisciplinary team of engineers and therapists to assess the physiological effects of stimulation and functional outcomes of upper and lower extremity systems. Supervised graduate students in Biomedical Engineering or Physical Therapy from local universities.

October, 1983 – August, 1986

Biomedical Engineer

Veterans Administration Medical Center

Philadelphia, PA

Responsible for the design, software realization and engineering evaluation of digital myoelectric signal processors. Developed a digital controller for an actively powered, volitional above-knee prosthesis.

September, 1981 – 1986

Biomedical Engineer and Research Assistant

Gait Analysis Laboratory

Moss Rehabilitation Hospital, Philadelphia, PA

Conceived and executed research investigating the nature of electromyographic signals and their application to prosthetic control. Successfully demonstrated several techniques to detect the direction and estimate the magnitude of motions of the lower extremity.

PROFESSIONAL SOCIETY MEMBERSHIPS:

AAAS: American Academy for the Advancement of Science

AIMBE: American Institute of Medical & Biological Engineering

ASIA: American Spinal Injury Association

BMES: Biomedical Engineering Society

EMBS: Engineering in Medicine and Biology Society

IEEE: Institute of Electrical and Electronic Engineers

IFESS: International Functional Electrical Stimulation Society (Board Member 2002–2005)

Tau Beta Pi: Engineering Honor Society

Eta Kappa Nu: Electrical Engineering Honor Society

Phi Kappa Phi: National Honor Society

Sigma Xi: Scientific Research Society

PUBLICATIONS:

Peer Reviewed Papers Submitted and Currently in Review

1. “Walking after incomplete spinal cord injury with an implanted neuromuscular electrical stimulation system and a hinged knee replacement: a single-subject study,” N. Makowski, L. Lombardo, K. Foglyano, R. Kobetic, G. Pinault, S. Selkirk, **R. Triolo**, *Spinal Cord Series and Cases* – submitted May 2020.

2. "Effect of context-dependent modulation of trunk muscle activity on manual wheelchair propulsion," S. Bailey, K. Foglyano, N. Bean, **R. Triolo**, *Spinal Cord Series and Cases* – submitted March 2020.
3. "A closed-loop self-righting controller for seated balance in the coronal and diagonal planes following spinal cord injury," A. Bheemreddy, L.M. Lombardo, M.E. Miller, K.M. Foglyano, S. Nogan-Bailey, **R.J. Triolo**, M.L. Audu, *Medical Engineering & Physics* – submitted March 2020.
4. "Characterization of force production capabilities of paralyzed trunk muscles activated with functional neuromuscular stimulation," A.R.W. Friederich, M.L. Audu, **R.J. Triolo**, *IEEE Transaction on Biomedical Engineering* – submitted March 2020.
5. "Sudden stop detection and automatic seating support with neural stimulation during manual wheelchair propulsion," K. Foglyano, L. Lombardo, J. Schnellenger, **R. Triolo**, *Journal of Spinal Cord Medicine* – submitted February 2020.

Peer-Reviewed Papers (Published or Accepted for Publication: Total = 146)

1. "Ambulatory searching task reveals importance of somatosensation for lower-limb amputees," B.P. Christie, H. Charkhkar, C.E. Shell, C.J. Burant, D.J. Tyler, **R.J. Triolo**, *Scientific Reports* – in press, May 2020.
2. "Chronic nerve health following implantation of femoral nerve cuff electrodes," M. Freeberg, G. Pinault, D. Tyler, **R. Triolo**, R. Ansari, *Journal of NeuroEngineering and Rehabilitation* – in press, March 2020.
3. "Sum of phase-shifted sinusoids stimulation prolongs paralyzed muscle output," K. Gelenitis, M. Freeberg, **R. Triolo**, *Journal of NeuroEngineering and Rehabilitation*, 17: 49 (2020). DOI: 10.1186/s12984-020-00679-1
4. "Sensory neuroprosthesis improves postural stability during Sensory Organization Test in lower-limb amputees," H. Charkhkar, B. Christie, **R. Triolo**, *Scientific Reports* 10: 6984 (2020) DOI: 10.1038/s41598-020-63936.
5. "Oxygen consumption while walking with multi-joint neuromuscular electrical stimulation after stroke: a case report," N. Makowski, R. Kobetic, K. Foglyano, L. Lombardo, S. Selkirk, G. Pinault, **R. Triolo**, *American Journal of Physical Medicine & Rehabilitation* DOI:10.1097/phm.0000000000001416, PMID: 32149817, March 2020.
6. "Implanted high-density cuff electrodes functionally activate human tibial and peroneal motor units without chronic detriment to peripheral nerve health," C. Delianides, D. Tyler, G. Pinault, R. Ansari, **R. Triolo**, *Neuromodulation* DOI: 10.1111/ner.13110, March 2020.
7. "Estimating total maximum isometric force output of trunk and hip muscles after spinal cord injury", A. Bheemreddy, A. Friederich, L. Lombardo, **R. Triolo**, M. Audu, *Medical & Biological Engineering & Computing* 58: 739-751 (2020).
8. "Intraoperative responses may predict chronic performance of composite flat interface nerve electrodes on human femoral nerves," M.J. Freeberg, R. Ansari, G.C.J. Pinault, L.M. Lombardo, M.E. Miller, D.J. Tyler, **R.J. Triolo**, *IEEE Transactions on Neural Systems & Rehabilitation* 27(12):2317-2327, PMID: 31689196, PMCID: PMC6938031, DOI: 10.1109/TNSRE.2019.2951079.
9. "A translational framework for peripheral nerve stimulating electrodes: Reviewing the journey from concept to clinic," H. Charkhkar, B. Christie, G. Pinault, D. Tyler, **R. Triolo**, *Journal of Neuroscience Methods* 328(1): 2019, 108414.

10. "Selective nerve cuff stimulation strategies for prolonging muscle output," K. Gelenitis, B. Sanner, **R. Triolo**, D. Tyler, *IEEE Transactions on Biomedical Engineering*, DOI: 10.1109/TBME.2019.2937061, Early Access, August 2019.
11. "Visual inputs and postural expectations affect the location of somatosensory percepts elicited by electrical stimulation," B. Christie, H. Charkhkar, C. Shell, P. Marasco, D. Tyler, **R. Triolo**, *Scientific Reports* (9), Article 11699, 2019.
12. "Visual tactile synchrony of stimulation-induced sensation and natural somatosensation," B. Christie, E. Graczyk, H. Charkhkar, D. Tyler, **R. Triolo**, *Journal of Neural Engineering* 16(3) 2019
13. "Experimental implementation of automatic control of posture-dependent stimulation in an implanted standing neuroprosthesis," B.M. Odle, L.M. Lombardo, M.L. Audu, **R.J. Triolo**, *Applied Bionics and Biomechanics*, <https://doi.org/10.1155/2019/2639271>.vol. 2019, Article ID 2639271.
14. "High density peripheral nerve cuffs restore natural sensation to individuals with lower limb amputations," H. Charkhkar, C. Shell, P. Marasco, G. Pinault, D. Tyler, **R. Triolo**, *Journal of Neural Engineering* 15, 2018 PMID: 29855427, DOI: 10.1088/1741-2552/aac964
15. "Automatic application of neural stimulation during wheelchair propulsion after SCI enhances recovery of upright sitting from destabilizing events," K. Armstrong, L. Lombardo, K. Foglyano, M. Audu, **R. Triolo**, *Journal of NeuroEngineering and Rehabilitation*. (2018) 15:17 DOI 10.1186/s12984-0362-2.
16. "Cycle training using implanted neural prosthesis: Team Cleveland," J. McDaniel, L. Lombardo, K. Foglyano, P. Marasco, **R. Triolo**, *European Journal of Translational Myology*, 27(4):289-294, 2018.
17. "Comparison of strategies and performance of functional electrical stimulation cycling in spinal cord injured pilots for competition in the first ever CYBATHLON," C. Azevedo Coste, V. Bergeron, R. Berkelmans, E.F Martins, C. Fornusek, A. Jesada, K.J. Hunt, R. Tong, **R Triolo**, P. Wolf, *European Journal of Translational Myology*, 27(4):251-254, 2018.
18. "Long-term technical and clinical performance and user satisfaction of implanted neuroprostheses for upright mobility after paralysis: Two to 14-year follow-up." **R.J. Triolo**, S.N. Bailey, K. Foglyano, R. Kobetic, L. Lombardo, M. Miller, S. Selkirk, G. Pinault, *Archives of Physical Medicine & Rehabilitation*, 99:289-298, 2018.
19. "Setting the pace: Insights and advancements gained while preparing for an FES bike race," J. McDaniel, P. Marasco, L. Lombardo, **R. Triolo**, *Journal of Neural Engineering and Rehabilitation*, (2017) 14:118, DOI 10.1186/s12984-017-0326-y.
20. "Effect of exoskeletal joint constraints and passive resistance on metabolic energy expenditure: implications for walking in paraplegia," S. Chang, R. Kobetic, **R.J. Triolo**, *Public Library of Science (PLOS)* 12(8), e0183125, August 17 2017
21. "The design of and chronic tissue response to the composite flat interface nerve electrode (C-FINE)," M. Freeberg, M. Stone, D. Tyler, **R. Triolo**, *Journal of NeuroEngineering* 2017 Apr 6;14(3):036022
22. "Control of standing balance at leaning postures with functional neuromuscular stimulation following spinal cord injury," M.L. Audu, B. Odle, **R. Triolo**. *Medical & Biological Engineering & Computing* 56:317-330, 2018 DOI 10.1007/s11517-017-1687-x
23. "Restoring standing capabilities with feedback control of functional neuromuscular stimulation following spinal cord injury," R. Nataraj, M.L. Audu, **R.J. Triolo**, *Medical Engineering and Physics* (2017) 42: 13-25 <https://doi.org/10.1016/medengphy.2017.01.23>

24. "Long-term stability of stimulating spiral nerve cuff electrodes on human peripheral nerves," B. Christie, M. Freeberg, W. Memberg, G. Pinault, H. Hoyen, D. Tyler, **R. Triolo**, *Journal of NeuroEngineering and Rehabilitation*, (2017), 14:70. DOI 10.1186/s1284-017-0285-3.
25. "Impact of an implanted neuroprosthesis on community ambulation in incomplete SCI," L.M. Lombardo, R. Kobetic, G. Pinault, K.M. Foglyano, S.N. Bailey, S. Selkirk, **R.J. Triolo**, *Journal of Spinal Cord Medicine*, (2017) ISSN: 1079-0245-7723, DOI 10.1080/10790268.216.1275448.
26. "Reactive stepping with functional neuromuscular stimulation in response to forward directed perturbations," A. Hunt, B. Odle, L. Lombardo, M. Audu, **R. Triolo**, *Medical & Biological Engineering & Computing*, (2017), 14:54 DOI 10.1186/s12984-017-026606
27. "A muscle-driven approach to restore stepping with an exoskeleton for individuals with paraplegia," SR Chang, MJ Nandor, L Li, R Kobetic KM Foglyano, JR Schnellenberger, ML Audu, G Pinault, RD Quinn, **RJ Triolo**, *Journal of Neural Engineering and Rehabilitation*, (2017) 14:48, DOI 10.1186/s12984-017-0258-6
28. "Detecting destabilizing wheelchair conditions for maintaining seated posture," A. Crawford, M. Audu, **R. Triolo**, *Disability and Rehabilitation: Assistive Technology* 2017, DOI: 101080/17483107.2017.130347.
29. "Accelerometer-based step initiation control for gait assist neuroprostheses," K. Foglyano, J.R. Schnellenberger, R. Kobetic, L. Lombardo, G. Pinault, S. Selkirk, N. Makowski, **R.J. Triolo**, *Journal of Rehabilitation Research & Development* 23(6):919-922, 2016.
30. "Improving stand-to-sit maneuver for individuals with spinal cord injury by controlling the knee with a hybrid neuroprosthesis," S.R. Chang, M.J. Nandor, R. Kobetic, K. Foglyano, R.D. Quinn, **R.J. Triolo**, *Journal of NeuroEngineering and Rehabilitation* 13(27), 2016. PMC4793745
31. "Feasibility of restoring walking in multiple sclerosis with multichannel implanted electrical stimulation," S. Selkirk, R. Kobetic, L. Lombardo, G. Pinault, **R. Triolo**, *American Journal of Physical Medicine & Rehabilitation*, 95(12):880-888, December 2016. PMID: 28151761 DOI: 10.1097/PHM.0000000000000692
32. "Improving walking with an implanted neuroprosthesis for hip, knee and ankle control after stroke," N.S. Makowski, R. Kobetic, L. Lombardo, K. Foglyano, G. Pinault, S. Selkirk, **R. Triolo**, *American Journal of Physical Medicine & Rehabilitation* 95(12): 880-888, 2016. PMC5115927
33. "Simulating the restoration of standing balance at leaning postures with functional neuromuscular stimulation following spinal cord injury," R. Nataraj, M. Audu, **R. Triolo**, *Medical & Biological Engineering & Computing*, 2016 Jan;54(1):163-76. doi: 10.1007/s11517-015-1377-5. Epub 2015 Sep 1. PMID: 26324246, PMCID: PMC4775462.
34. "Review of powered lower-limb exoskeletons to restore gait for individuals with paraplegia," S.R. Chang, R. Kobetic, M.S. Audu, R. Quinn, **R.J. Triolo**, *Case Journal of Orthopaedics* 12(1): 75-80, 2016.
35. "Intrinsic and extrinsic contributions to seated balance in the sagittal and coronal planes: implications for trunk control after spinal cord injury," M.L. Audu, **R. Triolo**, *Journal of Applied Biomechanics* 31(4): 221-228, August 2015. PMC4939827
36. "Feasibility of a hydraulic power assist system for use in a hybrid neuroprosthesis," K. Foglyano, R. Kobetic, C. To, T. Bulea, J. Schnellenberger, M. Audu, M. Nandor, R. Quinn, **R. Triolo**, *Applied Bionics and Biomechanics* 2015:1-8, ID 205104, DOI: 10.1155/2015/205104. PMC4745429

37. "A neuroprosthesis for control of seated balance after spinal cord injury," M.L. Audu, L. Lombardo, J. Schnellenger, K. Foglyano, M. Miller, **R. Triolo**, *Journal of Neural Engineering and Rehabilitation* 12:8 DOI: 10.1186/1743-0003-12-8, 2015.
38. "A comparison of myoelectric control and cyclic control of an implanted neuroprosthesis to modulate gait speed in incomplete spinal cord injury," L. Lombardo, S. Bailey, K. Foglyano, M. Miller, G. Pinault, **R. Triolo**, *Journal of Spinal Cord Medicine* 38(1):115-122, 2015. PMC4293526
39. "Understanding stand-to-sit maneuver: implications for motor neuroprostheses after paralysis," S. Chang, R. Kobetic, **R. Triolo**, *Journal of Rehabilitation Research and Development* 51(9): 1339-1352, 2014. DOI: 10.1682/JRRD.2013.12.0264. 2014. PMC2578673
40. "Modified Newton-Raphson method to tune feedback gains of control systems for standing by functional neuromuscular stimulation following spinal cord injury," R. Nataraj, M. Audu, **R. Triolo**, *Applied Bionics and Biomechanics*, 11(4):169-174, 2014, PMCID: PMC4326073, DOI: 10.3233/ABB-140104.
41. "Forward stair descent with a hybrid neuroprosthesis after paralysis: a single case study demonstrating feasibility," T.C. Bulea, R. Kobetic, M.S. Audu, J.R. Schnellenger, G. Pinault, **R.J. Triolo**, *Journal of Rehabilitation Research and Development* 51(7): 1077-1094, 2014. PMC4667789
42. "Selective activation of the human tibial and common peroneal nerves with a flat interface nerve electrode," M.A. Schiefer, M. Freeberg, G.C. Pinault, J. Anderson, H. Hoyen, D.J. Tyler, **R.J. Triolo**, *Journal of Neural Engineering* 10(5): 056006, 1-13, 2013 PMID: 23918148, PMCID: PMC3809099
43. "Stance controlled knee flexion improves stimulation driven walking after spinal cord injury," T.C. Bulea, R. Kobetic, M.L. Audu, J.R. Schnellenger, G. Pinault, **R.J. Triolo**, *Journal of NeuroEngineering and Rehabilitation* 10(68): 68, 2013. DOI: 10.1186/1743-0003-10-68, PMID: 23826711, PMCID: PMC3708761
44. "Feasibility of a closed-loop controller for righting seated posture after spinal cord injury," J. Murphy, M. Audu, L. Lombardo, K. Foglyano, **R. Triolo**, *Journal of Rehabilitation Research and Development*, 51(5):747-60, 2014. PMID25333890
45. "Posture dependent control of stimulation in a standing neuroprosthesis: a simulation feasibility study," M. Audu, S. Gartman, R. Nataraj, **R. Triolo**, *Journal of Rehabilitation Research and Development* 51(3):481-496, 2014. PMID25019699
46. "Sensor-based hip control with a hybrid neuroprosthesis for walking in paraplegia," C. To, R. Kobetic, T.C. Bulea, M.L. Audu, J. Schnellenger, G. Pinault, **R. Triolo**, *Journal of Rehabilitation Research and Development*, 51(2):229-244, 2014.
47. "Effects of trunk stimulation on manual wheelchair propulsion mechanics after spinal cord injury," **R.J. Triolo**, L.M. Lombardo, S. Nogan-Bailey, M. Miller, K. Foglyano, M.L. Audu, *Archives of Physical Medicine & Rehabilitation* 94(10):1997-2005, 2013 DOI:10.1016/j.apmr. 2013.04.010, PMID: 23628377, PMC4103696.
48. "Optimization of selective stimulation parameters for multi-contact electrodes," L. Fisher, D. Tyler, **R. Triolo**, *Journal of NeuroEngineering and Rehabilitation* 10:25, 2013. DOI: 10.1186/1743-0003-10-25, PMID: 23442372, PMCID: PMC3599334
49. "Effects of stimulating hip and trunk muscles on seated stability, posture and reach after spinal cord injury," **R. Triolo**, L. Lombardo, M. Miller, S. Nogan-Bailey, M. Audu, *Archives*

- of Physical Medicine & Rehabilitation* 94(9):1766-75, 2013. DOI: 10.1016/j.apmr.2013.02.023, PMID: 23500182, PMC4103650, NIHMS603555.
50. "The effects of combined trunk and gluteal neuromuscular electrical stimulation on posture and tissue health in spinal cord injury," G.A. Wu, L. Lombardo, **R. Triolo**, KM Bogie, *Physical Medicine & Rehabilitation Journal* 5(8): 688-696, 2013. DOI: 10.1016/j.pmrj.2013.03.025, PMID: 23542776
 51. "A convertible spinal orthosis for controlled torso rigidity," N. Kern, **R.J. Triolo**, R. Kobetic, M. Audu, R.D. Quinn, *Applied Bionics and Biomechanics*, 10(1):57-73, 2013. DOI 10.3233/ABB-2012-0069
 52. "Finite state control of a variable impedance hybrid neuroprosthesis for locomotion after paralysis," T.C. Bulea, R. Kobetic, M.L. Audu, J.R. Schnellenger, **R.J. Triolo**, *IEEE Transactions on Neural Systems and Rehabilitation Engineering* 21(1):141-151, 2013. DOI: 10.1109/TNSRE.2012.2227124, PMID: 23193320, PMC3830532
 53. "Design and experimental evaluation of a vertical lift walker for sit-to-stand transition assistance," T. Bulea, **R. Triolo**. *ASME Journal of Medical Devices* 6(0145041):1-5, March 2012. PMID: 23904904, PMCID: PMC3707190
 54. "Center of mass acceleration feedback control of standing balance by functional neuromuscular stimulation against external perturbations," R. Nataraj, M. Audu, **R.J. Triolo**, *IEEE Transactions on Biomedical Engineering*, 16(1):10-19, 2013 DOI:10.1109/TBME.2012.2218601, Epub 2012 Sept 12. PMID: 22987499, PMCID: PMC3578290
 55. "A variable impedance knee mechanism for controlled stance flexion during pathological gait," T.C. Bulea, R. Kobetic, C.S. To, M. Audu, J. Schnellenger, **R.J. Triolo**, *IEEE Transactions on Mechatronics* 17(5):822-832, 2012. DOI: 10.1109/TMECH.2011.2131148
 56. "Center of mass acceleration feedback control of functional neuromuscular stimulation for standing in presence of internal postural perturbations," R. Nataraj, M. Audu, **R. Triolo**, *Journal of Rehabilitation Research & Development* 49(6): 889-912, 2012. DOI: 10.1109/TBME.2012.2218601, PMID23299260, PMC3573353
 57. "Sensor-based stance control with orthosis and functional neuromuscular stimulation for walking after spinal cord injury," C. To, R. Kobetic, T.C. Bulea, M.L. Audu, J.R. Schnellenger, G. Pinault, **R.J. Triolo**, *Journal of Prosthetics and Orthotics*, 24(3):124-132, 2012. DOI: 10.1097/JPO.0b013e3182627a13 PMID24933721
 58. "Comparing joint kinematics and center of mass acceleration for feedback control of standing by functional neuromuscular stimulation," R. Nataraj, M. Audu, **R. Triolo**, *Journal of NeuroEngineering and Rehabilitation*, 9:25, 2012. DOI:10.1186/1743-0003-9-25, PMID: 22559852, PMCID: PMC3484032
 59. "An exploratory study of perceived quality of life with implanted standing neuroprostheses," L. Rohde, B. Bonder, **R. Triolo**. *Journal of Rehabilitation Research & Development* 49(2):265-278, 2012. PMID: 22773528 PMC4465790
 60. "Longitudinal performance of a surgically implanted neuroprosthesis for lower extremity exercise, standing, and transfers after spinal cord injury," **R.J. Triolo**, S.N. Bailey, M.E. Miller, L. Rohde, J. Anderson, J.A. Davis, J.J. Abbas, L.A. DiPonio, G.P. Forrest, D.R. Gater, L.J. Yang, *Archives of Physical Medicine and Rehabilitation*. 93(5):896-904, 2012. DOI: 10.1016/j.apmr.2012.01.001, PMID: 22541312, PMC4111081
 61. "Center of mass acceleration feedback control for standing by functional neuromuscular stimulation – a simulation study," R. Nataraj, M. Audu, R. Kirsch, **R. Triolo**, *Journal of*

- Rehabilitation Research & Development* 49(2): 279-296,2012. PMID: 22773529, PMCID: PMC3586940
62. "Trunk acceleration for neuroprosthetic control of standing – a pilot study," R. Nataraj, M. Audu, R. Kirsch, **R. Triolo**, *Journal of Applied Biomechanics* 28(1): 85-92, 2012, PMID: 21975251, PMCID: PMC3577928
 63. "Human distal sciatic nerve fascicular anatomy: implications for ankle control utilizing nerve cuff electrodes," K. Gustafson, Y. Grinberg, S. Joseph, **R. Triolo**. *Journal of Rehabilitation Research & Development*. 49(2):309-322, 2012. PMID: 22773531
 64. "Probabilistic modeling of selective stimulation of the human sciatic nerve with a flat interface nerve electrode," M. Schiefer, **R. Triolo**, D. Tyler, *Journal of Computational Neuroscience*33(1): 179-190, 2012 DOI: 10.1007/s10827-011-0381-5, PMID: 2222951, PMCID: PMC3357453
 65. "An objective method for selecting command sources for myoelectrically controlled lower extremity neuroprostheses," A. Dutta, R. Kobetic, **R. Triolo**, *Journal of Rehabilitation Research and Development*. 48(8): 935-948, 2011. PMID: 22068372
 66. "Stance control knee mechanism for lower extremity support in a hybrid neuroprosthesis," C.S. To, R. Kobetic, T. Bulea, M. Audu, J. Schnellenberger, Pinault G, **R.J. Triolo**, *Journal of Rehabilitation Research and Development*. 48(7):839-850, 2011. PMID: 21938668
 67. "Posture shifting after spinal cord injury using functional neuromuscular stimulation – a computer simulation study," M. Audu, R. Nataraj, S. Gartman, **R. Triolo**. *Journal of Biomechanics*. 44(9): 1639-1645, 2011. DOI: 10.1016/j.jbiomech.2010.12.020, PMID: 21536290, PMCID: PMC3617559
 68. "Comprehensive joint-feedback control for standing by functional neuromuscular stimulation – a simulation study," R. Nataraj, M. Audu, R. Kirsch, **R. Triolo**. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*. 18(6): 646-657, 2010. DOI: 10.1109/TNSRE.2010.2083693, PMID: 20923741, PMCID: PMC3570823
 69. "Gait evaluation of a novel hip constraint orthosis with implication for walking in paraplegia," M.L. Audu, C. To, R. Kobetic, **R. Triolo**. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*. 18(6): 610-618, 2010. DOI: 10.1109/TNSRE.2010.2047594, PMID: 20378478
 70. "Neuroprosthetic and neurotherapeutic effects of implanted electrical stimulation for ambulation after incomplete spinal cord injury." S.N. Bailey, E. Hardin, R. Kobetic, L. Boggs, G. Pinault, **R. Triolo**, *Journal of Rehabilitation Research & Development*47(1): 7-16, 2010. DOI:10.1682/JRRD.2009.03.0034
 71. "Selective stimulation of the common human femoral nerve with a flat interface nerve electrode," M.A. Schiefer, K.H. Polasek, **R.J. Triolo**, G.C. Pinault, and D.J. Tyler, *Journal of Neural Engineering*, 7(2010): 1-9; 026006, 2010. DOI: 10.1088/1741-2560/7/2/026006, PMID: 20208125, PMCID: PMC2915830
 72. "Intraoperative evaluation of the spiral nerve cuff electrode on the femoral nerve trunk." K.H. Polasek, M.A. Schiefer, G.C.J. Pinault, **R.J. Triolo**, D.J. Tyler, *Journal of Neural Engineering*6 (2009) 066005 (6pp). DOI: 10.1088/1741-2560/6/6/066005, PMID: 19901448, PMCID: PMC2927973
 73. "Fascicular anatomy of the human femoral nerve: implications for standing neural prostheses utilizing nerve cuff electrodes," Gustafson KJ, Pinault GCJ, Neville J, Syed I, Davis JA, Jean-Claude J, **Triolo RJ**. *Journal of Rehabilitation Research & Development*, 46(7):973-984, 2009. PMID: 20104420, PMCID: PMC2967182

74. "A musculoskeletal model of the trunk and hips for the development of a seated posture-control neuroprosthesis," J. Lambrecht, M. Audu, **R. Triolo**, R. Kirsch, *Journal of Rehabilitation Research & Development* 46(4): 5:15-528, 2009. PMID: 19882486, PMCID: PMC3594999
75. "Biomechanical analysis of surface electrical stimulation on the trunk musculature during wheelchair propulsion," Y. Yang, A. Koontz, **R. Triolo**, J. Mercer, S. Fitzgerald, R. Cooper, M. Boninger, *Neurorehabilitation and Neural Repair*23(7):717-25, 2009. (Epub 2009 Mar 4). DOI: 10.1177/1545968308331145, PMID: 19261768
76. "Development of a hybrid orthosis for standing, walking and stair climbing after spinal cord injury," R. Kobetic, C. To, J. Schnellenberger, M. Audu, T. Bulea, R. Gaudio, S. Tashman, **R.J. Triolo**, *Journal of Rehabilitation Research & Development* 46(3):447-462, 2009. PMID: 19675995
77. "Chronic stability and selectivity of four-contact spiral nerve-cuff electrodes in stimulating the human femoral nerve," L.E. Fisher, D.J. Tyler, J.S. Anderson, **R.J. Triolo**, *Journal of Neural Engineering* 6(2009) 046010. DOI: 10.1088/1741-2560/6/4/046010, PMID: 19602729, PMCID: PMC2928075
78. "Implanted electrical stimulation of the trunk for seated postural stability and functional mobility after cervical SCI: A single case study," **R.J. Triolo**, L. Boggs, M. Miller, J. Nagy, G. Nemunaitis, S. Nogan-Bailey, *Archives of Physical Medicine & Rehabilitation* 90(2): 340-347, 2009. DOI: 10.1016/j.apmr.2008.07.029, PMID: 19236990, PMCID: PMC2648134
79. "Gait initiation with electromyographically triggered electrical stimulation in people with partial paralysis," A. Dutta, R. Kobetic, **R. Triolo**, *ASME Journal of Biomechanical Engineering* 131(8); 081002: 1 – 9, 2009. DOI: 10.1115/1.3086356, PMID: 19604014
80. "A locking compliant device inspired by the anatomy of the spine," N.I. Kern, T.J. Majewski, R. Kobetic, **R.J. Triolo**, R.D. Quinn, *ASME Journal of Mechanical Design* 131(1): 14501-1 – 3, 2009. DOI: 10.1115/1.2991143
81. "Selection of an optimal muscle set for a 16-channel standing FES system," S. Gartman, M. L. Audu, R. F. Kirsch, **R.J. Triolo**. *Journal of Rehabilitation Research & Development* 45(7): 1007-1017, 2008. PMID: 19165690
82. "Standing after spinal cord injury with four contact nerve-cuff electrodes for quadriceps stimulation," L. Fisher, M. Miller, S. Nogan, J. Davis, J. Anderson, L. Murray, D. Tyler, **R. Triolo**, *IEEE Transactions on Neural Systems and Rehabilitation Engineering* 16(5):473-478, 2008. DOI: 10.1109/TNSRE.2008.2003390, PMID: 18990650, PMCID: PMC2936226
83. "Design of a variable constraint hip mechanism for a hybrid neuroprosthesis to restore gait after spinal cord injury," C. To, R. Kobetic, J. Schnellenberger, M. Audu, **R. Triolo**, *IEEE/ASME Transactions on Mechatronics*, 13(2):197-205, 2008. DOI: 10.1109/TMECH.2008.918551
84. "A model of selective activation of the femoral nerve with a flat interface nerve electrode for a lower extremity neuroprosthesis," M. Schiefer, **R. Triolo**, D. Tyler, *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, 16(2): 195-204, 2008 (front cover). DOI: 10.1109/TNSRE.2008.918425, PMID: 18403289, PMCID: PMC2920206
85. "Ambulation after incomplete spinal cord injury with EMG-triggered functional electrical stimulation," A. Dutta, R. Kobetic, **R. Triolo**, *IEEE Transactions on Biomedical Engineering* 55(2): 791-794, 2008. PMID: 17946304

86. "Energy cost of the Case Western Reserve standing neuroprosthesis," G.P. Forrest, T.C. Smith, **R.J. Triolo**, J.P. Gagnon, D. DiRisio, M.E. Miller, L. Murray, J.A. Davis, A. Iqbal, *Archives of Physical Medicine & Rehabilitation* 88(8):1074-1076, 2007. PMID: 17678672
87. "New functional neuromuscular stimulation approaches to standing and walking," V.K. Mushahwar, P.L. Jacobs, R.A. Normann, **R.J. Triolo**, N. Kleitman, *Journal of Neural Engineering* 4(2007) S181-S197 - JNE/244402/SPE/114677. PMID: 17873417
88. "Walking after incomplete spinal cord injury with an implanted FES system: a case report," E. Hardin, R. Kobetic, L. Murray, M. Corado-Ahmed, G. Pinault, J. Sakai, S.N. Bailey, C. Ho, **R. Triolo**, *Journal of Rehabilitation Research and Development* 44(3):333-346, 2007. PMID: 18247230
89. "Experimental verification of a computational technique for determining ground reactions in human bipedal stance," M. Audu, R. Kirsch, **R.J. Triolo**. *Journal of Biomechanics* 40:1115-1124, 2007. PMID: 16797023
90. "Controlling seated posture and balance with electrical stimulation of the paralyzed trunk," **R.J. Triolo**, *Case Orthopaedic Journal* 3(1):90-98, 2006.
91. "Surface electromyography activity of trunk muscles during wheelchair propulsion," Y. Yang, A. Koontz, **R. Triolo**, J. Mercer, M. Boninger. *Clinical Biomechanics* 21(10): 1032-1041, 2006. PMID: 16979271
92. "A model-based study of passive joint properties on muscle effort during stance," K. Amankwah, **R.J. Triolo**, R. Kirsch, M. Audu, *Journal of Biomechanics* 39: 2253-2263, 2006. PMID: 16157347
93. "Feasibility of a neuroprosthesis for the control of seated posture after spinal cord injury with functional electrical stimulation: A simulation study," A.J. Wilkenfeld, M.L. Audu, **R.J. Triolo**. *Journal of Rehabilitation Research & Development* 43(2):139-152, 2006. PMID: 16847781
94. "Selection of an optimal muscle set for a standing neuroprosthesis using a human musculoskeletal model", B. Heilman, R. Kirsch, M. Audu, **R.J. Triolo**. *Journal of Rehabilitation Research & Development* 43(2):273-286, 2006. PMID: 19165690
95. "Long term prevention of pressure ulcers in high-risk individuals: a case study of the use of gluteal neuromuscular electrical stimulation," K. Bogie, X. Wang, **R.J. Triolo**. *Archives of Physical Medicine & Rehabilitation* 87:585-591, 2006. PMID: 16571402
96. "Interventions for mobility and manipulation after spinal cord injury: a review of orthotic and neuroprosthetic options," J. Knutson, M. Audu, **R. Triolo**. *Topics in Spinal Cord Rehabilitation* 11(4):61-81, 2006. DOI: 10.1310/9UU4-KL3V-CPL2-Q7VF
97. "Simulation of a functional neuromuscular stimulation powered mechanical gait orthosis with coordinated joint locking," C.S. To, R.F. Kirsch, R. Kobetic, **R.J. Triolo**. *IEEE Transactions on Neural Systems and Rehabilitation Engineering* 13(2):227-235, 2005. PMID: 16003904
98. "Clinical applications of electrical stimulation after spinal cord injury." G.H. Creasey, C.H. Ho, **R.J. Triolo**, D.R. Gater, A.F. DiMarco, K.M. Bogie, M.W. Keith. *Journal of Spinal Cord Medicine* 27(4): 365-375, 2004. PMID: 15484667
99. "Development of a new assessment of effort and assistance in standing pivot transfers with FES." C. Bieri, L. Rohde G.S. Danford, E. Steinfeld, S. Snyder, **R.J. Triolo**. *Journal of Spinal Cord Medicine* 27:226-235, 2004. PMID: 15478525

100. "The effects of trunk stimulation on bimanual seated workspace." S. Kukke, **R.J. Triolo**, *IEEE Transactions on Neural Systems and Rehabilitation Engineering* 12(2): 177-185, 2004. PMID: 15218932
101. "Performance of epimysial stimulating electrodes in the lower extremities of individuals with spinal cord injury." J. Uhler, **R.J. Triolo**, J.A. Davis, C. Bieri. *IEEE Transactions on Neural Systems and Rehabilitation Engineering* 12(2): 279-287, 2004. PMID: 15218941
102. "The effects of spinal cord injury on lower limb passive joint moments revealed through a non-linear viscoelastic model." K. Amankwah, **R.J. Triolo**, R. Kirsch, *Journal of Rehabilitation Research & Development* 41(1): 15-32, 2004. PMID: 15273894
103. "Implanted neuroprostheses for standing and transfers after spinal cord injury." **R.J. Triolo**, J.A. Davis, *Case Orthopaedic Journal*, 1(1): 44-50, 2004.
104. "The effects of regular use of neuromuscular electrical stimulation on tissue health." K. Bogie, **R.J. Triolo**. *Journal of Rehabilitation Research & Development* 40(6):469-476, 2003. PMID: 15077659
105. "A computational technique for determining the ground reaction forces in human bipedal stance." M.L. Audu, R.F. Kirsch, **R.J. Triolo**. *Journal of Applied Biomechanics* 19:361-371, 2003
106. "Development of a hybrid gait orthosis: a case report." R. Kobetic, E.B. Marsolais, D. Davy, R. Gaudio, **R. Triolo**. *Journal of Spinal Cord Medicine* 26(3): 254-258, 2003. PMID: 14997968
107. "Long term user perceptions of an implanted neuroprosthesis for exercise, standing and transfers after spinal cord injury." S. Agarwal, **R.J. Triolo**, R. Kobetic, M. Miller, C. Bieri, S. Kukke, L. Rohde, J.A. Davis. *Journal of Rehabilitation Research & Development* 40(3): 214-234, 2003. PMID: 14582528
108. "Consumer perspectives on mobility: implications for neuroprosthesis design," D.L. Brown-Triolo, M.J. Roach, **R.J. Triolo**, K Nelson. *Journal of Rehabilitation Research & Development* 39(6): 659-669, 2002.
109. "Preliminary performance of a surgically implanted neuroprosthesis for standing and transfers" J.A. Davis, **R.J. Triolo**, J.P. Uhler, C. Bieri, L. Rohde, D. Lissy. *Journal of Rehabilitation Research & Development* 38(6): 609-617, 2001. PMID: 11767968
110. "Introduction to the single topic issue on functional electrical stimulation." **R. J. Triolo**, *Journal of Rehabilitation Research & Development* 38(6): vi-ix, 2001. PMID: 1176797
111. "Effects of active hip extension moment and posture on upper extremity support forces during FNS-induced standing." **R.J. Triolo**, M.A. Wibowo, J.P. Uhler, R. Kobetic, R.F. Kirsch. *Journal of Rehabilitation Research & Development* 38(5): 545-555, 2001. PMID: 11732832
112. "Selectivity of intramuscular stimulating electrodes in the lower limbs." **R.J. Triolo**, M.Q. Liu, R. Kobetic, J.P. Uhler. *Journal of Rehabilitation Research & Development* 38(5): 533-544, 2001. PMID: 11732831
113. "A reusable, self-adhesive electrode for intra-operative stimulation in the lower limbs." **R.J. Triolo**, J.D. Moss, N. Bhadra. - *Journal of Rehabilitation Research & Development* 38(5): 527-532, 2001. PMID: 11732830
114. "Preface to the special millennium paper issue on functional electrical stimulation," **R. Triolo**, R. Kirsch. *Neuromodulation* 4(4):139-141, 2001. DOI: 10.1046/j.1525-1403.2001.00139.x

115. "Modeling the postural disturbances caused by upper extremity movements," **R.J. Triolo**, K.N. Werner, R.F. Kirsch. *IEEE Transactions on Rehabilitation Engineering* 9(2): 1-8, 2001. PMID: 11474966
116. "Surgical technique for installing an 8-channel neuroprosthesis for standing," JA Davis, **R.J. Triolo**, J.P. Uhlir, N. Bhadra, D.A. Lissy, S. Nandurkar, E.B. Marsolais. *Clinical Orthopaedics and Related Research*. 2001(4): 237-252, 2001. PMID: 11302320
117. "Architecture of the rectus abdominis, quadratus lumborum, and erector spinae." S. Delp, S. Suryanarayanan, W. Murray, J. Uhlir and **R. Triolo**. *Journal of Biomechanics* 34(3): 371-375, 2001. PMID: 11182129
118. "Implications of hip subluxation for FES-assisted mobility in patients with spinal cord injury," R. Betz, **R.J. Triolo**, M.J. Mulcahey, J. McCarthy, B.T. Smith. *Orthopaedics* 24(2):181-184, 2001. PMID: 11284603
119. "The use of selective stimulation of the quadriceps to improve standing function in paraplegia," J.P. Uhlir, **R.J. Triolo**, R. Kobetic. *IEEE Transactions on Rehabilitation Engineering*. 8(4): 514-522, 2000. PMID: 11204043.
120. "Electrical stimulation: current practice and emerging concepts – introduction to the special issue of assistive technology on electrical stimulation." **R.J. Triolo**. *Assistive Technology* 12(1): 2-5, 2000. DOI:10.1080/10400435.2000.10132005
121. "Neuromuscular stimulation for motor neuroprostheses in hemiplegia." J. Chae, **R. Triolo**, K. Kilgore, and D. Yu. *Critical Reviews in Physical Medicine and Rehabilitation* 12: 1-23, 2000. DOI: 10.1310/tsr1505-412, PMID: 19008202.
122. "Implanted functional electrical stimulation system for mobility in paraplegia: a follow-up case report." R. Kobetic, **R.J. Triolo**, J. Uhlir, C. Bieri, M. Wibowo, G. Polando, E. B. Marsolais, J.A. Davis, K. Ferguson, M. Sharma. *IEEE Transactions on Rehabilitation Engineering* 7(4): 390-398, 1999. PMID: 10609626
123. "Walking with a hybrid orthosis system." K. Ferguson, G. Polando, R. Kobetic, **R.J. Triolo**, E.B. Marsolais. *Spinal Cord (formerly Paraplegia)* 37: 800-804, 1999. PMID: 10578252
124. "Lower extremity applications of functional neuromuscular stimulation after spinal cord injury," **R.J. Triolo**, K. Bogie. *Topics in SCI Rehabilitation* 5(1): 44-65, 1999. DOI: 10.1310/UXUE-5L1R-WKKV-1RGP
125. "Implantation of a 16-channel functional electrical stimulation walking system." M. Sharma, E.B. Marsolais, G. Polando, **R.J. Triolo**, J.A. Davis, N. Bhadra, J. Uhlir. *Clinical Orthopaedics and Related Research*. 347: 236-242, 1998. PMID: 9520896
126. "Clinical perspectives on neuromuscular stimulation in children with incomplete spinal cord injuries." **R.J. Triolo**. *Pediatric Physical Therapy*. 9(3): 139-143, 1997. DOI:10.1097/00001577-199700930-00009
127. "Muscle selection and walking performance of multichannel FES systems for ambulation in paraplegia." R. Kobetic, **R.J. Triolo**. *IEEE Transactions on Rehabilitation Engineering*. 5(1): 23-29, 1997. PMID: 9086382
128. "Experimental evaluation of an adaptive feedforward controller for use in functional neuromuscular stimulation systems." J.J. Abbas, **R.J. Triolo**. *IEEE Transactions on Rehabilitation Engineering* 5(1): 12-22, 1997. PMID: 9086381
129. "Motor responses to FES electrodes in a growing limb," J.M. Akers, **R.J. Triolo**, R.R. Betz. *IEEE Transactions on Rehabilitation Engineering*. 4(4): 243-250, 1996. PMID: 8973950

130. "Implanted FNS systems for assisted standing and transfers for individuals with cervical spinal cord injuries: clinical case reports," **R.J. Triolo**, C. Bieri, J. Uhler, R. Kobetic, A. Scheiner, E.B. Marsolais. *Archives of Physical Medicine & Rehabilitation*. 77(11): 1119-1128, 1996. PMID: 8931521
131. "The bone mineral content of children with spinal cord injury." M. Moynahan, R.R. Betz, **R.J. Triolo**, A. Mauer. *Journal of Spinal Medicine*. 19(4):249-254, 1996. PMID: 9237792
132. "Home use of a FES system for standing and mobility in adolescents with spinal cord injury." M. Moynahan, C. Mullin, J. Cohn, C.A. Burns, E.E. Halden, **R.J. Triolo**, R.R. Betz. *Archives of Physical Medicine & Rehabilitation*. 77(10):1005-1013, 1996. PMID: 8857878
133. "Challenges to clinical deployment of upper extremity neuroprostheses," **R.J. Triolo**, R. Nathan, Y. Handa, M. Keith, R. Betz, S. Carroll, K. Kantor. *Journal of Rehabilitation Research and Development*. 33(2):111-122, 1996. PMID: 8724167
134. "Effects of functional neuromuscular stimulation on the joints of adolescents with spinal cord injury." R. Betz, B. Boden, **R.J. Triolo**, M. Mesgarzadeh, E. Gardner, R. Fife. *Paraplegia* 34:127-136, 1996. DOI: 10.1038/sc.1996.25
135. "Inter-rater reliability of a clinical test of standing function," **R.J. Triolo**, G. Eisenhower, T. Stabinski, D. Wormser. *Journal of Spinal Cord Medicine*, 18(1):13-21, 1995. PMID: 7640969
136. "Application of functional neuromuscular stimulation to children with spinal cord injuries: candidate selection for research applications," **R.J. Triolo**, R.R. Betz, M.J. Mulcahey, E.R. Gardner. *Paraplegia*, 32: 824-43, 1994. PMID: 7708423
137. "Reliability of percutaneous intramuscular electrodes for upper extremity functional neuromuscular stimulation in adolescents with tetraplegia," B.T. Smith, R.R. Betz, M.J. Mulcahey, **R.J. Triolo**. *Archives of Physical Medicine and Rehabilitation*, 75: 939-45, 1994. PMID: 085926
138. "Functional neuromuscular stimulation: outcomes in young people with tetraplegia," M.J. Mulcahey, B.T. Smith, R.R. Betz, **R.J. Triolo**, P.H. Peckham. *Journal of the American Paraplegia Society*, 17(1): 20-35, 1994. PMID: 8169602
139. "Development and standardization of a clinical evaluation of standing function," **R.J. Triolo**, B. Reilley, W. Freedman, R. Betz. *IEEE Transactions on Rehabilitation Engineering*, 1(1): 18-25, 1993. DOI: 10.1109/IEMBS.1991.684859
140. "The Functional Standing Test," **R.J. Triolo**, B. Reilley, W. Freedman, R.R. Betz. *IEEE Engineering in Medicine and Biology Magazine*, 11(4): 32-4, 1992. DOI: 10.1109/51.256955
141. "Bipolar latissimus dorsi transposition and functional neuromuscular stimulation to restore elbow flexion in an individual with C4 tetraplegia and C5 denervation," R.R. Betz, M.J. Mulcahey, B.T. Smith, **R.J. Triolo**, A.A. Weiss, M. Moynahan, M.W. Keith, P.H. Peckham. *Journal of the American Paraplegia Society*, 15(4): 220-8, 1992. PMID: 1431869
142. "The application of a modified neuroprosthetic hand system in a child with a C7 spinal cord injury," B.T. Smith, M.J. Mulcahey, **R.J. Triolo**, R.R. Betz. *International Journal of Paraplegia*, 30: 598-606, 1992. PMID: 1523004
143. "The experimental demonstration of a multichannel time series myoprocessor: system testing and evaluation," **R.J. Triolo**, G.D. Moskowitz. *IEEE Transactions on Biomedical Engineering*, 36(10): 1004-17, 1989. PMID: 2793195

144. "The theoretical development of a multichannel time series myoprocessor for simultaneous limb function detection and muscle force estimation," **R.J. Triolo**, G.D. Moskowitz. *IEEE Transactions on Biomedical Engineering*, Vol. 36(10): 1018-27, 1989. PMID: 2793194
145. "Tetanic responses of electrically stimulated paralyzed muscle at varying interpulse intervals," S.G. Carroll, **R.J. Triolo**, H.J. Chizeck, R. Kobetic and E.B. Marsolais. *IEEE Transactions on Biomedical Engineering*, 36(7): 644-54, 1989. PMID: 2787276
146. "Identification of time series models of lower extremity EMG for control of prostheses using Box Jenkins criteria," **R.J. Triolo**, D. Nash, G. Moskowitz. *IEEE Transactions on Biomedical Engineering*, 35(8): 584-95, 1988. PMID: 3169809
147. "Comments on upper extremity limb function discrimination using EMG signal analysis and the relationship between parallel-filtering and hypothesis-testing limb function classifiers," **R.J. Triolo**, G. Moskowitz. *IEEE Transactions on Biomedical Engineering*, 32: 239-41, 1985. PMID: 3997180

Book Chapters:

1. "Hybrid Exoskeletons to Restore Gait in Individuals with Paralysis from Spinal Cord Injury" with C. Chang, R. Kobetic in Wearable Robotics: Systems and Applications (Chapter 3). Peter Ferguson and Jacob Rosen, editors. Elsevier 2019
2. "Functional Electrical Stimulation for Patients with Spinal Cord Disorders" with S. Brose, K. Kilgore, A. DiMarco, D. Bourbeau, G. Nemunaitis in Spinal Cord Medicine S. Kirschblum, D. Campagnolo and J. DeLisa, editors. Lippincott Williams & Wilkins, Philadelphia, PA, 2018
3. "Lower Extremity Motor System Neuroprostheses," Neuromodulation 2nd Edition, Volume 3: Neuromodulation for Motor System Restoration, Chapter 97 pgs 1171-1198. ISBN: 978-0-12-814714-6 (Volume 3). E. Krames, P. Peckham, A. Rezai, editors. Academic Press, Elsevier, 2018
4. "Functional Electrical Stimulation and Spinal Cord Injury" ('Lower Extremity Functional Restoration' and 'Trunk Control and Posture' sections) with C. Ho, M. Audu, S. Chang, R. Kobetic and A. Vette in Physical Medicine and Rehabilitation Clinics of North America, C. Ho, editor. Elsevier, Philadelphia, PA 25(2014):631-654. <http://dx.doi.org/10.1016/j.pmr.2014.05.001>.
5. "Ambulation and Spinal Cord Injury" with E. Hardin in Ambulation in Adults with Central Neurologic Disorders, F. Bethoux, Editor. Elsevier, Philadelphia, PA, 2013, (pp. 355-370). DOI: 10.1016/j.pmr.2012.11.002.
6. "Neuromuscular Electrical Stimulation in Spinal Cord Injury" with G. Nemunaitis, K. Kilgore, R. Kobetic, G. Creasey and A. DiMarco in Spinal Cord Medicine, S. Kirschblum, D. Campagnolo and J. DeLisa, editors. Lippincott Williams & Wilkins, Philadelphia, PA, 2011, Chapter 25.
7. "The Next Step: Restoring Walking after Paralysis" with R. Kobetic in Human Walking, 3rd edition, Jessica Rose Agramonte, editor. Lippincott Williams & Williams, Philadelphia, PA, 2006 Chapter 13 (pp.209-222).
8. "Neuromuscular Electrical Stimulation in Spinal Cord Injury" with J. Chae, K. Kilgore, G. Creasey and A. DiMarco in Spinal Cord Medicine, S. Kirschblum, D. Campagnolo and J. DeLisa, editors. Lippincott Williams & Wilkins, Philadelphia, PA, 2003, Chapter 25, (pp. 360-388).

9. "The Role of Electrical Stimulation in Management of Spinal Cord Injury Patients" with E.B. Marsolais, R. Kobetic and S. Nandurkar in Comprehensive Management of the Spinal Cord Injured Patient, B.Y. Lee and L.E. Ostrander, editors. Demos Publishing, New York, NY, 2002. Chapter 16 (pp.201-230).
10. "Movement Synthesis and Regulation in Neuroprostheses" with P. Crago and R. Kirsch in Biomechanics and Neural Control of Movement, J.M. Winters and P.E. Crago, editors. Springer-Verlag, New York, NY 2000. Chapter 42 (pp. 573-589).
11. "Functional Electrical Stimulation in Spinal Cord Injury" with J. Chae, K. Kilgore and G. Creasey in Physical Medicine and Rehabilitation Clinics of North America: Topics in Spinal Cord Injury Medicine G.H. Kraft and M.C. Hammond, editors W.B. Saunders Company (Harcourt Brace Jovanovich, Inc.), Philadelphia, PA. February 2000 (pp. 209-226).
12. "Functional Neuromuscular Stimulation" with J. Chae, K. Kilgore, and G. Creasey in Rehabilitation Medicine: Principles and Practices, Edition 3, J. DeLisa & B. Gans, editors. Lippincott Raven, Philadelphia, PA, 1998. Chapter 24 (pp. 611-634).
13. "Standing and Walking with FNS: Technical and Clinical Challenges" with R. Kobetic and R. Betz, in Human Motion Analysis, G. Harris editor. IEEE Press, New York, NY, 1996 (pp. 318-350).
14. "Overview of Research in Pediatric SCI" in The Child with a Spinal Cord Injury, R. Betz editor. American Academy of Orthopaedic Surgeons Press, Rosemont, IL, 1996 (pp. 691-697).
15. "EMG Theory" with H. Hillstrom, in Gait Analysis: Theory and Application, R. Craik and C. Oatis editors. Mosby Yearbooks, St. Louis, MO, 1995 (pp. 271-92).

Other Publications:

1. "The Need for Understanding and Engaging the Patient as Consumer of Products Developed by Neural Engineering," D. Bardot, E. Graczyk, A. Hess-Dunning, J. Luis Lujan, M. Moynahan, W. Tan, **R. Triolo**, A. Zbrazeski, Editorial: *Journal of Neural Engineering*, 15: 040201, <https://doi.org/10.1088/1741-2552/aac668>, June 2018.
2. "Reflections on *Bioengineering Evaluation and Field Test of the Stand-Alone Therapeutic Aid*," **R. Triolo**, Editorial: *Journal of Rehabilitation Research & Development*, 50(4): xvii, 2013. DOI: 10.1682/JRRD.2013.02.0046

Abstracts & Posters (Total ~ 300):

1. "Neural networks trained via reinforcement learning stabilize walking of a three-dimensional biped model with exoskeleton applications," Chujun Liu, Musa Audu, **Ronald Triolo**, Roger Quinn, *Living Machines 2020* – submitted.
2. An integrated control system for optimal human trunk motion," Xuefeng Bao, Aidan Friederich, Musa. L. Audu, **Ronald Triolo**, *BioRob 2020: International Conference for Biomedical Robotics and Biomechatronics*, New York NY, July 2020.
3. "Neural stimulation eliciting sensation activates reflex pathways in lower-limb amputees," Charkhkar, K. Cheng, N. Makowski, **R. Triolo**, *2019 Society for Neuroscience (SfN) Annual Meeting*, Chicago IL, October 19-23 2019.
4. "Evaluating the role of electrically-evoked plantar sensation in an ambulatory searching task," B. Christie, H. Charkhkar, C. Shell, D. Tyler, **R. Triolo**, *2019 Society for Neuroscience (SfN) Annual Meeting*, Chicago IL, October 19-23 2019.

5. "Accurate characterization of nonlinear recruitment properties of trunk musculature," A. Friederich, M. Audu, **R. Triolo**, *Biomedical Engineering Society (BMES) Annual Meeting*, Philadelphia PA, October 16-19 2019.
6. "Posture adjustment strategies while standing with an implanted neuroprosthesis," B. Odle, M. Audu, **R. Triolo**, *Biomedical Engineering Society (BMES) Annual Meeting*, Philadelphia PA, October 16-19 2019 – submitted.
7. "Feasibility of neural stimulation to facilitate assisted transfers after paralysis," B. Odle, N. Bean, L. Lombardo, N. Audu, **R. Triolo**, *Academy of Spinal Cord Injury Professionals (ASCIP) Annual Meeting*, Nashville TN, September 2019.
8. "Neuroprosthesis providing grasp/reach/posture control after cervical SCI," K. Kilgore, A. Bryden, R. Hart, L. Lombardo, M. Miller, H. Hoyen, M. Keith, **R. Triolo**, G. Pinault, G. Nemunaitis, C. Oleson, P.H. Peckham, *Academy of Spinal Cord Injury Professionals (ASCIP) Annual Meeting*, Nashville TN, September 2019.
9. "Long-term comparison of implanted neuroprosthesis for walking after SCI," L. Lombardo, N. Makowski, K. Foglyano, R. Kobetic, **R. Triolo**, *Academy of Spinal Cord Injury Professionals (ASCIP) Annual Meeting*, Nashville TN, September 2019.
10. "Clinical evaluation of a novel assistive device for safe stair negotiation," S. Bailey, F. Zitko, **R. Triolo**, *Rehabilitation Engineering Society of North America (RESNA) Meeting*, Toronto CA, June 2019.
11. "Functional neuromuscular stimulation to facilitate assisted transfers: a pilot study," N. Bean, B. Odle, L. Lombardo, M. Audu, **R. Triolo**, *Rehabilitation Engineering Society of North America (RESNA) Meeting*, Toronto CA, June 2019. **Honorable Mention, Student Scientific Paper Competition**
12. "Probing peripheral neural pathways in electrically stimulation induced sensation," K. Cheng, H. Charkhkar, J. Yu, N. Makowski, **R. Triolo**, *EMBS Conference on Neural Engineering (NER19)*, San Francisco CA, March 20-23, 2019.
13. "Augmentation of caregiver dependent transfers with functional neuromuscular stimulation (FNS), N. Bean, B. Odle, L. Lombardo, M. Audu, **R. Triolo**, *Midwest Regional Meeting of the American Society of Biomechanics (ASB)*, Dayton OH, February 2019.
14. "Visual and proprioceptive inputs affect the location of evoked somatosensory percepts in amputees," B. Christie, H. Charkhkar, D. Tyler, **R. Triolo**, *2018 Society for Neuroscience (SfN) Annual Meeting*, San Diego CA, November 2018.
15. "Nerve health parameters following implantation of tibial and peroneal nerve cuff electrodes," C. Delianides, D. Tyler, G. Pinault, **R. Triolo**, R. Ansari, *2018 American Neurological Association Meeting*, Atlanta GA, October 21-23, 2018.
16. "Effects of exoskeletal joint friction compensation on metabolic consumption during walking," R-D Reyes, M. Nandor, C. Mulcahy, R. Kobetic, **R. Triolo**, *2018 Biomedical Engineering Society Meeting*, Atlanta GA, October 17-20, 2018.
17. "Feedback controlled advanced stimulation paradigms prolong moment output with neural stimulation after spinal cord injury," T. Gelenitis, M. Freeberg, **R. Triolo**, *2018 Biomedical Engineering Society Meeting*, Atlanta GA, October 17-20, 2018.
18. "Balancing human ankle motion using implanted tibial and fibular nerve cuffs," C. Delianides, B. Christie, D. Tyler, G. Pinault, **R. Triolo**, *2018 Biomedical Engineering Society Meeting*, Atlanta GA, October 17-20, 2018.

19. "Estimating coronal plane trunk muscle maximum isometric force after spinal cord injury," A. Bheemreddy, N. Alibeji, **R. Triolo**, M. Audu, *2018 Biomedical Engineering Society Meeting*, Atlanta GA, October 17-20, 2018.
20. "Gait restoration after a spinal cord injury: A simulation and experimental study of the double support phase," NA Alibeji, BM Odle, ML Audu, **RJ Triolo**, *American Society of Biomechanics 2018 Annual Meeting*, Rochester MN, August 8-11, 2018.
21. "Development of a model to predict interaction forces between the upper extremity and support devices in individuals with spinal cord injury," BM Odle, NA Alibeji, ML Audu, **RJ Triolo**, *American Society of Biomechanics 2018 Annual Meeting*, Rochester MN, August 8-11, 2018.
22. "A sensor fusion algorithm for estimating center of mass kinematics in human walking after spinal cord injury," ML Audu, NA Alibeji, BM Odle, **RJ Triolo**, *American Society of Biomechanics 2018 Annual Meeting*, Rochester MN, August 8-11, 2018.
23. "The effect of sensory feedback on postural stability in lower-limb amputees," H. Charkhkar, B. Christie, D. Tyler, **R. Triolo**. *Neural Interfaces Conference 2018*, Minneapolis MN, June 24-26 2018
24. "Somatosensory feedback via peripheral nerve stimulation minimizes postural sway while trans-tibial amputees multi-task," B. Christie, H. Charkhkar, D. Tyler, **R. Triolo**, *Neural Interfaces Conference 2018*, Minneapolis MN, June 24-26 2018
25. "Examining C-FINE selectivity and motor unit fatigue properties for optimization of moment-prolonging advanced stimulation paradigms," K. Gelenitis, B. Sanner, D. Tyler, **R. Triolo**, *Neural Interfaces Conference 2018*, Minneapolis MN, June 24-26 2018.
26. "An implanted neuroprosthesis for grasp, reach and posture control in cervical spinal cord injury," K. Kilgore, H. Hoyen, M. Keith **R. Triolo**, A. Bryden, L. Lombardo, R. Hart, M. Miller, G. Pinault, G. Nemunaitis, P. Peckham, *Neural Interfaces Conference 2018*, Minneapolis MN, June 24-26 2018.
27. "Multi-joint neuromuscular electrical stimulation improves post-stroke gait kinematics," N. Makowski, R. Kobetic, K. Foglyano, L. Lombardo, S. Nogan-Bailey, G. Pinault, S. Selkirk, **R. Triolo**, *40th International Conferences of the IEEE Engineering in Medicine & Biology Society (EMBC2018)*, Honolulu HI, July 17-21, 2018.
28. "Embedded control system for stimulation-driven exoskeleton," L. Li, J. Schnellenberg, M. Nandor, S. Chang, K. Foglyano, R. Reyes, M. Audu, **R. Triolo**, R. Quinn. *IEEE International Symposium on Medical Robotics (ISMR)*, 978-1-5386-2512-5/18/, Atlanta GA, March 1-3, 2018.
29. "A new distributed neuroprosthesis enables hand grasp and trunk posture after cervical spinal cord injury," K. Kilgore, H. Hoyen, M. Keith, A. Bryden, L. Lombardo, R. Hart, Mi. Miller, **R. Triolo**, G. Pinault, G. Nemunaitis, P.H. Peckham, *Scientific Meeting of the American Spinal Injury Association*, Minneapolis NM, May 2018
30. "Alternative ways to exercise after SCI – Overground cycling with electrical stimulation," L. Lombardo, K. Foglyano, S. Bailey, **R. Triolo**, J. McDaniel, *Scientific Meeting of the American Spinal Injury Association*, Minneapolis NM, May 2018
31. "Modulation of trunk stimulation to improve efficiency of manual wheelchair propulsion," S. Bailey, L. Lombardo, **R. Triolo**, *Scientific Meeting of the American Spinal Injury Association*, Minneapolis NM, May 2018

32. “Automatic ‘neural seatbelts’ maintain seated stability during destabilizing wheelchair events,” K. Armstrong, M. Audu, L. Lombardo, K. Foglyano, **R. Triolo**, *Scientific Meeting of the American Spinal Injury Association*, Minneapolis NM, May 2018
33. “Surgically implanted nerve cuff electrodes stabilize rapidly and preserve chronic nerve health in anatomically challenging locations,” M. Freeberg, G. Pinault, L. Lombardo, D. Tyler, R. Ansari, **R. Triolo**, *Scientific Meeting of the American Spinal Injury Association*, Minneapolis NM, May 2018.
34. Timing of restored tactile sensation in people with lower limb amputations,” B. Christie, H. Charkhkar, E. Graczyk, D. Tyler, **R. Triolo**, *Biomedical Engineering Society (BMES) Conference*, November 2017.
35. “Latency of the perceived sensation evoked by peripheral nerve stimulation in people with lower limb amputations,” B. Christie, H. Charkhkar, D. Tyler, **R. Triolo**, *Society for Neurosciences (SfN) Annual Meeting*, October 2017, Washington DC.
36. “Exploiting the selectivity of multi-contact peripheral nerve cuff electrodes to prolong standing times with neural stimulation after spinal cord injury,” KJ. Gelenitis, M. Freeberg, **R. Triolo**, *Biomedical Engineering Society (BMES) Annual Meeting*, October 11-14, 2017 Phoenix AZ.
37. “Automatically detecting destabilizing wheelchair conditions and applying electrical stimulation to maintain seated posture,” K. Armstrong, M. Audu, **R. Triolo**, *Biomedical Engineering Society Conference*, Phoenix, AZ, USA, October 11– 14, 2017.
38. “Latency of the perceived sensation evoked by peripheral nerve stimulation in people with lower limb amputations,” B. Christie, H. Charkhkar, D. Tyler, **R. Triolo**, *Biomedical Engineering Society (BMES) Annual Meeting*, October 11-14, 2017 Phoenix AZ.
39. “Peak oxygen consumption with implanted stimulation-driven cycling,” L. Lei Valentas, R. Kobetic, L. Lombardo, K. Foglyano, J. McDaniel, **R. Triolo**, *Academy of Spinal Cord Injury Professionals Educational Conference*, Denver CO, USA, September 3–6, 2017.
40. “Automatic detection of destabilizing wheelchair conditions for modulating actions of neuroprostheses to maintain seated posture, K. Armstrong, M. Audu, **R. Triolo**, *Academy of Spinal Cord Injury Professionals Educational Conference*, Denver CO, USA, September 3–6, 2017.
41. “Retrospective summary of stimulated responses from implanted paraspinal electrodes,” M. Miller, L. Lombardo, H. Hoyen, G. Pinault, **R. Triolo**, *Academy of Spinal Cord Injury Professionals Educational Conference*, Denver CO, USA, September 3– 6, 2017.
42. “Neural interface technology to restore natural sensation in lower-limb amputees,” H. Charkhkar, C. Shell, P. Marasco, D. Tyler, **R. Triolo**, *Myoelectric Control Conference (MEC17)*, August 14-18 2017, Frederick NB, Canada.
43. “Standing balance responses to phantom limb sensory stimuli in below-knee amputees,” C. Shell, H. Charkhkar, D. Tyler, P. Marasco, **R. Triolo**, *41st Annual Meeting of the American Society of Biomechanics*, Boulder CO, USA, August 8th –11th, 2017
44. “Sagittal plane control of trunk posture after spinal cord injury,” M. Audu, L. Lombardo, **R. Triolo**, *41st Annual Meeting of the American Society of Biomechanics*, Boulder CO, USA, August 8th –11th, 2017.
45. “Automatic application of neural stimulation during wheelchair propulsion after SCI enhances recovery of upright sitting from destabilizing events,” K. Armstrong, M. Audu, **R. Triolo**, *41st Annual Meeting of the American Society of Biomechanics*, Boulder CO, USA, August 8th-11th, 2017.

46. "Neuroprosthetic implant improves walking ability in stroke patients," NS Makowski, R Kobetic, LM Lombardo, KF Foglyano, G Pinault, SM Selkirk, **RJ Triolo**, *Today's Geriatric Medicine* 2016, vol. 9, pgs. 28–29.
47. "Tracking nerve health following implantation of bilateral femoral nerve cuff electrodes (NCDs)," M.J. Freeberg, G.C. Pinault, D.J. Tyler, **R.J. Triolo**, R. Ansari, *American Neurological Association 141st Meeting*, Baltimore, MD, October 16–18, 2016.
48. A stimulation-driven exoskeleton for walking after paraplegia," S.R. Chang, M.J. Nandor, L. Li, L.M. Foglyano, J.R. Schnellenberger, R. Kobetic, R.D. Quinn, **R.J. Triolo**, *38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Orlando, FL, August 16–20, 2016.
49. "Long-term stability of stimulating multi-contact nerve cuff electrodes on human peripheral nerves," B.P. Christie, M. Freeberg, K.M. Foglyano, M.E. Miller, L.E. Fisher, D.J. Tyler, **R.J. Triolo**, *38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Orlando, FL, August 16–20, 2016.
50. "Reactive stepping with functional neuromuscular stimulation in response to forward directed perturbations," A.J. Hunt, B.M. Odle, L.M. Lombardo, M.L. Audu, **R.J. Triolo**, *38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Orlando, FL, August 16–20, 2016.
51. "Center of pressure feedback control of posture in an implanted standing neuroprosthesis," B. Odle, A. Hunt, M. Audu, L. Lombardo, **R. Triolo**, *38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Orlando, FL, August 16–20, 2016.
52. "Short-term chronic stability and selectivity of 8-contact compliant flat interface nerve electrodes stimulating human femoral nerves," M.J. Freeberg, R. Ansari, G.C. Pinault, D.J. Tyler, **R.J. Triolo**, *38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Orlando, FL, August 16–20, 2016.
53. "A hydraulic hybrid neuroprosthesis for gait restoration in people with spinal cord injuries," N.M.J. Nandor, S.R. Chang, R. Kobetic, **R.J. Triolo**, R. Quinn, *Living Machines V: 5th International Conference on Biomimetic and Biohybrid Systems*, Edinburgh, Scotland, July 18–22, 2016.
54. "Center of pressure feedback control of task-dependent postures with an implanted standing neuroprosthesis," B.M. Odle, A.J. Hunt, M.L. Audu, L. Lombardo, **R.J. Triolo**, *North American Neuromodulation Society and NIH Neural Interfaces Conference Joint Meeting*, Baltimore, MD, June 25–29, 2016.
55. "Multi- and single-joint selectivity optimization of the 8-contact composite flat interface nerve electrode on the human femoral nerve," M.J. Freeberg, R. Ansari, G.C. Pinault, D.J. Tyler, **R.J. Triolo**, *North American Neuromodulation Society and NIH Neural Interfaces Conference Joint Meeting*, Baltimore, MD, June 25–29, 2016.
56. "Long-term stability of stimulating multi-contact nerve cuff electrodes on human peripheral nerves," B.P. Christie, M. Freeberg, K.M. Foglyano, M.E. Miller, L.E. Fisher, D.J. Tyler, **R.J. Triolo**, *North American Neuromodulation Society and NIH Neural Interfaces Conference Joint Meeting*, Baltimore, MD, June 25–29, 2016.
57. "Six-year follow-up on implanted neuroprostheses for upright mobility after paralysis," **R. Triolo**, S. Bailey, K. Foglyano, R. Kobetic, L. Lombardo, M. Miller, S. Selkirk, G. Pinault, *North American Neuromodulation Society (NANS) and Neural Interfaces Conference (NIC) Joint Meeting*, Baltimore, MD, June 25–29, 2016.

58. "A hydraulic hybrid neuroprosthesis for gait restoration in people with spinal cord injuries," M.J. Nandor, S. R. Chang, R. D. Quinn, **R. J. Triolo**, R. Kobetic, *Living Machines V: The 5th International Conference on Biomimetic and Biohybrid Systems*, Edinburgh, Scotland, July 18–22, 2016.
59. "A stimulation-driven exoskeleton for walking after paraplegia," S.R. Chang, M.H. Nandor, L. Li, K.M. Foglyano, J.R. Schnellenberger, R. Kobetic, R.D. Quinn, **R. J. Triolo**, *IEEE Engineering in Medicine & Biology Conference (EMBC)*, Orlando, FL, August 16–20, 2016.
60. "Utilizing hip and ankle stimulation in an individual with MS to improve ambulation," L. Lombardo, R. Kobetic, S. Nogan-Bailey, K. Foglyano, S. Selkirk, G. Pinault, **R. Triolo**, *Paralyzed Veterans of America 6th Annual Summit & Expo*, August 30–September 1, 2016.
61. "A neuroprosthesis for coronal plane trunk control," M. Audu, **R. Triolo**, *World Congress for Neurorehabilitation (WCNR 2016)*, Philadelphia, PA, May 11–13, 2016.
62. "Improving community ambulation in incomplete spinal cord injury with a neuroprosthesis," L. Lombardo, S. Nogan-Baily, K. Foglyano, R. Kobetic, G. Pinault, **R. Triolo**, *World Congress for Neurorehabilitation (WCNR 2016)*, Philadelphia, PA, May 11–13, 2016.
63. "An implanted multi-joint neuroprosthesis for gait assistance consistently improves walking speed: a case report," N. Makowski, R. Kobetic, L. Lombardo, K. Foglyano, G. Pinault, S. Selkirk, **R. Triolo**, *World Congress for Neurorehabilitation (WCNR 2016)*, Philadelphia, PA, May 11–13, 2016.
64. "Implanted network for motor function in cervical SCI," K.L. Kilgore H.A. Hoyen, M.W. Keith, **R.J. Triolo**, A.M. Bryden, L. Lombardo, R.H. Hart, M. Miller, G.A. Nemunaitis, P.H. Peckham, *2016 American Spinal Injury Association (ASIA) Meeting*, Philadelphia, PA, April 14–16, 2016.
65. "Improving walking with an implanted pulse generator for hip, knee, and ankle control after stroke: a case report," N. Makowski, R. Kobetic, L. Lombardo, K. Foglyano, G. Pinault, S. Selkirk, **R. Triolo**, *American Society of NeuroRehabilitation Annual Meeting*, Chicago, IL, October 2015
66. "Using hybrid neuroprostheses to improve stand-to-sit maneuver for individuals with paraplegia," S.R. Chang, M.J. Nandor, K.M. Foglyano, M. Lesieutre, R. Kobetic, **R.J. Triolo**, *39th Annual Meeting of the American Society of Biomechanics* August 5–8, 2015, Columbus, OH.
67. "Simulation of leaning standing after spinal cord injury," R. Nataraj, M.L. Audu, **R.J. Triolo**, *Dynamic Walking Conference 2015*, The Ohio State University, July 21–24, 2015, Columbus, Ohio.
68. "Effects of stimulation on non-erect postures with a standing neuroprosthesis," M.L. Audu, B. Odle, R. Nataraj, **R.J. Triolo**, *World Congress on Medical Physics & Biomedical Engineering*, June 7–12, 2015, Toronto, CA.
69. "A neuroprosthesis decreasing upper extremity demands during pivot transfers after spinal cord injury," S. Bailey, E. Slivka, N. DiSalvio, L. Lombardo, K. Foglyano, **R. Triolo**, *World Congress on Medical Physics & Biomedical Engineering*, June 7–12, 2015, Toronto, CA.
70. "Automatic detection of destabilizing wheelchair conditions for modulating actions of neuroprostheses to maintain seated posture," A. Crawford, M. Audu, **R. Triolo**, *World Congress on Medical Physics & Biomedical Engineering*, June 7–12, 2015, Toronto, CA.
71. "Selecting upper extremity command signals to modulate electrical stimulation of trunk muscles during manual wheelchair propulsion," K. Tepe, S. Nogan-Bailey, M.L. Audu, **R.J.**

- Triolo**, *World Congress on Medical Physics & Biomedical Engineering*, June 7–12, 2015, Toronto, CA.
72. “Design of orthotic mechanisms to control stand-to-sit maneuver for individuals with paraplegia,” S.R. Chang, M.J. Nandor, K.M. Foglyano, M. Lesieutre, R. Kobetic, **R.J. Triolo**, *World Congress on Medical Physics & Biomedical Engineering*, June 7–12, 2015, Toronto, CA.
 73. “A neuroprosthesis decreasing upper extremity demands during pivot transfers after spinal cord injury,” S. Bailey, E. Slivka, N. DiSalvio, L. Lombardo, K. Foglyano, **R. Triolo**, *American Society of Biomechanics*, University of Akron, February 17, 2015, Akron, OH.
 74. “Estimating center of mass kinematics with a networked neuroprosthesis for standing,” R. Nataraj, M.L. Audu, **R.J. Triolo**, *36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, August 26–30, 2014, Chicago, IL.
 75. “Coordinating hip and knee joints with a hybrid neuroprosthesis,” S.R. Chang, M.J. Nandor, K. Foglyano, R. Kobetic, **R.J. Triolo**, *36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, August 26–30, 2014, Chicago, IL.
 76. “A neuroprosthesis for maintaining seated balance after spinal cord injury,” M.L. Audu, L. Lombardo, **R.J. Triolo**, *Military Health System Research Symposium (MHSRS)*, August, 2014, Ft Lauderdale, FL.
 77. “Myoelectric and cyclic control of an implanted neuroprosthesis to modulate gait speed in incomplete SCI,” L. Lombardo, S. N. Bailey, K. Foglyano, M. Miller, G. Pinault, **R. Triolo**, *Academy of Spinal Cord Injury Professionals*, August 31 – September 3, 2014, St. Louis, MO.
 78. “Restoration of leaning standing function using functional neuromuscular stimulation following spinal cord injury,” R. Nataraj, M. Audu, **R. Triolo**, *World Congress of Biomechanics*, July 6–11, 2014, Boston, MA.
 79. “A perturbation rejection controller for seated balance after spinal cord injury,” M. Audu, L. Marinis, **R. Triolo**, *World Congress of Biomechanics*, July 6–11, 2014, Boston, MA.
 80. “Fully-implanted trunk and upper extremity neuroprosthesis for cervical SCI,” K. Kilgore, M. Keith, H. Hoyer, J. Anderson, **R. Triolo**, A. Bryden, L. Lombardo, G. Nemunaitis, P. Peckham, *2014 American Spinal Injury Society (ASIA) Meeting*, May 14–17 2014, San Antonio, TX.
 81. “Feedback control to restore forward standing balance using functional neuromuscular stimulation following spinal cord injury,” R. Nataraj, M.L. Audu, **R.J. Triolo**, *Midwest Meeting of the American Society of Biomechanics*, March 4–5, 2014, Akron, OH.
 82. “Are Paralyzed Muscle Strengths Underestimated,” M. Audu, **R. Triolo**, *Midwest Meeting of the American Society of Biomechanics*, March 4–5, 2014, Akron, OH.
 83. “Comparison of Self-Leveling Walker to Bilateral Handrails for Stair Negotiation,” S. N. Bailey, A. Sheehan, K. Foglyano, L. Lombardo, **R. Triolo**, *Midwest Meeting of the American Society of Biomechanics*, March 4–5, 2014, Akron, OH.
 84. “Controlling Gait Speed with Electromyogram in an Implanted Neuroprosthesis for Incomplete Spinal Cord Injury,” K. Foglyano, L. Lombardo, M. Miller, S.N. Bailey, **R. Triolo**, *Midwest Meeting of the American Society of Biomechanics*, March 4–5, 2014, Akron, OH.
 85. “Stand-to-sit Maneuver after Paralysis Using Functional Neuromuscular Stimulation,” S. Chang, R. Kobetic, **R.J. Triolo**, *Midwest Meeting of the American Society of Biomechanics*, March 4–5, 2014, Akron, OH.

86. "Forward Walker Movement Detect for Triggered Functional Electrical Stimulation," A. Crawford, J. Schnellenger, **R. Triolo**, *Midwest Meeting of the American Society of Biomechanics*, March 4–5, 2014, Akron, OH.
87. "Restoration of Leaning Standing Function Using Functional Neuromuscular Stimulation Following Spinal Cord Injury," R. Nataraj, M.L. Audu, **R. Triolo**, *Midwest Meeting of the American Society of Biomechanics*, March 4–5, 2014, Akron, OH.
88. "Chronic Response of the Cat Sciatic, Median and Ulnar Nerves to a Compliant, Composite Flat Interface Nerve Electrode (C-FINE)," M. Freeberg, M. Stone, D. Tyler, **R. Triolo**, *IEEE EMBS Neural Engineering Conference*, San Diego, CA, November 2013.
89. "Mechanical Characterization of a Novel Multilayer Nerve Cuff Electrode with Regionally Patterned Stiffness," M. Stone, D. Tyler, **R. Triolo**, *IEEE EMBS Neural Engineering Conference*, San Diego, CA, November 2013.
90. "Stand-to-Sit Maneuver in Paraplegia after Spinal Cord Injury using Functional Neuromuscular Stimulation," S. Chang, R. Kobetic, **R. Triolo**, *IEEE EMBS Neural Engineering Conference*, San Diego, CA, November 2013.
91. "Myoelectric Control of an Implanted Neuroprosthesis to Restore Gait in Incomplete Spinal Cord Injury," M. Miller, K. Foglyano, L. Lombardo, S. Bailey, **R. Triolo**, *IEEE EMBS Neural Engineering Conference*, San Diego, CA, November 2013.
92. "Controlling Stand-to-Sit Maneuver after Spinal Cord Injury Using a Hybrid Neuroprosthesis," S. Chang, R. Kobetic, **R. Triolo**, *2013 Biomedical Engineering Society Meeting (BMES)*, Seattle, WA, September 25–28, 2013.
93. "Control of Seated Balance after Spinal Cord Injury using Functional Electrical Stimulation," J.O. Murphy, M.L. Audu, **R.J. Triolo**, *Biomedical Engineering Society Meeting (BMES)*, Atlanta, GA, October 24–27, 2012.
94. "Trunk Stability after Spinal Cord Injury," Musa L. Audu, Julie O. Murphy, **Ronald J. Triolo**, *International FES Society Meeting*, Banff, CA, September 9–12, 2012.
95. "Preliminary Evaluation of a Variable Impedance Hybrid Neuroprosthesis for Walking and Stair Descent After Spinal Cord Injury," T. Bulea, R. Kobetic, **R.J. Triolo**, *International FES Society Meeting*, Banff, CA, September 9–12, 2012.
96. "The Effect of Various Functional Electrical Stimulation Control Systems on Gait in Hemiplegia," *International FES Society Meeting*, Banff, CA, September 9–12, 2012.
97. "Multilayer Microfabrication-Compatible Nerve Cuff Electrode with Regionally Patterned Stiffness," M Stone, L Fisher, N Brill, D Tyler, **R Triolo**, *40th Neural Interfaces Conference*, Salt Lake City, UT, June 18–20, 2012.
98. "Sum of Phase-Shifted Sinusoids: A Novel Stimulation Paradigm for Delaying Onset of Fatigue During Peripheral Nerve Stimulation." LE Fisher, DJ Tyler, **RJ Triolo**, *40th Neural Interfaces Conference*, Salt Lake City, UT, June 18–20, 2012.
99. "Design of Nerve Cuff Electrodes for the Sciatic, Tibial and Common Peroneal Nerves Using Probabilistic Models," MA Schiefer, DJ Tyler, **RJ Triolo**, *40th Neural Interfaces Conference*, Salt Lake City, UT, June 18–20, 2012.
100. "An Intelligent Controller to Generate Cyclic Joint Moments," MJ Freeberg, LE Fisher, **RJ Triolo**, *40th Neural Interfaces Conference*, Salt Lake City, UT, June 18–20, 2012.
101. "Enhancing Seated Posture and Bimanual Reach with Stimulation of the Hip and Trunk Muscles," **R.J. Triolo**, S.N. Bailey, L.M. Lombardo, M.E. Miller, M. Richmond, *Topics in Spinal Cord Rehabilitation* 18(1):219, 2012 *American Spinal Cord Injury Society Meeting*, Denver, CO, April 19–21, 2012.

102. “Effects of Trunk Stimulation on Manual Wheelchair Propulsion Mechanics,” L.M. Lombardo, S.N. Bailey, K. Foglyano, M.E. Miller, M.A. Richmond, **R.J. Triolo**, *Topics in Spinal Cord Rehabilitation* 18(1):200, 2012, *American Spinal Cord Injury Society Meeting*, Denver, CO, April 19–21, 2012.
103. “Longitudinal performance of a surgically implanted neuroprosthesis for exercise, standing, and transfers after SCI,” **R.J. Triolo**, S. Nogan Bailey, M.E. Miller, J.S. Anderson, J.A. Davis, Jr., *Topics in Spinal Cord Rehabilitation* 18(1):213, 2012. *American Spinal Cord Injury Society Meeting*, Denver, CO, April 19–21, 2012. **Second Place, Best Oral Paper Competition**
104. “Flexible-Bodied Mobile Robots,” N.I. Kern, R.J. Bachmann, R.J. Michols, **R.J. Triolo**, R.D. Quinn, *IEEE International Conference on Biomedical Robotics and Biomechatronics*, Rome, Italy, June 24–28, 2012.
105. “Restoration of Stance Phase Knee Flexion during Walking after Spinal Cord Injury using a Variable Impedance Orthosis,” T. Bulea, R. Kobetic, **R. Triolo**. *33rd Annual International IEEE EMBS Conference*, Boston, MA, August 30–Sept 3, 2011. DOI: 10.1109/IEMBS.2011.6090135. PMID: 22254383
106. “Optimization of Stimulus Parameters for Selective Peripheral Nerve Stimulation with Multi-Contact Electrodes,” L. Fisher, J. Anderson, D. Tyler **R. Triolo**. *33rd Annual International IEEE EMBS Conference*, Boston, MA, August 30–Sept 3, 2011. DOI: 10.1109/IEMBS.2011.6090831 PMID: 22254980. PMCID: PMC3561902
107. “Efficient Search and Fit Methods to Find Nerve Stimulation Parameters for Multi-Contact Electrodes,” M. Freeberg, M. Schiefer, **R. Triolo**. *33rd Annual International IEEE EMBS Conference*, Boston, MA, August 30–Sept 3, 2011.
108. “Probabilistic Modeling of Selective Stimulation of the Human Sciatic Nerve with a Flat Interface Nerve Electrode,” M. Schiefer, D. Tyler, **R. Triolo**. *33rd Annual International IEEE EMBS Conference*, Boston, MA, August 30–Sept 3, 2011. DOI: 10.1109/IEMBS.2011.6091011. PMID: 22255234. PMCID: PMC3576428
109. “Human Distal Sciatic Nerve Fascicular Anatomy: Implications for Ankle Control Utilizing Nerve Cuff Electrodes,” S. Joseph, K. Gustafson, Y. Grinberg; **R. Triolo**. *International Spinal Cord Society (ISCoS) & American Spinal Injury Association (ASIA) Meeting*, Washington DC, June 4–6, 2011.
110. “Efficacy of Multicontact Spiral Nerve Cuff Electrodes for Standing with an Implanted Neuroprosthesis,” **R. Triolo**, J. Anderson, H. Hoyen, G. Pinault, L. Fisher, L. Lombardo, M. Miller. *International Spinal Cord Society (ISCoS) & American Spinal Injury Association (ASIA) Meeting*, Washington DC, June 4–6, 2011.
111. “Development of a Compliant Trunk Mechanism for Freedom of Movement after Spinal Cord Injury,” N.I. Kern, R. Kobetic, **R.J. Triolo**, R.D. Quinn. *Proceedings of the 1st International Conference on Applied Bionics and Biomechanics (ICABB)*, Venice, Italy, October 2010.
112. “Innovative Approaches to Restoring Motor Function for Individuals with Paralysis Using Functional Electrical Stimulation (FES),” J.S. Anderson, A.M. Bryden, J.A. Davis, L.E. Fisher, R.L. Hart, H. Hoyen, M.W. Keith, K.L. Kilgore, M.E. Miller, G.C. Pinault, L.M. Rohde, K. Tabbaa, **R.J. Triolo**. *Congress of Neurological Surgeons 2010 Annual Meeting*, San Francisco, CA, October 16–21, 2010.
113. “A Neuroprosthesis for Seated Posture and Balance,” L.M. Lombardo, M.E. Miller, S.N. Bailey, K.M. Foglyano, J.F. Marlow, M.L. Audu, M.A. Richmond, **R.J. Triolo**, *Annual*

Meeting of the Academy of Spinal Cord Injury Professionals, Las Vegas, NV, September 22–24, 2010.

114. “Mathematical Models of Recruitment and Stimulation Overlap for Selective Peripheral Nerve Stimulation,” L.E. Fisher, **R.J. Triolo**, *NIH Neural Interfaces Conference*, Long Beach, CA, June 2010. (Poster)
115. “Physiological Impact of Neuromuscular Electrical Stimulation on Trunk Stability,” G. Nemunaitis, **R. Triolo**, L. Boggs, L. Murray, M. Miller, M.J. Roach, J. Nagy, J. Marlow, K. Nicolacakis, M. Mejia. *Journal of Spinal Cord Medicine*, 32(4): 468, 2009.
116. “Wireless *In Vivo* EMG Sensor for Intelligent Prosthetic Control,” B. Farnsworth, D. Taylor, **R. Triolo**, D. Young. *IEEE Transducers Conference*, Denver, CO, June 21–25, 2009.
117. “Hybrid Neuroprosthesis: Combining Bracing with FES for Improved Stability,” N. Kern, C. To, T. Bulea, R.J. Bachmann, A. Polinkovsky, R. Kobetic, R.D. Quinn, **R.J. Triolo**, *Society for Neuroscience*, Washington DC, November 16, 2008.
118. “Wireless Implantable EMG Sensing Microsystem,” B. Farnsworth, **R. Triolo**, D. Young, *IEEE Sensors Conference*, Lecce, Italy, October 26–29, 2008.
119. “A Neuroprosthesis for Seated Postural Stability and Functional Mobility after Spinal Cord Injury,” **R. Triolo**, M. Miller, L. Boggs, S.N. Bailey, G. Nemunaitis, J. Nagy, *38th Annual NIH Neural Interfaces Conference (NIC)*, Cleveland, OH, June 2008.
120. “Dynamic Control for Adjustment of Seated Posture – A Computer Simulation Study,” M.L. Audu, **R.J. Triolo**, *38th Annual NIH Neural Interfaces Conference (NIC)*, Cleveland, OH, June 2008.
121. “Development of Sensor-Feedback Control System for Automatic Standing Maintenance Using Functional Electrical Stimulation following Spinal Cord Injury,” R. Nataraj, M. Audu, R. Kirsch, **R. Triolo**, *38th Annual NIH Neural Interfaces Conference (NIC)*, Cleveland, OH, June 2008.
122. “Development of an EMG-based Controller for an Implanted FES System for Walking After Partial Paralysis,” A. Dutta, R. Kobetic, **R. Triolo**, *38th Annual NIH Neural Interfaces Conference (NIC)*, Cleveland, OH, June 2008.
123. “Trunk Muscle Neuromuscular Stimulation: A Case Study of the Effects on Spinal Alignment and Respiratory Function in a Tetraplegic,” T. Johnson, G. Nemunaitis, J. Nagy, M. Boulet, L. Boggs, M. Miller, J. Anderson, H. Hoyen, M. Keith, K. Nicolacakis, L. Murray, **R. Triolo**, *American Spinal Injury Association (ASIA) meeting*, June 19–22, 2008.
124. “Design of a Finite State Machine for the Variable Constraint Hip Mechanism to Provide Postural Stability During Gait After Spinal Cord Injury,” C.S. To, R. Kobetic, **R.J. Triolo**, *4th International Symposium on Adaptive Motion of Animals and Machines (AMAM)*, Cleveland, OH, June 2008.
125. “Evaluation of Electromyogram-triggered Functional Electrical Stimulation-assisted Stand-to-Walk Transition,” A. Dutta, R. Kobetic, **R. Triolo**, *12th Annual Conference of the International FES Society*, November 2007, Philadelphia, PA.
126. “Dynamic Computer Optimization for Standing Balance and Control of Postural Sway after SCI,” Musa Audu, Ravi Nataraj, Robert Kirsch, **Ronald Triolo**, *12th Annual Conference of the International FES Society*, November 2007, Philadelphia, PA.
127. “Implanted Electrical Stimulation of the Trunk for Seated Postural Stability and Functional Mobility after Cervical SCI,” **RJ Triolo**, L Boggs, A Bryden, R Kirsch, W Memberg, M Miller, L Murray, G. Nemunaitis, K Nicolacakis, S Bailey, J Smith, *12th Annual Conference*

- of the International FES Society, November 2007, Philadelphia, PA. DOI: 10.1016/j.apmr.2008.07.029, PMID: 19236990
128. "Neuroprosthetic and Neurotherapeutic Effects of Implanted Electrical Stimulation for Ambulation after Incomplete SCI," SN Bailey, **RJ Triolo**, EC Hardin, R Kobetic, LM Boggs, LR Murray, BA Seitz, G Pinault, *12th Annual Conference of the International FES Society*, November 2007, Philadelphia, PA. PMID: 20437323
 129. "Automatic Control of Standing Balance Using Functional Electrical Stimulation following Spinal Cord Injury," R Nataraj, ML Audu, RF Kirsch, **RJ Triolo**, *12th Annual Conference of the International FES Society*, November 2007, Philadelphia, PA.
 130. "Stimulating Quadriceps with Four-Contact Nerve Cuff Electrodes to Improve Standing after Spinal Cord Injury," LE. Fisher, ME. Miller, DJ. Tyler, **RJ Triolo**, *12th Annual Conference of the International FES Society*, November 2007, Philadelphia, PA.
 131. "Selection of an Optimal Muscle Set for a 16-Channel Standing Functional Electrical Stimulation System, SJ Gartman, ML Audu, RF Kirsch, **RJ Triolo**, *12th Annual Conference of the International FES Society*, November 2007, Philadelphia, PA. PMID: 16847793. PMCID: PMC2668522
 132. "Wireless Implantable EMG Sensing Microsystem," Bradley Farnsworth, **Ronald Triolo**, Darrin Young, *Biomedical Engineering Society Meeting (BMES)*, Los Angeles, CA, September 2007.
 133. "Control System for Automatic Standing Balance using Functional Neuromuscular Stimulation (FNS) after Spinal Cord Injury (SCI)," Ravi Nataraj, Robert Kirsch, **Ronald Triolo**, *American Society of Biomechanics*, Stanford University, Palo Alto, CA, 2007.
 134. "Intraoperative Evaluation of the First Flat Interface Nerve Electrode for a Standing Neuroprosthesis," M.A. Schiefer, K.H. Polasek, G.C. Pinault, **R.J. Triolo**, D.J. Tyler. *4th International IEEE/EMBS Conference on Neural Engineering*, Kona Coast, Hawaii, 2007.
 135. "Intraoperative Evaluation of the Spiral Nerve Cuff Electrode for a Standing Neuroprosthetic," K.H. Polasek, M.A. Schiefer, G.C. Pinault, **R.J. Triolo**, D.J. Tyler. *4th International IEEE/EMBS Conference on Neural Engineering*, Kona Coast, Hawaii, 2007.
 136. "Surface EMG Analysis on Shoulder Muscle During Prolonged Wheelchair Propulsion," Y. Yang, A. Konntz, **R. Triolo**, R. Cooper, M. Boninger. *International Society of Biomechanics*, Taipei, Taiwan, July 2007.
 137. "Effects of Trunk Neuromuscular Electrical Stimulation on Seated Posture Stability and Function," K. Bogie, G. Nemunaitis, L. Boggs, J. Smith, G. Wu, **R. Triolo**, M. Boulet. *American Paraplegia Society*, 2007.
 138. "Hybrid Orthosis System with Variable Hip coupling Mechanism." C. To, R. Kobetic, **R. Triolo**. *28th IEEE EMBS Annual International Conference*, New York, NY, 2006. PMID: 17946991
 139. "Preliminary Evaluation of a Neural Prosthesis for Standing after Spinal Cord Injury with Four Contact Nerve-Cuff Electrodes for Quadriceps Stimulation." L. Fisher, M. Miller, S. Nogan, J. Davis, J. Anderson, L. Murray, D. Tyler, **R. Triolo**. *28th IEEE EMBS Annual International Conference*, New York, NY, 2006. PMID: 17947042
 140. "Models of Selective Stimulation with a Flat Interface Nerve Electrode for Standing Neuroprosthetic Systems." M. Schiefer, **R.J. Triolo**, D. Tyler. *28th IEEE EMBS Annual International Conference*, New York, NY, 2006. PMID: 17946642
 141. "Ambulation after Incomplete Spinal Cord Injury with Electromyogram-triggered Functional Electrical Stimulation." A. Dutta, R. Kobetic, **R. Triolo**. *28th IEEE E.MBS*

- Annual International Conference*, New York, NY, 2006. DOI: 10.1109/TBME.2007.902225. PMID: 18270018
142. “Selectively Stimulating the Human Femoral Nerve with a Flat Interface Nerve Electrode,” Schiefer M.A., **Triolo R.J.**, Tyler D.J. *37th NIH Neural Prosthesis Workshop*, Bethesda, MD, August 21–23, 2006.
 143. “Walking Mechanics after Training with an Implanted Functional Electrical Stimulation System for Incomplete Spinal Cord Injury.” E.C. Hardin, R. Kobetic, L. Murray, M. Corado-Ahmed, G. Pinault, S. Nogan, **R.J. Triolo**. *World Congress of Biomechanics*, Munich, Germany, 2006
 144. “Stability Analysis of Functional Electrical Stimulation (FES)-assisted Overground Gait in an Incomplete Spinal Cord Injured Subject.” A. Dutta, **R. Triolo**. *World Congress of Biomechanics*, Munich, Germany, 2006
 145. “Surface Electrical Stimulation of Trunk Musculature during Wheelchair Propulsion.” A.M. Koontz, Y.S. Yang, **R.J. Triolo**, J. Mercer, S. Fitzgerald, R. Cooper, M. Boninger. *Annual Rehabilitation Engineering Society of North America (RESNA) Conference*, Atlanta, GA 2006.
 146. “Walking after Incomplete Spinal Cord Injury with an Implanted Functional Electrical Stimulation System,” R. Kobetic, **RJ Triolo**, G Pinault, M Corado-Ahmed, L Murray, C Ho, E Hardin. *American Paraplegia Society*, Las Vegas, NV, 2006. PMID: 18247230. **Winner: Top 10 Poster Presentations**
 147. “Multicenter Evaluation of an Implanted Neuroprosthesis for Standing/Transfers,” LM Rohde-Murray, **RJ Triolo**, ME Miller, SN Bailey, JA Davis, JS Anderson. *American Paraplegia Society*, Las Vegas, Nevada, September 2006.
 148. “Variable Hip Reciprocating Mechanism for the Hybrid Orthosis System,” C. To, R. Kobetic, **R. Triolo**. *Department of Defense Military Health Research Forum (MHRF)*, San Juan, Puerto Rico, April 30– May 4, 2006.
 149. “Stability Analysis of Surface Electromyogram (sEMG)–Based Functional Electrical Stimulation (FES)–Assisted Overground Ambulation After Incomplete Spinal Cord Injury,” A. Dutta, **R. Triolo** – *International Conference on Chaos and Nonlinear Dynamics: Dynamics Days*. Baltimore, MD, Jan 4–7, 2006.
 150. “EMG-Triggered FES-Assisted Ambulation After Spinal Cord Injury,” A. Dutta, **R. Triolo**, - *ASME Summer Biomedical Engineering Conference*, Amelia Island FL, June 21–25, 2006.
 151. “State Space Analysis of AC Conduction Block Using a Hodgkin Huxley Model,” A. Dutta, **R. Triolo**. *ASME Summer Biomedical Engineering Conference*, Amelia Island, FL, June 21–25, 2006.
 152. “Impact of Muscle Spasms on Standing Balance of SCI Subjects – A Computer Simulation Study,” M.L. Audu, **R.J. Triolo**, R.F. Kirsch, *2005 Neural Interfaces Workshop*, September 2005, Bethesda, MD.
 153. “Volitional Surface EMG Based Control of FES-Assisted Ambulation After Incomplete Spinal Cord Injury – A Single Case Feasibility Study,” A. Dutta, **R.J. Triolo**. *2005 Neural Interfaces Workshop*, September 2005, Bethesda, MD.
 154. “Quantification of Human Sciatic Nerve Anatomy: Implications for Neural Prostheses Utilizing Nerve Cuff Electrodes,” K. Gustafson, Y. Grinberg, M. Stone, **R.J. Triolo**. *2005 Neural Interfaces Workshop*, September 2005, Bethesda, MD.

155. "Automatic Control of Standing Balance Following Spinal Cord Injury (SCI) Through Functional Neuromuscular Stimulation (FNS), R. Nataraj, **R.J. Triolo**, R.F. Kirsch, M.L. Audu, R. Kobetic. *2005 Neural Interfaces Workshop*, September 2005, Bethesda, MD.
156. "A Hydraulic Approach to the Development of a Variable Reciprocating Hip Mechanism for the Reciprocating Gait Orthosis," C. To, R. Kobetic, **R.J. Triolo**, R.F. Kirsch. *2005 Neural Interfaces Workshop*, September 2005, Bethesda, MD.
157. "Artificial Neural Network Prediction of Center of Pressure from Trunk Acceleration Inputs during Perturbed Human Bipedal Stance," R. Nataraj, **R. Triolo**, R. Kirsch, M. Audu, R. Kobetic. *XX Congress of the International Society of Biomechanics*, August 2005, Cleveland, OH.
158. "EMG Based Triggering and Modulation of Stimulation Patterns for FES Assisted Ambulation – A Conceptual Study," A. Dutta, R. Kobetic, **R. Triolo**. *XX Congress of the International Society of Biomechanics*, August 2005, Cleveland, OH.
159. "Effects of Trunk and Hip Stimulation During Bimanual Reaching After SCI," S. Nogan, **R. Triolo**, J. Sakai, *XX Congress of the International Society of Biomechanics*, August 2005, Cleveland, OH.
160. "Effects of Functional Electrical Stimulation on Manual Wheelchair Propulsion," **R. Triolo**, Y. Yang, A. Koontz, S. Nogan, M. Boninger, *XX Congress of the International Society of Biomechanics*, August 2005, Cleveland, OH.
161. "A Hydraulic Approach to the Development of a Variable Reciprocating Hip Mechanism for the Reciprocating Gait Orthosis," C. To, R. Kobetic, **R. Triolo**, R. Kirsch, *XX Congress of the International Society of Biomechanics*, August 2005, Cleveland, OH.
162. "Gait Biomechanics in an Obese Gastric Bypass Surgery Population: Preliminary Results," S.J. Nogan, M.M. Hooper, T.A. Stellato, B. Seitz, **R.J. Triolo**, R. Kobetic, *XX Congress of the International Society of Biomechanics*, August 2005, Cleveland, OH.
163. "EMG Activities of Trunk Muscles During Wheelchair Propulsion," A.M. Koontz, Y. Yang, **R.J. Triolo**, M.L. Boninger, J. Mercer, *XX Congress of the International Society of Biomechanics*, August 2005, Cleveland, OH.
164. "Facilitating Ambulation after Incomplete Spinal Cord Injury with Implanted FES System: A Case Report," R. Kobetic, **R.J. Triolo**, G. Pinault, L. Murray, M. Corado-Ahmet, E. Hardin, J. Sakai, S. Nogan, E.B. Marsolais, Chester Ho, *10th Annual Conference of the International Functional Electrical Stimulation Society*, July 2005, Montreal, Canada.
165. "Modeling Selective Stimulation with a FINE for Standing Neuroprosthetics," M.A. Schiefer, **R.J. Triolo**, D.M. Durand, D.J. Tyler. *10th Annual Conference of the International Functional Electrical Stimulation Society*, July 2005, Montreal, Canada.
166. "Modeling Selective Stimulation with a Flat Interface Nerve Electrode for Standing Neuroprosthetic Systems," M.A. Schiefer, **R.J. Triolo**, D.M. Durand, D.J. Tyler. *2nd International IEEE/EMBS Conference on Neural Engineering*, March 2005, Washington DC.
167. "Optimized Contact Location on a Flat Interface Nerve-Cuff Electrode for Use in Standing Neuroprosthetic Systems," M.A. Schiefer, **R.J. Triolo**, D.M. Durand, D.J. Tyler, *35th Annual NIH Neural Prosthesis Workshop*, November 2004, Bethesda, MD.
168. "Controller Design for Hands-Free Standing of SCI Subjects with FES," M.L. Audu, **R.J. Triolo**, R.F. Kirsch, *35th Annual NIH Neural Prosthesis Workshop*, November 2004, Bethesda, MD.

169. "Usage Patterns of an Implanted Neuroprosthesis for Exercise and Standing after Spinal Cord Injury." S.J. Nogan, **R.J. Triolo**, C. Bieri, L. Rohde, M. Miller, J. Davis, *9th Annual Conference of the International FES Society*, September 2004, Bournemouth, UK.
170. "Activation of the Trunk Muscles during Wheelchair Propulsion," Y. Yang, A. Koontz, S. Nogan, M.L. Boninger. **R Triolo**, R.A. Cooper. *9th Annual Conference of the International FES Society*, September 2004, Bournemouth, UK.
171. "Feasibility of a FES Powered Mechanical Gait Orthosis with Coordinated Joint Locking," C.S. To, R.F. Kirsch, R. Kobetic, **R.J. Triolo**, *Annual Conference of the International FES Society*, September 2004, Bournemouth, UK.
172. "The Feasibility of a Functional Neuromuscular Stimulation Powered Mechanical Gait Orthosis with Coordinated Joint Locking," C.S. To, R.F. Kirsch, R. Kobetic, **R.J. Triolo**, *IEEE Engineering in Medicine and Biology Society*, San Francisco, CA, September 2004. PMID: 17271186
173. "EMG Activity of Trunk Muscles During Wheelchair Propulsion," Y. Yang, A. Koontz, M.L. Boninger. **R Triolo**, R.A. Cooper. *American Society of Biomechanics*, 2004.
174. "Fascicular Anatomy of the Human Femoral Nerve: Implications for Standing Neural Prostheses Utilizing Nerve Cuff Electrodes," K.J. Gustafson, J. Neville, I. Syed, J.A. Davis, **R.J. Triolo**. *34th Annual NIH Neural Prosthesis Workshop*, Bethesda, MD, 2003.
175. "Standing with Functional Neuromuscular Stimulation: Effect of Foot Placement and Feedback Variables," J.J. Abbas, J.L. Finley, J.C. Gillette, **R.J. Triolo**, J.A. Resig. *IEEE Engineering in Medicine and Biology Conference (EMBS)*, Cancun, Mexico, 2003.
176. "Initial Results from a Multicenter Trial of an Implanted Neuroprosthesis for Standing and Transfers." **R Triolo**, JA Davis, C Bieri, M Miller, S Kukke, L Rohde, *Annual International FES Society Meeting*, Australia, 2003.
177. "A Model for Simulating Dynamic Control of Seated Trunk Posture Using Functional Electrical Stimulation." AJ Wilkenfeld, **RJ Triolo**, ML Audu, *Annual Rehabilitation Engineering Society of North America (RESNA) Conference*, Atlanta, GA, 2003.
178. "The Effects of Spinal Cord Injury on the Passive Properties of the Lower Extremities." K Amankwah, **R Triolo**, R Kirsch - *Annual Rehabilitation Engineering Society of North America (RESNA) Conference*, Atlanta, GA, 2003.
179. "Multicenter Clinical Evaluation of an Implanted Neuroprosthesis for Standing Transfers." **R Triolo**, J Davis, C Bieri, M Miller, S Kukke, L Rohde. American Paraplegia Society, September 2003. *Journal of Spinal Cord Medicine*, 2003.
180. "Feasibility of Controlling Seated Posture with Functional Electrical Stimulation." A Wilkenfeld, **R Triolo**. American Paraplegia Society, September 2003. *Journal of Spinal Cord Medicine*, 2003.
181. "User Perception and Follow-up Survey of a Standing Neuroprosthesis." S. Agarwal, **RJ Triolo**, JA Davis, R Kobetic, M Miller, S Kukke, C Bieri. American Paraplegia Society, September 2003. *Journal of Spinal Cord Medicine*, 2003.
182. "A Model for Simulating Dynamic Control of Seated Trunk Posture Using Functional Electrical Stimulation." A Wilkenfeld, **R Triolo**, M Audu, *American Spinal Injury Association (ASIA) Meeting*, Miami, FL, 2003
183. "Three-Dimensional Modeling of the Lower Extremity for the Study of Static Standing Postures in Functional Electrical Stimulation (FES)." M. Audu, R. Kirsch, **R. Triolo**. *IEEE Engineering in Medicine and Biology Conference (EMBS)*, Houston, TX, 2002, pp.2501-2502.

184. "Feedback Signals to Adjust and Control Standing Posture." J.L. Finley, J.C. Gillette, J.A. Riess, **R.J. Triolo** and J.J. Abbas. *IEEE Engineering in Medicine and Biology Conference (EMBS)*, Houston 2002, pp 2386-2387.
185. "Effects of Stimulated Trunk Extension on Seated Reach." S. Kukke, **R. Triolo**, J.A. Davis, *7th International FES Society Meeting*, Ljubljana, Slovenia, June 2002, pp. 250-252.
186. "Effect of Multi-channel Hybrid Orthosis Configuration on Walking in Paraplegia." E.B. Marsolais, R. Kobetic, D. Davy, R. Gaudio, S. Tashman, S. Nandurkar, **R. Triolo**, H.R. Lehneis, *7th International FES Society Meeting*, Ljubljana, Slovenia, June 2002, pp. 12-14.
187. "The Effects of Trunk Stimulation on Seated Workspace." S. Kukke, **R. Triolo**, J.A. Davis, *Annual Rehabilitation Engineering Society of North America (RESNA) Conference*, Minneapolis, MN, June 2002.
188. "Dynamic Pressure Relief for the Wheelchair User with Long-Term Therapeutic Neuromuscular Electrical Stimulation." K. Bogie, **R.J. Triolo**, J. Chae, *Annual Rehabilitation Engineering Society of North America (RESNA) Conference*, Minneapolis, MN, June 2002.
189. "The Effects of Trunk Stimulation on Seated Reach after SCI," S. Kukke, **R. Triolo**, J.A. Davis. Joint ASIA/IMSOP meeting, Vancouver BC, Canada, May 2002, *Journal of Spinal Cord Medicine*, 25(S1): S21, 2002.
190. "Dynamic Pressure Relief Using Therapeutic Neuromuscular Electrical Stimulation," K. Bogie, **R. Triolo**, John Chae. *Joint ASIA/IMSOP Meeting*, Vancouver BC, Canada, May 2002, pg. 59.
191. "The CWRU Hybrid Orthosis with Controllable Joints and Implanted FES for Walking," E.B. Marsolais, R. Kobetic, D. Davy, R. Gaudio, P. Adamczyk, **R. Triolo**, H.R. Lehneis. *Joint ASIA/IMSOP Meeting*, Vancouver BC, Canada, May 2002, pg. 32.
192. "The Effect of Electrically-Induced Trunk Extension on Seated Posture and Balance," S.N. Kukke, **R.J. Triolo**, J.P. Uhler, J.A. Davis. *Proceedings, 6th International FES Society Meeting*, Cleveland, Ohio, June 2001 pp. 34-36. **Honorable Mention, Robbie Robertson Student Scientific Paper Award, Buckeye Paralyzed Veterans of America**
193. "Describing Passive Joint Moments with a Nonlinear Viscoelastic Model," K. Amankwah, R.F. Kirsch, **R.J. Triolo**. *Proceedings, 6th International FES Society Meeting*, Cleveland, Ohio, June 2001 pp. 279-281.
194. "Adaptive Linearization of Agonist/Antagonist Muscle Systems," E.C. Hartman, **R.J. Triolo**, J.J. Abbas. *Proceedings, 6th International FES Society Meeting*, Cleveland, Ohio, June 2001 pp. 297-299.
195. "The Effect of Stimulated Trunk Extension on the Upright Body Weight Distribution While Standing with Functional Neuromuscular Stimulation," J.P. Uhler, **R.J. Triolo**, J.A. Davis. *Proceedings, 6th International FES Society Meeting*, Cleveland, Ohio, June 2001 pp. 65-67.
196. "Improving the Health of Paralyzed Tissue Using Electrical Stimulation," K.M. Bogie, **R.J. Triolo**, J. Chae. *Proceedings, 6th International FES Society Meeting*, Cleveland, Ohio, June 2001 pp. 163-165.
197. "Estimating the Ground Reaction Forces in Three-Dimensional Simulation of Standing Posture," M.L. Audu, R.F. Kirsch and **R.J. Triolo**. *Proceedings, 6th International FES Society Meeting*, Cleveland, Ohio, June 2001 pp. 265-267.
198. "Hybrid Orthosis with Controllable Hip and Knee Joints and Multichannel FES for Walking in Paraplegics," R. Kobetic, E.B. Marsolais, R.M. Kolacinski, R. Gaudio, S. Nandurkar, **R.**

- Triolo.** *Proceedings, 6th International FES Society Meeting*, Cleveland, Ohio, June 2001 pp. 74-76.
199. "The Effect of Stimulated Trunk Extension on the Upright Body Weight Distribution While Standing with Functional Neuromuscular Stimulation," J.P. Uhler, **R.J. Triolo**, J.A. Davis. *Journal of Spinal Cord Medicine*, 2001, vol. 24, pp. S7.
 200. "Performance of a Surgically Implanted Neuroprosthesis for Standing and Transfers," J.A. Davis, **R.J. Triolo**, J.P. Uhler, C. Bieri, D. Lissy, L. Rohde, N. Bhadra. *Proceedings, 5th International FES Society Meeting*, Aalborg, Denmark, pp 39-42.
 201. "A Biomechanical Model of the Spine and Trunk for Simulation and Control of Posture and Balance," **R.J. Triolo**, S. Suryanarayanan, S. Delp, S. Kukke, J. Uhler, W. Murray, N. Bhadra, R. Kirsch, J.A. Davis. *Proceedings, 2000 Annual Rehabilitation Engineering Society of North America (RESNA) Conference*, Orlando, FL, June 2000, pp. 202-204.
 202. "A Real-Time Simulation System to Evaluate User-Device Interaction: an Application for Development of FNS Control Systems," EC Hartman, J Riess, **RJ Triolo**, JJ Abbas. *Proceedings, 2000 Annual Rehabilitation Engineering Society of North America (RESNA) Conference*, Orlando, FL, June 2000, pp. 181-183.
 203. "Clinical Performance of a Surgically Implanted Neuroprosthesis for Exercise, Standing, Transfers and Upright Mobility," J.A. Davis, **R.J. Triolo**, J.P. Uhler, C. Bieri, N. Bhadra, R. Kobetic. American Spinal Injury Society Annual Meeting, Chicago, IL, April 2000. **Winner, Acorda Therapeutics Prize for Best Scientific Paper.** *Journal of Spinal Cord Medicine* Spring 2000; vol 23 pp. 3.
 204. "A Functional Performance Measure for Effort and Assistance Required for Sit-to-Stand and Standing Pivot Transfer Maneuvers," C. Bieri, **R.J. Triolo**, G.S. Danford, E. Steinfeld. American Spinal Injury Society Annual Meeting, Chicago, IL, April 2000. *Journal of Spinal Cord Medicine*. Spring 2000; vol 23 pp. 3.
 205. "Implantable FES Systems for Standing and Transfers," J.A. Davis, **R.J. Triolo**, J.P. Uhler, C. Bieri, N. Bhadra, R. Kobetic, D. Lissy, *Proceedings, 2nd National Meeting VA Rehabilitation Research & Development Service*, Washington DC, February 2000, pp. 138.
 206. "Performance of Implanted Epimysial Electrodes in the Lower Extremities of Individuals with Spinal Cord Injury," J.P. Uhler, **R.J. Triolo**, J.A. Davis. *Proceedings, 2nd National Meeting VA Rehabilitation Research & Development Service*, Washington DC, February 2000, pp. 121.
 207. "Maintenance of Tissue Health Through Long-Term Use of Neuromuscular Electrical Stimulation.," K. Bogie, **R.J. Triolo**, J. Chae. *Proceedings, 2nd National Meeting VA Rehabilitation Research & Development Service*, Washington DC, February 2000, pp. 128.
 208. "A Measure of Functional Performance for Sit-to-Stand and Standing Pivot Transfer Maneuvers," **R.J. Triolo**, C. Bieri, G.S. Danford, E. Steinfeld. *Proceedings, 2nd National Meeting VA Rehabilitation Research & Development Service*, Washington DC, February 2000, pp. 185.
 209. "A Clinical Interface for Control and Evaluation of FNS Systems," T. Vrabec, **R. Triolo**, J. Uhler, D. Lissy, C. Bieri. *2nd National Meeting VA Rehabilitation Research & Development Service*, Washington DC, February 2000, pp. 187.
 210. "Effects of System Nonlinearities on Posture Adjustments Using Functional Neuromuscular Stimulation," E. Hartman, **R.J. Triolo**, J. Abbas. *Proceedings, IEEE Engineering in Medicine and Biology Society*, Atlanta GA, October 1999, pp. 660-661.

211. "Task-Dependent Adjustments to Co-Stimulation Levels in Functional Neuromuscular Stimulation Systems," X. Zhang, **R.J. Triolo**, J.J. Abbas. *Proceedings, IEEE Engineering in Medicine and Biology Society*, Atlanta GA, October 1999, pp. 658-659.
212. "The Effects of Joint Loading on Passive Moment Measurements" K. Amankwah, **R.J. Triolo**, R. Kirsch, W. Zhao, *Proceedings, 1999 Annual Rehabilitation Engineering Society of North America (RESNA) Conference*, pp. 183-185, June 1999.
213. "Mobility Issues in Paraplegia," D.L. Brown-Triolo, **R.J. Triolo**, M.J. Roach, K. Nelson, P.H. Peckham. *Journal of Spinal Cord Medicine* 1999, 22(1): 29.
214. "A Bipedal, Closed-Chain Dynamic Model of the Human Lower Extremities and Pelvis for Simulation-Based Development of Standing and Mobility Neuroprostheses," W. Zhao, R.F. Kirsch, **R.J. Triolo**, S. Delp. *Proceedings, IEEE Engineering in Medicine and Biology Society*, Hong Kong, pp. 2605-2608, October 1998.
215. "The Effects of Co-Stimulation Map Parameters on FNS System Performance," X. Zhang, J.J. Abbas, **R.J. Triolo**, *Annals of Biomedical Engineering*, Cleveland OH, pp. S-133, October 1998.
216. "Improvement of the Tissue Viability of Paralyzed Muscles Using Neuromuscular Electrical Stimulation," K.M. Bogie, **R.J. Triolo**, J. Chae, *Annals of Biomedical Engineering*, Cleveland OH, pp. S-129, October 1998.
217. "Surgical Simulation of Tendon Transfers to Augment Lower Extremity Function with Functional Neuromuscular Stimulation," W. Zhao, **R.J. Triolo**, M. Wibowo, N. Bhadra. *Proceedings, Annual American Society of Mechanical Engineering Conference*, Anaheim, California, pp. 315-316, November 1998.
218. "Effects of joint loading on the passive moment at the ankle," K. Amankwah, **R.J. Triolo**, R. Kirsch, W. Zhao, *Proceedings, Annual American Society of Mechanical Engineering Conference*, Anaheim, California, pp. 405-406, November 1998.
219. "Surgically Implanted FNS System for Standing, Transfers and Upright Mobility after Spinal Cord Injury," J.A. Davis, **R.J. Triolo**, J.P. Uhlir, N. Bhadra, M. Sharma, E.B. Marsolais. *Proceedings, First National Meeting VA Rehabilitation Research & Development Service*, Washington DC, pp. 127, October 1998.
220. "Functional Neuromuscular Stimulation for Standing and Mobility after Spinal Cord Injury," C. Bieri, J. Davis, R. Kirsch, R. Kobetic, E. Marsolais, G. Polando, **R. Triolo**, J. Uhlir, W. Zhao. *Proceedings, First National Meeting VA Rehabilitation Research & Development Service*, Washington DC, pp. 161, October 1998.
221. "Improving the Tissue Viability of Paralyzed Muscles Using Neuromuscular Electrical Stimulation," K.M. Bogie, **R.J. Triolo**, J. Chae, P.H. Peckham, F. Frost. *Proceedings, First National Meeting VA Rehabilitation Research & Development Service*, Washington DC, pp. 162, October 1998.
222. "Development of a Three-Dimensional Biomechanical Model of Unassisted Standing via FNS," W. Zhao, **R.J. Triolo**, R.F. Kirsch. *Proceedings, First National Meeting VA Rehabilitation Research & Development Service*, Washington DC, pp. 166, October 1998.
223. "Effects of Conditioning on Passive Moment Measurements," K. Amankwah, R.F. Kirsch, **R.J. Triolo**. *Proceedings, First National Meeting VA Rehabilitation Research & Development Service*, Washington DC, pp. 167, October 1998.
224. "Assessing the Effect of Neuromuscular Electrical Stimulation on Pressure Distribution at the Seating Interface," K. Bogie, **R. Triolo**, J. Chae. *VI Emed Scientific Meeting*, Brisbane Australia, August 1998.

225. "Three-Dimensional Dynamic Modeling of Unassisted Standing of Individuals with Paraplegia by Functional Neuromuscular Stimulation," W. Zhao, **R.J. Triolo**, R.F. Kirsch, S. Delp. *Proceedings, Fifth International Symposium on the 3-D Analysis of Human Movement*, pp. 73-76, July 2-5, 1998.
226. "Modeling the Inverse Dynamics of Voluntary Arm Movements," K.N. Werner, **R.J. Triolo**, R.F. Kirsch, and W. Zhao. *Proceedings, Fifth International Symposium on the 3-D Analysis of Human Movement*, pp. 18-21, July 2-5, 1998.
227. "Estimating Postural Disturbances from Voluntary Arm Movement," K.N. Werner, **R.J. Triolo**, R.F. Kirsch, W. Zhao. *Proceedings, 1998 Annual Rehabilitation Engineering Society of North America (RESNA) Conference*, pp 375-377, June 1998. **Winner, Whitaker Student Scientific Paper Competition.**
228. "Performance of Implanted Epimysial Electrodes in the Lower Extremities of Individuals with Spinal Cord Injury," J.P. Uhler, **R.J. Triolo**, R. Kobetic, M. Wibowo. *Proceedings, 1998 Annual Rehabilitation Engineering Society of North America (RESNA) Conference*, pp. 223-225, June 1998.
229. "The Effect of Stimulated Hip Extensor Moment on The Loads Imposed on the Arms During Standing with FES," M.A. Wibowo, **R.J. Triolo**, J.P. Uhler, R. Kobetic. *Proceedings, 1998 Annual Rehabilitation Engineering Society of North America (RESNA) Conference*, pp. 384-366, June 1998. **Winner, Whitaker Student Scientific Paper Competition.**
230. "Shoulder Subluxation and Pain in Chronic Hemiplegia Treated by Intramuscular Electrical Stimulation," M.E. Walker, D.T. Yu, J. Chae, **R.J. Triolo**, Z.P. Fang. *Proceedings, 1998 Annual Rehabilitation Engineering Society of North America (RESNA) Conference*, pp. 217-219, June 1998.
231. "Selectivity of Intramuscular Stimulating Electrodes in the Lower Extremities," Q. Liu, **R.J. Triolo**. *Proceedings, 1998 Annual Rehabilitation Engineering Society of North America (RESNA) Conference*, pp. 235-237, June 1998.
232. "Therapeutic Application of Neuromuscular Electrical Stimulation to Improve Tissue Viability in Persons with Spinal Cord Injury," K. Bogie, **R.J. Triolo**, J. Chae. *Proceedings, 1998 Annual Rehabilitation Engineering Society of North America (RESNA) Conference*, pp. 241-243, June 1998.
233. "Initial Clinical Performance of a 16-Channel Implantable FNS System for Walking in Complete Paraplegia," C. Bieri, **R. Triolo**, R. Kobetic, G. Polando, J. Uhler, M. Sharma, E.B. Marsolais, J. Davis. *Journal of Spinal Cord Medicine* 21(2):181, 1998. **Third Place, American Spinal Injury Society (ASIA) Poster Competition.**
234. "A Wearable Controller for Clinical Studies Involving Multi-Implant FNS Systems," J. Buckett, **R. Triolo**, D. Ferencz, M. Katorgi, C. Bieri. *Journal of Spinal Cord Medicine* 21(2):179, 1998.
235. "Surgically Implanted FNS Systems for Standing, Transfers and Upright Mobility After Spinal Cord Injury," J.A. Davis, **R.J. Triolo**, J. Uhler, N. Bhadra, M. Sharma, E.B. Marsolais. *Journal of Spinal Cord Medicine* 21(2):180, 1998. **First Place, America Spinal Injury Society (ASIA) Poster Competition.**
236. "Performance Results of Epimysial Electrodes in the Lower Extremities of Individuals with Spinal Cord Injuries," J.P. Uhler, R. Kobetic, M.A. Wibowo, **R.J. Triolo**, G. Polando. *Journal of Spinal Cord Medicine* 21(2):172, 1998.
237. "Improving the Tissue Viability of Paralyzed Muscles using Neuromuscular Electrical Stimulation" K. Bogie, **R. Triolo**, J. Chae. *Journal of Spinal Cord Med.* 21(2):179, 1998.

238. "Using Selective Electrical Stimulation of the Quadriceps to Improve Standing in Paraplegia," J.P. Uhler, **R.J. Triolo**. *Assistive Technology* 9(2) 168, 1997
239. "Clinical Results from Implanted FNS Systems for Mobility after Spinal Cord Injury," **R.J. Triolo**, C. Bieri, J. Uhler, D. Ferencz, G. Polando, R. Kobetic, K. Ferguson, A. Young. *Proceedings, 2nd Annual Meeting of the International FES Society (IFESS)*, pp. 170-1, August 1997.
240. "Surgical Considerations for Implanting FNS Systems in the Lower Extremities," J.A. Davis, Jr., **R.J. Triolo**, N. Bhadra, J. Uhler, M. Sharma, E.B. Marsolais. *Proceedings, 2nd Annual Meeting of the International FES Society (IFESS)*, pp. 173-4, August 1997.
241. "A Comparison of Selective Quadriceps Stimulation to Hip Extensor Contributions During Standing in Paraplegia," J.P. Uhler, **R.J. Triolo**. *Proceedings, 2nd Annual Meeting of the International FES Society (IFESS)*, pp. 121-2, August 1997.
242. "Adaptive Mapping for the Control of Standing with Functional Neuromuscular Stimulation," E Stites, J. J. Abbas, **R.J. Triolo**. *Proceedings, 2nd Annual Meeting of the International FES Society (IFESS)*, pp. 83-4, August 1997.
243. "Mobility Issues and Priorities in Persons with SCI: A Qualitative Investigation," D.L. Brown-Triolo, **R.J. Triolo**, P.H. Peckham. *Proceedings, 2nd Annual Meeting of the International FES Society (IFESS)*, pp. 184-6, August 1997.
244. "Installation and Performance of a 16-Channel Implantable FES System for Upright Mobility," **R. Triolo**, D. Ferencz, C. Bieri, R. Kobetic, G. Polando, M. Sharma, E.B. Marsolais, J. Davis. *Proceedings, 1997 Annual Rehabilitation Engineering Society of North America (RESNA) Conference*, pp. 310-12, June 1997.
245. "Using Selective Electrical Stimulation of the Quadriceps to Improve Standing in Paraplegia." J. Uhler, **R. Triolo**. *Proceedings, 1997 Annual Rehabilitation Engineering Society of North America (RESNA) Conference*, pp. 313-5, June 1997. **Honorable Mention, Whitaker Student Scientific Paper Competition.**
246. "A Reusable, Self-adhesive Electrode for Intraoperative Muscle Stimulation in the Lower Extremity," J.D. Moss, N. Bhadra, **R.J. Triolo**, *Proceedings 1997 Annual Rehabilitation Engineering Society of North America (RESNA) Conference*, pp. 535-7, June 1997. **Winner, PVA Student Design Competition.**
247. "Facilitating Standing and Transfers in Incomplete Tetraplegia with Functional Neuromuscular Stimulation," **R.J. Triolo**, C. Bieri, G. Polando, R. Kobetic, A. Scheiner, E.B. Marsolais. *ASIA, Journal of Spinal Cord Medicine*. 19(2):168, 1996.
248. "The Effects of Growth on Motor Responses of Implanted Stimulating Electrodes," J.M. Akers, **R.J. Triolo**, R.R. Betz. Meeting of the *American Paraplegia Society*, 1996.
249. "Motor Responses to Implantable FES Electrodes in a Growing Limb," J.M. Akers, **R.J. Triolo**, R.R. Betz. *Proceedings of the International Conference of the IEEE Engineering in Medicine and Biology Society*, Montreal, Canada, 1995.
250. "Restoration of Standing Pivot Transfers for Quadriplegic Patients Using a Totally Implanted FNS System," **R.J. Triolo**, E.B. Marsolais. *Department of Veterans Affairs Rehabilitation R&D Progress Reports for 1994*, 32:89-90, June 1995.
251. "FNS Assisted Standing Pivot Transfers in Individuals with Incomplete Tetraplegia." **R.J. Triolo**, C. Bieri, G. Polando, R. Kobetic, A. Scheiner, E.B. Marsolais. *Proceedings, 18th Annual Conference, Rehabilitation Engineering Society of North America (RESNA)*, Vancouver Canada, pp. 390-2, June 1995.

252. "Inter-rater Reliability of the Functional Standing Test," **R.J. Triolo**, G. Eisenhower, T. Stabinski, D. Wormser, R. Craik. *Proceedings of the International Conference of the IEEE Engineering in Medicine and Biology Society*, Baltimore MD, pp. 470-1, November 1994.
253. "An Automated Method for Describing Muscle Fatigue," **R.J. Triolo** and M. Lawrence. *Proceedings the International Conference of the IEEE Engineering in Medicine and Biology Society*, Baltimore MD, pp. 337-8, November 1994.
254. "The Effects of Functional Neuromuscular Stimulation on the Joints of the Lower Extremity in Spinal Cord Injured Children," R.R. Betz, B. Boden, **R.J. Triolo**, E.R. Gardner, R.S. Fife. *Journal of the American Paraplegia Society*, 17(2):119, 1994.
255. "Functional Neuromuscular Stimulation: Functional Outcomes in Young People with Tetraplegia," M.J. Mulcahey, B.T. Smith, **R.J. Triolo**, R.R. Betz. *Journal of the American Paraplegia Society*, 16(2):142, 1993.
256. "Functional Neuromuscular Stimulation and Surgical Reconstruction of the Hand in Long-term Tetraplegia," M.J. Mulcahey, R.R. Betz, B.T. Smith, **R.J. Triolo**, A.A. Weiss, M.W. Keith. *Journal of the American Paraplegia Society*, 16(2):133, 1993.
257. "Experimental Evaluation of an Adaptive Feed Forward Controller for Use in Functional Neuromuscular Stimulation Systems," J. Abbas, **R.J. Triolo**. *Proceedings of the International Conference of the IEEE Engineering in Medicine and Biology Society*, pp. 1326-7, San Diego, CA, 1993.
258. "Contralateral Shoulder Movement as an FNS Control Source for C4 Tetraplegics: A Case Report," B. T. Smith, M.J. Mulcahey, **R.J. Triolo**, R.R. Betz. *Proceedings of the International Conference of the IEEE Engineering in Medicine and Biology Society*, pp. 1320-21, San Diego, CA, 1993.
259. "Characteristics of the Pediatric SCI Population Relative to the Application of FNS," **R.J. Triolo**, R.R. Betz, M.J. Mulcahey, E.R. Gardner. *Journal of the American Paraplegia Society*, 16(2):142, 1993.
260. "Functional Neuromuscular Stimulation: Functional Outcomes in Young People with Tetraplegia," M.J. Mulcahey, B.T. Smith, **R.J. Triolo**, R.R. Betz. *Journal of the American Paraplegia Society*, 16(2):142, 1993.
261. "Prolonged Standing for Children with Paraplegia by Means of Hybrid Orthosis: A Case Study," T. Houdayer, W. Freedman, **R.J. Triolo**, B. Andrews, R. Betz. *Proceedings of the 14th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, pp. 1349-51, 1992.
262. "The Effects of Functional Neuromuscular Stimulation on the Joints of the Lower Extremity in Spinal Cord Injured Children," R.R. Betz, C.L. Cole, **R.J. Triolo**, E.R. Gardner, J.C. Cohn, R.S. Fife. *Journal of the American Paraplegia Society*, 15(2): 74, April 1992.
263. "A Survey of the Pediatric Spinal Cord Injured Population on Attitudes Toward Standing," J.C. Cohn, M. Moynahan, **R.J. Triolo**, R.R. Betz. *The Journal of the American Paraplegia Society*, 15(2): 139, April 1992.
264. "A Survey of the Pediatric Spinal Cord Injured Population on Attitudes Toward Standing," J.C. Cohn, M. Moynahan, **R.J. Triolo**, R.R. Betz. *Neurology Report*, 15(4):11, April 1992.
265. "Bipolar Latissimus Dorsi Transposition and Functional Neuromuscular Stimulation to Restore Elbow Flexion in a C4 Quadriplegic with C5 Denervation," M.J. Mulcahey, R.R. Betz, B.T. Smith, **R.J. Triolo**, A.A. Weiss, M.W. Keith, P.H. Peckham, A. Mitra. *Journal of the American Paraplegia Society*, 15(2): 76, April 1992.

266. "A Standardized Evaluation of Standing Function for Children with Spinal Cord Injuries," **R.J. Triolo**, B. Reilley, M.J. Mulcahey, R.R. Betz, J.C. Cohn. Invited paper, *Proceedings, 13th Annual IEEE Engineering in Medicine and Biology Society*, pp. 1999-2001, Orlando, FL, 1991.
267. "Postural Control During One-Arm Support Standing: EMG Characterization," M. Moynahan, **R.J. Triolo**, R.R. Betz. Invited paper, *Proceedings, 13th Annual IEEE Engineering in Medicine and Biology Society*, pp. 1811-3, Orlando, FL, 1991.
268. "Pilot Study: Application of Intramuscular Stimulation to Upper Extremity Musculature of a Child with Spastic Quadriplegia, Cerebral Palsy," B.T. Smith, M.J. Mulcahey, **R.J. Triolo**, R.R. Betz. Invited paper, *Proceedings, 13th Annual IEEE Engineering in Medicine and Biology Society*, pp. 1814-6, Orlando, FL, 1991.
269. "The Effects of Functional Neuromuscular Stimulation on the Bone Mineral Content in the Lower Limbs of Spinal Cord Injured Children," R.R. Betz, **R.J. Triolo**, V.M. Hermida, M. Moynahan, E.R. Gardner, A. Mauer, S.D. Cook, J.T. Bennett. *The Journal of the American Paraplegia Society*, 14(2): 65-66, April 1991.
270. "Restoration of Hand Function in the C7 Spinal Cord Injured Child," M.J. Mulcahey, B.T. Smith, **R.J. Triolo**, R.R. Betz. *The Journal of the American Paraplegia Society*, 14(2):101, April 1991.
271. "Development and Standardization of an Evaluation for Standing Function in Children with Spinal Cord Injuries," **R.J. Triolo**, B. Reilley, M.J. Mulcahey, R.R. Betz, J. Cohn. *The Journal of the American Paraplegia Society*, 14(2): 101, April 1991.
272. "Training Tools for a Neuroprosthetic Hand System," B.T. Smith, M.J. Mulcahey, **R.J. Triolo**, R.R. Betz. *Proceedings, 14th Annual Conference, Rehabilitation Engineering Society of North America (RESNA)*, pp. 394-6, Kansas City, MO, 1991.
273. "Further Development of a Hybrid Orthosis for Prolonged Standing in Children with Complete Spinal Cord Injuries," **R.J. Triolo**, R. Barnett, B.J. Andrews. *Proceedings of the World Congress on Biomechanics*, La Jolla, CA, p. 330, August 1990.
274. "Agreement of EMG and Strength-Duration Tests in Determining a Lower Motor Neuron Lesion in Children with Spinal Cord Injuries," E.R. Gardner, T.M. Sweezy, **R.J. Triolo**, R.R. Betz. *American Physical Therapy Association Annual Conference*, Anaheim, CA, June 1990.
275. "Improvement of Hand Function in Children with Arthrogyrosis following Neuromuscular Stimulation (NMES) - A Preliminary Report," S. Weaver, E.R. Gardner, **R.J. Triolo**, R.R. Betz. *1990 Annual Meeting of the Association of Children's Prosthetic-Orthotic Clinics*, Valhalla, NY, June 6-9, 1990.
276. "Force-Velocity and Length-Tension Properties of Stimulated Human Quadriceps Muscle in Spinal Cord Injured Children," **R.J. Triolo**, R.R. Betz, D. Robinson. *Proceedings of 11th Annual IEEE Engineering in Medicine and Biology Conference*, Seattle, WA, p. 967-8, November 1989.
277. "Physiological Responses to FNS Exercise in Children with Spinal Cord Injuries," D. Robinson, **R.J. Triolo**, R. R. Betz. *Proceedings of 11th Annual IEEE Engineering in Medicine and Biology Conference*, Seattle, WA, p. 1498-9, November 1989.
278. "The Design of Output Stage Circuitry for Constant Current Neuromuscular Stimulation," A. Alm, R. Kobetic, **R.J. Triolo**, B. Smith, J. Buckett and G. Borges, *Proceedings of 11th Annual IEEE Engineering in Medicine and Biology Conference*, Seattle, WA, p. 1051-2, November 1989.

279. "Repeatability of Isometric Strength and Endurance of the Electrically Stimulated Quadriceps in Children with Spinal Cord Injuries," E.R. Gardner, **R.J. Triolo**, R.R. Betz. *Physical Therapy* 69(5): 369, June 1989.
280. "Effects of Stimulus Frequency on Contractile Properties of Paralyzed Muscle," S. Carroll, **R.J. Triolo**, H.J. Chizeck, R. Kobetic, E.B. Marsolais. *Proceedings of 10th Annual IEEE Engineering in Medicine and Biology Conference*, pp. 1936-7, New Orleans, LA, November 1988.
281. "The Eccentric Strength of Electrically Stimulated Paralyzed Muscle," **R.J. Triolo**, D. Robinson, E. Gardner, R.R. Betz. *Proceedings of 9th Annual IEEE Conference on Engineering in Medicine and Biology*, Boston, MA, November 1987.
282. "Experimental Demonstration of a Time Series Myoprocessor for the Control of an A/K Prosthesis," **R.J. Triolo**, G. Moskowitz. Invited paper, *Proceedings 8th Annual IEEE EMBS Conference*, Dallas-Fort Worth, TX, November 1986.
283. "Channel Selection for Multichannel Time Series Myoprocessors," **R.J. Triolo**, G. Moskowitz. *Proceedings 39th ACEMB Conference*, Baltimore, MD, September 1986.
284. "A 2D Force Feedback Monitor for Repeatable Muscle Contractions," **R.J. Triolo**, H. Hillstrom, G. Moskowitz. *Proceedings 39th ACEMB Conference*, Baltimore, MD, September 1986.
285. "A Multichannel Time Series Myoprocessor for Robust Classification of Limb Function and Estimation of Muscle Force," **R.J. Triolo**, G. Moskowitz. *IEEE Transactions on Biomedical Engineering*, Vol. BME-32, p. 875, October 1985.
286. "A Multichannel Time Series Myoprocessor for Robust Classification of Limb Function and Estimation of Muscle Force," **R.J. Triolo**, G. Moskowitz. *Proceedings 7th Annual IEEE EMBS Conference*, Chicago, IL, September 1985.
287. "Simultaneous Limb Function Identification and Muscle Force Estimation," **R.J. Triolo**, G. Moskowitz. Invited paper, *Proceedings 38th ACEMB*, Chicago, IL, 1985.
288. "Applications of Box-Jenkins Criteria to the Identification of Time Series Models of Lower Extremity EMG for the Control of Prostheses," **R.J. Triolo**, D. Nash, G. Moskowitz. *Proceedings of the 6th Annual Conference, IEEE Engineering in Medicine and Biology Society*, Los Angeles, CA, September 1984.
289. "Operating Range of Multichannel Time Series Myoprocessors," **R.J. Triolo**, G. Moskowitz. Invited paper, *Proceedings of the 37th Annual Conference on Engineering in Medicine and Biology*, Los Angeles, CA, September 1984.
290. "Variation of AR Parameters with Contraction Level," **R.J. Triolo**, G. Moskowitz. *Proceedings of the 36th Annual Conference on Engineering in Medicine and Biology*, Columbus, OH, September 1983.
291. "The Effects of AR Filter Design on Limb Function Classification," **R.J. Triolo**, G. Moskowitz. *Proceedings of the 36th Annual Conference on Engineering in Medicine and Biology*, Columbus, OH, September 1983.
292. "Autoregressive EMG Analysis and Prosthetic Control," **R.J. Triolo**, G. Moskowitz. *Proceedings of the 35th Annual Conference on Engineering in Medicine and Biology*, Philadelphia, PA, September 1982.

PROFESSIONAL ACTIVITIES:

- Reviewer, NINDS Special Emphasis Panel ZNS1 SRB-C (04): Translational Neural, Brain, and Pain Relief Devices, March 19-20, 2020.

- Programmatic Panel, Spinal Cord Research Program (SCIRP) of the Congressionally Directed Medical Research Program (CDMRP), FY 2019-2020.
- Chair, Research Career Scientist Panel(s), VA Rehabilitation Research & Development Service, 2017.
- NIH Study Section MOSS-V (15), SBIR/STTR, 2016.
- NIH Study Section ZEB1 OSR-D 01 S, NIBIB Quantum Program, 2016.
- Reviewer, *Lancet*, 2015.
- Program Committee and Session Chair, *Orthopaedic Rehabilitation Society*, Cleveland, OH October 24 & 25, 2014.
- Reviewer, *Expert Review of Medical Devices*, 2014, 2017.
- Reviewer, Research Career Scientist Panel, VA Rehabilitation Research & Development Service, February 2014–2016.
- Reviewer, Joint Warfighters Program, US Department of Defense, 2013.
- External IRB Reviewer, NIH Rehabilitation Medicine Department Scientific (RMD), 2013
- Reviewer, *Neuromodulation*, 2013.
- Reviewer, International Conference on Rehabilitation Robotics (ICORR), 2013.
- Reviewer, Career Development Award Panel, VA Rehabilitation Research & Development Service, February 2013.
- Grant Reviewer, Spinal Cord Injury Merit Review Panel, VA Rehabilitation Research & Development Service, August 2011, March 2012.
- Co-Chair, Neuromuscular Stimulation Session, IEEE Engineering in Medicine & Biology Conference (EMBC), Boston, MA, August 30 – September 3, 2011.
- Reviewer, *Journal of NeuroEngineering and Rehabilitation*, 2011.
- External Reviewer, Promotion & Tenure Committee, University of Pittsburgh (Department of Rehabilitation Science and Technology, School of Health and Rehabilitation Sciences), 2011.
- Reviewer, *Disability and Rehabilitation: Assistive Technology*, 2010.
- Reviewer, National Institute for General Medical Sciences (NIGMS) for Support of Competitive Research (SCORE) program study section ZGM1 MBRS-0 (NP), July 2010.
- Reviewer, National Institutes of Health study section 2ZRG1 MOSS-F, March 2010.
- Reviewer, *American Journal of Physical Medicine and Rehabilitation*, 2008.
- External reviewer – Committee on Promotions & Tenure, University of Pittsburgh, Pittsburgh, PA, 2008.
- Panelist and Reviewer, NSF RAPID (Research to Aid Persons with Disabilities) CAREER Program, National Science Foundation Alexandria, VA, October 3–4, 2007.
- External reviewer – Committee on Promotions & Tenure, Iowa State University, Ames, IA, 2007.
- Participant, National Academies Keck Futures Initiative Conference: Smart Prosthetics: Exploring Assistive Devices for the Body and Mind, Irvine, CA, November 9–11, 2006.
- Co-Chair, Rehabilitation Technology Session, American Spinal Injury Association (ASIA) annual meeting, Boston, MA, June 27, 2006.
- External reviewer – Committee on Promotions & Tenure, Worcester Polytechnic Institute, Worcester, MA, 2006.

- External reviewer - Department of Biomedical Engineering University of Alberta, Edmonton Canada, “Control Strategies and FES Paradigms for Restoring Standing and Stepping after SCI.” – Ph.D. Proposal, 2006.
- Reviewer, *Gait and Posture*, 2006.
- Reviewer, *Archives of Physical Medicine & Rehabilitation*, 2006.
- Organizing Committee: XXth Congress of the International Society of Biomechanics (ISB) & 20th American Society of Biomechanics (ASB), Cleveland, OH, August 2005.
- Chair, Functional Electrical Stimulation platform session, XXth Congress of the International Society of Biomechanics, Cleveland, OH, August 2005.
- Organizing Committee, 7th Symposium on Footwear Biomechanics (Technical Interest Group of the International Society of Biomechanics), Cleveland, OH, August 2005.
- Reviewer, International Conference on Robotics and Automation, Barcelona, Spain, 2005.
- Recipient, 2004 Maurice Saltzman Award for Clinical Excellence (with the Cleveland FES Center), Mt. Sinai Foundation.
- Function, Integration and Rehabilitation Science Subcommittee, Division of Scientific Review, National Institute of Child Health and Human Development, National Institutes of Health, 2004.
- External Reviewer, Motor Accidents Authority of New South Wales, Australia (Injury Management Project Grants), 2004.
- Chair, Stimulation Technology Session, International FES Society Annual Scientific Meeting, 2004.
- Reviewer, *IEEE Transactions on Robotics and Automation*, 2002.
- Board of Directors, International FES Society (IFESS) 2002–2005.
- Reviewer, *Neuromodulation*, 2002.
- Grant Reviewer/Consultant, Whitaker Foundation, 2002.
- Conference Chair, IFESS 2001: 6th Annual Scientific Meeting of the International Functional Electrical Stimulation Society, Cleveland Ohio, 2001.
- Guest Editor, *Journal of Rehabilitation Research & Development* special issue on Functional Electrical Stimulation, Winter 2001.
- Guest Editor, *Neuromodulation* special issue on Functional Electrical Stimulation, Fall 2001.
- Reviewer, *Neurorehabilitation and Neural Repair*, December 2000.
- Guest Editor, *Assistive Technology* special issue on Functional Electrical Stimulation, Spring, 2000.
- Editorial Board, *Journal of Rehabilitation Research and Development*, 1999 – present.
- Associate Editor, *IEEE Transactions on Rehabilitation Engineering*, 1999 – present.
- Special Scientific Grant Reviewer, Spinal Cord Research Foundation/Paralyzed Veterans of America, 1999–2000.
- External Reviewer, Louisiana Board of Regents Health Excellence Fund (HEF) program, 2000.
- Chair, Functional Electrical Stimulation Special Interest Group, Rehabilitation Engineering Society of North America (RESNA), 1999–2000.
- Chair, Functional Electrical Stimulation Scientific Session, Rehabilitation Engineering Society of North America (RESNA), Annual Meeting, June 1999.

- Chair, Functional Electrical Stimulation Special Interest Group, Rehabilitation Engineering Society of North America (RESNA), 1998–1999.
- Session Chair, Physiologic Motor Systems (Rehabilitation Engineering Track), Biomedical Engineering Society Meeting, Cleveland, OH, October 12, 1998.
- CWRU representative and exhibitor, Bioengineering Conference (BECON), National Institutes of Health, February 1998.
- Proposal Reviewer, *Spinal Cord Research Foundation*, 1998.
- Co-chair, Functional Electrical Stimulation Special Interest Group, Rehabilitation Engineering Society of North America (RESNA), 1997–1998.
- Ad hoc reviewer, *Proceedings, Rehabilitation Engineering Society of North America*, 1996.
- Organizing Committee, First Conference of the International FES Society. Cleveland, OH, 1995–1996.
- Organizing Committee, NIH Conference on Gait Analysis and Rehabilitation Medicine. Baltimore, MD, 1995–1996.
- Proposal Reviewer, *Ministry of Science and Technology, Republic of Slovenia*. 1995.
- Reviewer, *Medical and Biological Engineering & Computing*, 1995.
- Editorial Board, *Journal of Electromyography and Kinesiology*, 1994 – present.
- Program Organizing Committee, IEEE Engineering in Medicine and Biology Conference, Baltimore, MD. October 1994. Session Chair: Neuromuscular Systems and Fatigue.
- Program Organizing Committee, Engineering Foundation Conference - Neural Prostheses: Motor Systems IV. Deer Creek, OH. July 1994. Session Chair: Clinical Applications - Upper Extremity.
- Program Organizing Committee, IEEE Engineering in Medicine and Biology Conference, San Diego, CA. October 1993. Session Chair: Functional Electrical Stimulation.
- Special Faculty, Shriners Workshop on Human Motion Analysis, San Diego, CA. October 1993. Lecturer: “Standing and Walking with Functional Neuromuscular Stimulation: Technical and Clinical Challenges.”
- National Science Foundation (NSF) Study Section, Biological and Engineering Systems. June 1993.
- Assistant Editor, *IEEE Transactions on Rehabilitation Engineering*, 1993 – 1999.
- Proposal Reviewer, *National Science Foundation*, 1991.
- Reviewer, *IEEE Transactions on Biomedical Engineering*, 1990 – present.
- Program Organizing Committee, IEEE Engineering in Medicine and Biology Conference, Philadelphia, PA, October 1990. Session Chair: EMG.
- Special Faculty, Combined Sections of the American Physical Therapy Association Annual Meeting, Philadelphia, PA October 1990. Lecturer: “Upper and Lower Extremity Applications of Functional Neuromuscular Stimulation.”
- Reviewer, *CRC Press, Inc.*, 1986.

SERVICE ACTIVITIES:

- Clinical and Scientific Advisory Board (CSAB), “Spinal Root Stimulation for Restoration of Function in Lower-Limb Amputees,” NIH Brain Initiative project, University of Pittsburgh, L. Fisher Principal Investigator. 2017-2022.
- Advisory Board Member, DPT Program Development Committee, Case Western Reserve University School of Medicine 2017-2018.
- Committee on Biomedical Research, Case Western Reserve School of Medicine 2016–present.
- External Reviewer, Promotion & Tenure Committee, University of Michigan, 2018
- External Reviewer, Promotion & Tenure Committee, University of Pittsburgh, 2018.
- External Reviewer, Promotion & Tenure Committee, University of Pittsburgh, 2017.
- External Advisory Committee, Maryland Exercise and Robotics Center of Excellence (MERCE) 2016–2018.
- External Reviewer, Promotion & Tenure Committee, Case Western Reserve University School of Medicine. – 2015.
- Member, Cooperative Studies Program planning committee for project #CS2003, “Exoskeletal-Assisted Walking in Persons with SCI: Impact on Quality of Life. – 2014.
- Member, Faculty Search Committee, Department of Electrical Engineering and Computer Science, Case Western Reserve University, 2014.
- Member, VA Locomotor Workgroup, May 2013 – 2015.
- IEEE EMBS Technical Committee on Clinical Engineering, May 2012 – present
- Program/Steering Committee, NSF Workshop on Medical Device Innovation and Cyber-Physical Systems, Boston MA, November 2012.
- At-Large Representative, Faculty Council, CWRU School of Medicine, January 2011 – June 2013.
- Member, Field Research Advisory Committee (FRAC), VA Research & Development, US Department of Veterans Affairs, 2010–2013.
- Scientific Advisory Board, Pittsburgh Wheelchair and Associated Rehabilitation Engineering (WARE) Center of Excellence, Rehabilitation R&D Service, US Department of Veterans Affairs. 2008 – present.
- Steering Committee, Integrated Engineering and Rehabilitation Training, National Institutes of Health – NIBIB T32 (R. Kirsch, Director), July 2009 – June 2014.
- Member, Professional Standards Board (for benchmarking Hybrid Title 38 Occupations (Biomedical Engineering) within the VA system. Agent for the Under Secretary for Health.
- Executive Committee, NIDRR SCI Model System Center at MetroHealth Medical Center October 2006 – September 2011.
- Case Medical School Appointment, Promotion & Tenure Committee - MetroHealth System 2006 – 2009.
- Chair, Amputation, Prosthetics & Rehabilitation Engineering Review Panel, US Department of Veterans Affairs Rehabilitation R&D Service, February 2006.
- Steering Committee, Training Program in Musculoskeletal Research, National Institutes of Health - NIAMS T32 (E. Greenfield Ph.D. - Director), July 2006 – June 2011.

- Working Group, Clinical Translational Science Award (CTSA), National Institutes of Health (R. Ruddick M.D. and R. Horowitz M.D. - Directors), December 2005 – June 2006.
- Chair, Biomedical Engineering & Prosthetics Review Panel, US Department of Veterans Affairs Rehabilitation R&D Service, 2005.
- Dean's Search Committee for Assistant Chief of Staff for Research (ACOS-R), Louis Stokes Cleveland Department of Veterans Affairs Medical Center, 2005.
- Steering Committee, Neuromusculo-Skeletal Training Grant. CWRU Department of Orthopaedics. 2005.
- Member, White House/VA Commission on Emerging Technologies in Support of the New Freedom Initiative. October 2004.
- Chair, Rehabilitation Engineering & Prosthetics Review Panel, US Department of Veterans Affairs Rehabilitation R&D Service, 2004.
- Member, Research Committee, CWRU Department of Physical Medicine & Rehabilitation. April 2003 – present.
- Judge, St. Ann Grade School Science Fair (2003).
- Judge, Craftsman/NSTA Young Inventors Awards, Cleveland Municipal School District Instructional Technology, Science and Mathematics Education Office (2002, 2003).
- Board of Directors, "RePlay for Kids" (a nonprofit organization for the repair of therapeutic toys and assistive technologies for children with disabilities), May 2001 – present.
- Dean's Committee Representative, Research & Development Committee, Cleveland VA Medical Center, 1998–2003.
- Member, Executive Committee, Cleveland VA Center of Excellence in FES. 1998–present.
- Member, Research Committee, CWRU Department of Orthopaedics. June 1995 – present.
- Organizing Committee, CWRU Orthopaedics Research Day, June 22–23, 2001.
- CWRU Biomedical Engineering Research Day and Open House – Student Scientific Paper Judge, February 2001.
- Professional Advisory Committee, Matching Persons with Technology (MPT) Training and Evaluation Program (R43 HD38220-01A1 to The Institute for Matching Person & Technology, Inc.), October – December 2000.
- Organizing Committee, CWRU Orthopaedics Research Day, January 28–29, 2000.
- Interviewer, CWRU Biomedical Engineering Open House (screening prospective graduate students). February 1999.
- Member, Research Advisory Committee, Department of Physical Medicine and Rehabilitation, MetroHealth Medical Center. November 1997 – 1999.
- Member and coordinator, Institutional Review Board (IRB) Health Hill Hospital for Children, 1995 – 1999.
- Member, Community Advisory Board, FES Resource Guide, Cleveland FES Center. 1994–1995.
- Faculty Advisor, Case Engineering Service Group (student rehabilitation engineering organization). 1996.

EDUCATIONAL ACTIVITIES:

University Courses

- **EBME 328:** *Biomedical Engineering Projects*, Fall 2018, Spring 2019. Guided undergraduate BME major on study related to the biomechanics and caregiver effort during conventional and stimulation assisted transfers.
- **EBME 328:** *Biomedical Engineering Projects*, Fall 2017. Guided undergraduate BME major on study related to registering paraspinal electrode location to bony vertebral anatomy.
- **EBME 105:** *Introduction to Biomedical Engineering*, Fall 2017. Lectured on biomechanics and musculoskeletal modeling and their interactions with neuroprosthesis design and assessment.
- **USSO 2901:** *Understanding Patients: The Psychological and Societal Factors that Impact Behavior Regarding Health, Treatment, Care and Quality of Life.* Lectured and led interactive discussions with a class of approximately 15 undergraduate engineering and nursing students on neurological diseases and spinal cord injury, role of the family, impact of disability on quality of life, and clinical trials. Facilitated interactions with a research volunteer with spinal cord injury on understanding the challenges and impact of paralysis (Erin Lavik, course coordinator).
- **NYU G54.1017:** *Current Topics in Science, Health and Environmental Reporting* Lectured class of 13 journalism graduate students at New York University on topics related to powered exoskeletons, gait biomechanics, development of new assistive technologies, and disability rights and awareness. Led follow-up discussion sessions on technical, physiological and clinical aspects of short- and long-term sequelae of spinal cord injury, physical effects of immobility, neural engineering, and motor/sensory system neural prostheses.
- **EBME 328:** *Biomedical Engineering R&D Training*, Fall 2014, Spring 2015. Provided personal instruction and guidance to three individual undergraduate students on biomechanical measurement and analysis techniques including: operating laboratory instrumentation; performing calibration procedures; collecting, processing and interpreting data, developing and verifying computational algorithms; and communicating with peers and professionals. Specific projects and instruments included interfacing a stationary exercise cycle with implanted stimulation systems (RT300 Cycle Ergometer, Matlab xPC real-time control), design and calibration of an apparatus for intraoperative measurement of ankle moment (SolidWorks, rapid prototyping, digital communication), and characterization of motors with back drivable harmonic transmissions for robotic assistive devices (Biodex dynamometer, Matlab).
- **IBMS 500:** *On Being a Professional Scientist*, Spring 2013 – 2019 Facilitated small discussion groups on topics ranging from commercialization and intellectual property, human subject research, data safety, privacy, informed consent and protecting personal health information to the role of the scientist in the community including social media, communications and the political process (CWRU Department of Bioethics).
- **EBME 318/319:** *Biomedical Engineering Laboratory*, Fall 2013. Conceived, organized and conducted a laboratory experience for 10 undergraduate students on the *biomechanics of manual wheelchair propulsion* and the effects of stroke cadence and wheel resistance on activity of the shoulder muscles.

- **CWRU School of Law: Patent Prosecution 263**, Spring 2013.
Presented lectures on the need, underlying concept and operation of new rehabilitation aids. Guided discussions on their unique features in relation to conventional alternatives and the implications for intellectual property protection.
- **EBME 318/319: Biomedical Engineering Laboratory**, Spring 2011.
Conceived, organized and conducted a laboratory experience for 10 undergraduate students on the *biomechanics of manual wheelchair propulsion* and the effects of trunk stabilization on shoulder torque and mechanical efficiency.
- **EBME 440: Translational Research for the Biomedical Engineer**, Spring 2010.
Lectured on process for organizing and conducting clinical trials of neuroprosthetic technology.
- **EBME 105: Introduction to Biomedical Engineering**, Fall, 2008–2009.
Lectured on design considerations for neuroprostheses for standing and walking after paralysis to approximately 50 first year undergraduates. Reviewed fundamentals of excitation-contraction coupling and skeletal muscle biomechanics as they relate to the restoration of motor function via electrical activation of the peripheral nerves and provided a historical review of the work in the field before summarizing current research activities to restore standing balance, design and verify new neural interfaces, and facilitate ambulation and seated stability (Dr. Gerald Saidel, course coordinator).
- **Surgical Anatomy 515: Advanced Musculoskeletal Anatomy**, Fall 2006–2010.
Constructed and presented framing lecture on biomechanics of locomotion and human bipedal gait as core course faculty for this elective for 10 fourth year medical students, first year residents and students in the Advanced Masters in Applied Anatomy program in the Case Department of Anatomy. Organized and conducted laboratory experiences in kinematic and kinetic data capture and analysis of normal and pathological walking. (Dr. Shana Miskovsky, course coordinator)
- **CWRU USNA 239: The Musculoskeletal Machine**, Spring 2008.
Lectured on the biomechanical principles underlying the operation of neuroprostheses for standing, stepping and seated posture. Reviewed clinical manifestations of spinal cord injury, excitation of peripheral nerves, myoelectric control, mechanisms to regulate balance, gait and movement analysis and orthotic design. (Drs. Joe Mansour and Dwight Davy, course coordinators)
- **CWRU EBME 307: Advanced Biomechanical Prosthetic Systems**, Spring 2002 – 2008.
Lectured on human gait analysis, biomechanics of bipedal walking, and principles of lower extremity neuroprostheses. Organized and conducted two hands-on data collection and analysis experiences with VICON 700 motion capture system for assessing the effects of *velocity* on kinematics and kinetics of gait. (Dr. Robert Kirsch, course coordinator)
- **CWRU EBME 318: Biomedical Engineering Laboratory**, Fall 2007.
Conceived, organized and conducted a laboratory experience for 15 undergraduate students on the *biomechanical effects of prophylactic knee bracing* and risk factors that could predispose a brace wearer to injuries of the ankle syndesmotom ligament.
- **CWRU EBME 313: Biomedical Engineering Laboratory**, Fall 2004.
Conceived, organized and conducted laboratory experience for 12 undergraduate students on *myoelectric signal processing* for the control of assistive devices. Included signal acquisition, analog and digital filtering and relationship between processed EMG and

developed joint torque. Special attention was paid to the effects of stimulus artifact and amplifier blanking on signal-to-noise ratio.

- **CWRU EBME 314: Biomedical Engineering Laboratory**, Spring 2004.
Conceived, organized and conducted laboratory experience for 12 undergraduate students on *substitute sensory feedback* of center of pressure on standing balance. Involved LabView acquisition of COP data and modulation of amplitude, frequency and symmetry of an audio tone while standing with eyes open or closed. Students were introduced to just-noticeable-differences, and posturography in terms of COP path length, area and velocity metrics.
- **CWRU EBME 507: Motor Systems Neuroprostheses**, Spring 2003–2008.
Organized and taught series of lectures on lower extremity FES systems, bracing and gait analysis for graduate level course. (Dr. Robert Kirsch, course coordinator)
- **CWRU EBME 314: Biomedical Engineering Laboratory**, Spring 2003.
Conceived, organized and conducted laboratory experience for 15 undergraduate students on the *ergonomics of the seated operator* and coupling between hip and trunk motion during forward reaching in the sagittal plane. Involved kinematic data and EMG signal analysis. Participated in a second laboratory section this semester with Dr. Musa Audu dealing with standing posture and balance.
- **CWRU EBME 313: Biomedical Engineering Laboratory**, Fall 2001.
Conceived, organized and conducted 3-day laboratory experience for 15 students on the *effects of foot placement on balance* using force platform (COP) and EMG signal analysis.
- **CWRU EBME 307: Advanced Biomechanical Prosthetic Systems**, Spring 2000–2001.
Lectured on human gait analysis, biomechanics of bipedal walking, and principles of lower extremity neuroprostheses. Introduced concepts of kinematic and kinetic measurements. Organized and conducted hands-on data collection and analysis experiences with VICON 700 motion capture system for measuring *seated work volumes*. (Dr. Robert Kirsch, course coordinator)
- **CWRU REHAB 5001: Intro to Rehab Medicine**, Fall & Spring 1997–1999, 2001.
Conducted lecture and interactive demonstrations regarding rehabilitative and functional applications of electrical stimulation after spinal cord injury and stroke for exercise, standing and ambulation. (Dr. John Chae, course coordinator)
- **CWRU EBME 313: Biomedical Engineering Laboratory**, Fall 2000.
Conceived, organized and conducted 3-day laboratory experience for 12 students on the effects of *lumbar spine mobility* on seated workspace in three dimensions using quantitative motion capture instrumentation.
- **CWRU EBME 314: Biomedical Engineering Laboratory**, Spring 2000.
Organized, conducted and graded an undergraduate laboratory on the biomechanics of the lower extremities, specifically the measurement of *passive joint properties* and the effects of biarticular muscles.
- **CWRU EBME 105: Special Topic Report in Biomedical Engineering**, Fall 1999.
Advised undergraduate students preparing research papers on neuroprostheses and applications of functional neuromuscular stimulation. (Dr. P. Hunter Peckham, course coordinator)
- **CWRU EBME 507: Motor Systems Neuroprostheses**, Spring 1996 – 1999.

Organized and taught series of lectures on lower extremity FES systems, bracing and gait analysis for graduate level course. (Dr. Patrick Crago, course coordinator)

- **CWRU EBME 313: Biomedical Engineering Laboratory**, Fall 1998.
Organized, conducted and graded undergraduate laboratory dealing with *posturography* and biomechanics of human standing and balance.
- **CWRU EBME 313: Biomedical Engineering Laboratory**, Fall 1997.
Organized, instructed and moderated undergraduate laboratory on computer-aided modeling and *biomechanical simulations* for surgical decision making.
- **CWRU EBME 307: Biomechanical Prosthetic Systems**, Spring 1995–1998.
Developed and conducted new Senior-level undergraduate course of study in motor prosthesis design. Capstone course in undergraduate curriculum. Reviewed principles of assistive technology, clinical aspects of spinal cord injury and stroke, outcome assessment, regulatory procedures and related design criteria for devices to assist upper and lower extremity function. (Dr. P. Hunter Peckham, course coordinator)
- **CWRU EBME 313: Biomedical Engineering Laboratory**, Fall 1995.
Organized, instructed and moderated undergraduate laboratory on *contractile properties* of stimulated muscle.

Primary Research Advisor: Current Students or Projects in Progress

- S. Li (Ph.D.) Department of Biomedical Engineering, CWRU
- A. Friederich (Ph.D.) Department of Biomedical Engineering, CWRU
- R. Reyes (Ph.D.) Department of Biomedical Engineering, CWRU
- K. Gelenitis (Ph.D.) Department of Biomedical Engineering, CWRU
- N. Bean (B.S./M.S.) Department of Biomedical Engineering, CWRU

Primary Research Advisor: Completed Doctoral Dissertations

- B. Christie (Ph.D.), “Multisensory Integration of Lower-limb Somatosensory Neuroprostheses: From Psychophysics to Functionality,” Department of Biomedical Engineering, CWRU, 2019.
- M. Freeberg (M.D./Ph.D.), “Anatomically-Versatile Peripheral Nerve Electrodes Preserve Nerve Health, Recruit Selectively, and Stabilize Quickly,” Department of Biomedical Engineering, CWRU, 2017.
- S. Chang (Ph.D.), “A Comprehensive Strategy for Controlling the Hip and Knee with a Muscle-Driven Exoskeleton for Mobility after Paraplegia,” Department of Biomedical Engineering, CWRU, 2016.
- T. Bulea (Ph.D.), “A Variable Impedance Knee Mechanism for Improvement of FNS-Driven Gait,” Department of Biomedical Engineering, CWRU, 2012.
- L. Fisher (Ph.D.), “Improving Neuroprosthesis-Assisted Standing with Nerve-Based Stimulating Electrodes,” Department of Biomedical Engineering, CWRU, 2012.
- R. Nataraj (Ph.D.), “Feedback Control of Standing Balance using Functional Neuromuscular Stimulation Following Spinal Cord Injury,” Department of Biomedical Engineering, CWRU, 2011. *VA Rehabilitation R&D Pre-Doctoral Fellowship*
- C. To (Ph.D.), “Closed-Loop Control and Variable Constraint Mechanisms of a Hybrid Neuroprosthesis to Restore Gait After Spinal Cord Injury,” Department of Biomedical Engineering, CWRU, 2010.

- A. Dutta (Ph.D.), “Development of an Electromyogram-Based Controller for Functional Electrical Stimulation-Assisted Walking after Partial Paralysis,” Department of Biomedical Engineering, CWRU, 2009.
- M. Schiefer (Ph.D.), “Optimized Design of Neural Interfaces for Femoral Nerve Clinical Neuroprostheses: Anatomically-Based Modeling and Intraoperative Evaluation,” Department of Biomedical Engineering, CWRU, 2009 (Co-advisor with D. Tyler).
- K. Amankwah (Ph.D.), “The Impact of Lower Extremity Passive Joint Properties on Standing Function,” Department of Biomedical Engineering, CWRU, 2004.
VA Rehabilitation R&D Pre-Doctoral Fellowship, 2003

Primary Research Advisor: Completed Master’s Thesis Projects

- K. Cheng (B.S./M.S.) Department of Biomedical Engineering, CWRU, 2019
- C. Delianides (M.S.) Department of Biomedical Engineering, CWRU, 2019
- A. Bheemreddy (B.S./M.S.) Department of Biomedical Engineering, CWRU, 2019
- E. Dennis (M.S.) Department of Biomedical Engineering, CWRU, 2018
- K. Armstrong (M.S.) Department of Biomedical Engineering, CWRU, 2017.
- J. Murphy (M.S.) “Feasibility of Closed-loop Control for Righting Seated Posture after Spinal Cord Injury,” Department of Biomedical Engineering, CWRU, 2016.
- A. Crawford (M.S.) “Automatic Detection of Destabilizing Wheelchair Conditions for Modulating Actions of Neuroprostheses to Maintain Seated Posture,” Department of Biomedical Engineering, CWRU, 2015.
- K. Tepe (M.S.) “Selecting Muscles to Classify Manual Wheelchair Propulsion Phases Using EMG,” Department of Biomedical Engineering, CWRU, 2015.
- V. Everding (M.S.), “Stability Analysis of Human Walking,” Department of Biomedical Engineering, CWRU, 2009.
- L. Fisher (M.S.) “Evaluating Methods to Determine Selectivity of Implanted Neural Interfaces,” Department of Biomedical Engineering, CWRU 2008.
- T. Bulea (M.S.), “Design of a Permanent Magnet MR Fluid Controllable Knee Locking Orthosis,” Department of Biomedical Engineering, CWRU, 2007.
- S. Gartman (M.S.), “Selection of an Optimal Muscle Set for a 16-Channel Standing Functional Neuromuscular Stimulation System,” Department of Biomedical Engineering, CWRU, 2007.
- J. Zakrajsek (M.S.), “Development and Feasibility of Error Distribution Map for Center of Mass Controller for Automatic Control of Standing Balance with FNS,” Department of Biomedical Engineering, CWRU, 2004.
- D. Goldstein (M.S.), “Sensory Feedback for Balance in Standing Subjects,” Department of Biomedical Engineering, CWRU, 2004.
- C. To, “A Three-Dimensional Computer Model of the Hybrid Orthosis System”, Department of Biomedical Engineering, CWRU, 2004.
- B. Heilman, “Selection of an Optimal Muscle Set for a Standing Neuroprosthesis”, Department of Biomedical Engineering, CWRU, 2003.
- S. Kukke, “The Effects of Trunk Stimulation on Seated Workspace.” Master’s Thesis, Department of Biomedical Engineering, CWRU, 2002.

- J. Uhler, “Selective Electrical Stimulation of the Quadriceps to Improve Standing Function in Paraplegia.” Master’s Thesis, Department of Biomedical Engineering, CWRU, 1998. *Honorable Mention, 1997 Whitaker Student Paper Competition*
- M. Wibowo, “Selection and Activation of Hip Extensor Muscles for Standing with FNS.” Master’s Thesis, Department of Biomedical Engineering, CWRU, 1998. *Winner, 1998 Whitaker Student Paper Competition*
- K. Werner, “Modeling the Postural Disturbances Caused by Upper Extremity Movements.” Master’s Thesis, Department of Biomedical Engineering, CWRU, 1998. *Winner, 1998 Whitaker Student Paper Competition*
- M. Walker, “The Effects of Intramuscular Electrical Stimulation Treatment on Shoulder Subluxation, Pain, Motor Function, and Self-Care Skills in Chronic Hemiplegia.” Master’s Thesis, Department of Biomedical Engineering, CWRU, 1998.
- D. Wormser, G. Eisenhower & T. Stabinski. “Inter-rater Reliability of the Functional Standing Test.” Master’s Thesis, Department of Physical Therapy, Beaver College, Glenside, PA, 1993.
- T. Houdayer. “Prolonged Standing for Children with Paraplegia by Means of Hybrid Orthosis: A Case Study.” Master’s Thesis, Biomedical Engineering & Science Institute, Drexel University, Philadelphia, PA, 1993.
- B. Dodge & S. Sheehan. “The Functional Reach Test: Its Reliability and Utility with a Young Population.” Master’s Thesis, Department of Physical Therapy, Beaver College, Glenside, PA, 1992.
- N. Barnett & H. Lamite. “A Comparison of Energy Expenditure Between FNS Supported Standing and KAFO Supported Standing with Paraplegic Patients.” Master’s Thesis, Department of Physical Therapy, Beaver College, Glenside, PA, 1991.
- B. Billau. “Development and Standardization of an Evaluation for Function in Standing.” Master’s Thesis, Biomedical Engineering & Science Institute, Drexel University, Philadelphia, PA, 1990.
- S. Albright & M. Pettit. “The Effect of Electrical Stimulation on Upper Extremity ROM and Function in Children with Spastic CP.” Master’s Thesis, Department of Physical Therapy, Beaver College, Glenside, PA, 1989.

Student Examining Committees

- M. Connerton (M.S.), Department of Mechanical and Aerospace Engineering, CWRU 2019
- E. Graczyk (Ph.D.), Department of Biomedical Engineering, CWRU, 2018
- T. Eggers (Ph.D.), Department of Biomedical Engineering, CWRU, 2018
- J. Schofield (Ph.D.) University of Alberta, Edmonton, CA, 2017
- K. Angelino (M.S.) Department of Biomedical Engineering, CWRU 2015
- K. White (M.S.) Department of Biomedical Engineering, CWRU, 2012
- N. Kern (Ph.D.) Department of Mechanical and Aerospace Engineering, CWRU, 2012
- B. Wodlinger (Ph.D.) Department of Biomedical Engineering, CWRU, 2010
- A. Polinkovsky (M.S.) Department of Mechanical and Aerospace Engineering, CWRU, 2010
- B. Farnsworth (M.S.) Department of Electrical Engineering and Computer Science, CWRU, 2008

- L. Guevremont (Ph.D.) Department of Medical Science and Biomedical Engineering, University of Alberta, 2007
- T.J. Majewski (Ph.D.) Department of Mechanical and Aerospace Engineering, CWRU, 2007
- J. Lambrecht (M.S.) Department of Biomedical Engineering, CWRU, 2006
- Y. Yang (Ph.D.) Department of Rehabilitation Science, University of Pittsburgh, 2005
- M. Pierre (Ph.D.) Department of Biomedical Engineering, CWRU, 2005
- O. Papuga (M.S.) Department of Biomedical Engineering, CWRU, 2004
- P. Yoo (Ph.D.) Department of Biomedical Engineering, CWRU, 2004
- P. Spooner (Ph.D.) Department of Electrical and Electronic Engineering, University of Melbourne, Melbourne Australia, 2001
- E. Hartman (M.S.) Department of Biomedical Engineering, University of Kentucky, Lexington KY, 2000
- M. Tarler (Ph.D.) Department of Biomedical Engineering, CWRU, 1999
- S. Chang (Ph.D.) Department of Systems & Industrial Engineering, CWRU, 1997
- J. Abbas (M.S.) Department of Biomedical Engineering, CWRU, 1990

Post-Doctoral Fellows & Mentoring Activities

- J. Candiotti, 4/19 – present
- S. Hnat, 9/18 – present
- C. Shell, Ph.D. 4/16 – present
- B. Odle, 4/15 – 8/19
- N. Alibeji, Ph.D. 7/17 – 4/19
- H. Charkhkar, Ph.D. 8/15 – 12/18
- Nathan Makowski, Ph.D. – 10/14 – 10/19
Winner, NIH KL2 Fellowship
- Ravi Nataraj, Ph.D. – 2/13 – 1/15
- Dennis Bourbeau, Ph.D. – 10/13 – 9/15
Winner, VA Career Development Award Level 1
- Matthew Schiefer, Ph.D. – 5/09 – 4/15
Winner, Musculoskeletal Training Grant Post-Doctoral Fellowship
Winner, VA Career Development Award Levels 1&2
- Stephen Selkirk, M.D./Ph.D. – 8/10 – 7/13
Winner, VA Career Development Award Level II
- Katharine Polasek, Ph.D. – 4/08 – 7/10
Winner, VA Career Development Award Level I
- Joseph Potkay, Ph.D. – 1/06 – present
Winner, VA Career Development Award Level s I & II
- Jeffrey Capadona, Ph.D. – 7/05 – 2010
Winner, VA Career Development Award Levels I & II
- Elizabeth Hardin, Ph.D. – 7/04 – 2012
Winner, VA Career Development Award Levels I & II
- A. Wilkenfeld, CWRU School of Medicine, 9/00 – 2005
Winner, Crile Summer Research Fellowship;
NIH Post-Doctoral Fellowship (F32) Awardee (2002–2003)

- M. Audu, Ph.D. (2000–2001)
- N. Lan, Ph.D. (1999)
- K. Bogie, D.Phil. (1996–1999)
- W. Zhao, Ph.D. (1996–1999)
- J. Abbas, Ph.D. (1992–1993)
- M. Moynahan, M.S. - pre-doctoral fellowship (1990–1993)
- R. Barnett, Ph.D. (1989–1990)
- G. Phillips, Ph.D. (1989)

Senior Projects Advised

- J. Lee (B.S.), Department of Biomedical Engineering, CWRU 6/16–5/17
- A. Spalding, (B.S.), Department of Mechanical and Aerospace Engineering, CWRU, 1/14–7/14
- J. Alabek (B.S.), Department of Biomedical Engineering, CWRU 1/06–5/06
- Y. Martynyuk (B.S.), Department of Biomedical Engineering, CWRU 1/06–5/06
- C. Pulliam (B.S.), Department of Biomedical Engineering, CWRU 1/05–6/06
- D. Yungher (B.S.), Department of Biomedical Engineering, CWRU 6/04–5/05
- E. Wilson (B.S.), Department of Biomedical Engineering, CWRU 5/03–5/04
- M. Finlay (B.S.), Department of Mechanical and Aerospace Engineering, CWRU 1/02–5/02 “A Flexible Locking Thoracic-Lumbar-Sacral Orthosis (TLSO).”
- M. Liu (B.S.), Department of Biomedical Engineering, CWRU 9/97–12/97 “Selectivity of Intramuscular Stimulating Electrodes in the Lower Extremities.”
- J. Moss (B.S.), Department of Biomedical Engineering, CWRU 6/96–12/96 “A Reusable, Self-adhesive Electrode for Intraoperative Muscle Stimulation in the Lower Extremity.” *Winner, 1997 Paralyzed Veterans of America Student Design Competition.*
- K. Haycook (B.S.), Department of Biomedical Engineering, CWRU 9/96–12/96

Undergraduate Research Projects

- N. Bean, Department of Biomedical Engineering, CWRU 1/18 – present.
- J. Paximadas, Department of Biomedical Engineering, CWRU 5/17 - present
- T. Frolich, Department of Biomedical Engineering, CWRU, 5/15 – 5/16
- J. Lee, Department of Biomedical Engineering, CWRU, 1/15 – 5/16
- H. Wu, Department of Biomedical Engineering, CWRU, 1/15 – 9/15
- K. Armstrong, Department of Biomedical Engineering, CWRU, 1/14 – 5/15
- M. Lesieutre, Department of Mechanical and Aerospace Engineering, CWRU, 1/14–5/16
- R. Niman, Department of Biomedical Engineering, CWRU, 1/14–9/15
- A. Tong, Department of Biomedical Engineering, CWRU 9/14 – 5/15
- B. Nudelman, Department of Biomedical Engineering, CWRU, 1/14 – 5/15
- S. Guerra Nieto, Department of Biomedical Engineering, CWRU, 9/13 – 5/15
- A. Gupta, Department of Biomedical Engineering, CWRU, 1/14–5/14
- J. Gregor, Department of Biomedical Engineering, CWRU, 9/13 – 5/14
- A. Crawford, Department of Biomedical Engineering, CWRU, 9/13 – 3/14
- A. Basu, Department of Biomedical Engineering, CWRU, 5/13–9/13
- F. McPherson, Department of Biomedical Engineering, CWRU, 9/11–5/13

- A. Cepress, Department of Biomedical Engineering, CWRU, 5/12–9/12
- A. Raghu, Department of Biomedical Engineering, CWRU, 8/11–12/11
- K. Tepe, Department of Biomedical Engineering, CWRU 6/11 – 9/11
- A. Bonner, Department of Biomedical Engineering, CWRU 9/10 – 12/10
- P. Doshi, Department of Biomedical Engineering, CWRU 1/10 – 12/10
- J. Beverly, Department of Biomedical Engineering, CWRU 5/07–10/07
- D. Cifranick, Department of Biomedical Engineering, CWRU 6/06–12/06
- M. Quick, Department of Mechanical & Aerospace Engineering, CWRU 9/04–12/04
- M. Hathorn, Department of Biomedical Engineering, CWRU 6/04–9/04
- A. Mathewson, Department of Biomedical Engineering, CWRU 9/03–12/03
- K. Kemp, Department of Biomedical Engineering, CWRU 3/03–5/03
- S. Gartman, Department of Biomedical Engineering, CWRU 5/02–9/02
- K. Morris, Department of Biomedical Engineering, CWRU 1/02 – 5/02
- P. Shaw, Department of Biomedical Engineering, CWRU 1/01 – 12/02
- B. Bowers, Department of Biomedical Engineering, CWRU 1/00 – 5/01
- S. Gartman, Department of Biomedical Engineering, CWRU 9/99 – 12/99
- A. Ratzler, Department of Biomedical Engineering, CWRU 5/99 – 8/99

Medical Students Advised or Research Projects Supervised

- C. Lee, CWRU School of Medicine 5/18 – present
- J. Park, CWRU School of Medicine 5/18 – 8/18
- J. Yu, CWRU School of Medicine 5/18 – 8/18
- L. Mensis, CWRU School of Medicine, 9/13–2015
- M. Freeberg, CWRU School of Medicine, 2009
- J. Park, CWRU School of Medicine, 2007
- B. Masini, CWRU School of Medicine, 2004 – 2005
- J. Neville, CWRU School of Medicine, 2002 – 2005
- I. Sayed, CWRU School of Medicine, 2000 – 2003
Winner, Crile Summer Research Fellowship

Mentoring Activities

- Dennis Bourbeau, Ph.D. Co-mentor for research on neuroprostheses for control of micturition and defecation. 10/1/13 – 9/30/15. *Recipient, VA Career Development Award Level 1 (CDA-1)*
- Stephen Selkirk, M.D., Ph.D. Co-mentor for research on genetic therapies for multiple sclerosis. 2010 – 2019. *Recipient, VA Career Development Award Level II (CDA II)*
- Matthew Schiefer, Ph.D. Co-mentor for research in the design and evaluation of selective peripheral nerve interfaces. 5/09 – 5/18. *Recipient, VA Career Development Award Level 1 (CDA-1) and Level 2 (CDA-2)*
- Katharine Polasek, Ph.D. – Co-mentor for research in advanced prosthetics involving methods of providing natural sensation to amputees via interfaces with the nervous system. 4/08 – 7/10. *Recipient, VA Career Development Award, Level 1 (CDA-1)*
- Joseph Potkay, Ph.D. – Senior member of mentoring committee for research career development in medical applications of microelectrical/mechanical systems. 1/06 – 4/11. *Recipient, VA Career Development Award, Level 1 (CDA-1)*

- Jeffrey Capadona, Ph.D., *VA Associate Investigator Awardee*. Co-supervisor and mentor on research on rehabilitation applications of mechanically dynamic composite polymer materials. 7/05 –7/10. *Recipient, VA Career Development Award, Levels 1 & 2 (CDA-1, CDA-2)*
- Elizabeth Hardin, Ph.D., *VA Associate Investigator Awardee*. Supervisor & mentor on research directed toward facilitating ambulation after incomplete SCI or stroke. 7/04 – 6/12. *Recipient, VA Career Development Award, Levels 1 & 2 (CDA-1, CDA-2)*
- Guang Yang, M.D., Resident, Department of Physical Medicine & Rehabilitation, CWRU/MetroHealth Medical Center. Research project advisor: “The effects of trunk position on pulmonary function after SCI.” 6/04 – 12/05.
- Chester Ho, M.D., Spinal Cord Injury Service, LSVAMC, Department of Physical Medicine & Rehabilitation, CWRU. 1/03 – 6/04.
Recipient, VA Career Development Award

Training Grant Participation

- Training Program in Musculoskeletal Research, NIH/NIAMS 5T32AR007505-27. (E. Greenfield, Principal Investigator), \$1,868,005. May 2012 – April 2017.
- Integrated Engineering and Rehabilitation Training (Ruth L. Kirschstein NRSA Institutional Research Training Grants 2T32EB004314-11) (R. Kirsch, Principal Investigator) \$2,240,710. September 2009 – June 2014.
- Multidisciplinary Scholar Training Program (MSTP), NIH-NIGMS 5T32GM007250 (C. Harding, Principal Investigator), \$1,236,424. July 2004 – present.
- GAANN National Need Graduate Fellowships in Neural Engineering, DOE P200A-10411-02 (D. Durand, Principal Investigator), \$750,000. August 2009 – present.
- Post Resident Advanced Fellowship Program in Spinal Cord Injury Medicine (S. Selkirk, Principal Investigator). US Department of Veterans Affairs Office of Academic Affiliations (OAA). July 2011 – present.
- Training Program in Musculoskeletal Research, NIH/NIAMS 5T32AR007505-22E. (E. Greenfield, Principal Investigator), \$1,763,375. May 2007 – April 2012.
- Post Resident Advanced Fellowship Program in Spinal Cord Injury Medicine (CHK Ho & GH Creasey, Principal Investigators). US Department of Veterans Affairs Office of Academic Affiliations (OAA). July 2006 – 2010.
- Integrated Engineering and Rehabilitation Training Grant, NIH – NIBIB 9 T32 EB004314 (P. Crago, Principal Investigator), \$291,551. July 2004 – June 2009.

Invited Lectures, Seminars and Short Courses

- “Neural Stimulation for Ambulation after Paralysis,” NeuroRehabilitation 2018, Harvard Medical School, Waltham MA, June 15, 2018.
- “Recent Advances in Motor and Sensory Neuroprostheses”, OT-World (International Orthotic/Prosthetic Conference) Leipzig Germany, May 15 – 18, 2018
- “Neuro-assistive and Neuro-restorative Technologies” Citywide Physical Medicine & Rehabilitation Grand Rounds, Department of PM&R, Case Western Reserve University School of Medicine, January 22, 2018.

- “Neuroprostheses and Neurally Integrated Lower Limb Prosthetics & Orthotics,” 2017 Regional Lower Limb Prosthetic & Orthotic Rehabilitation Course, MetroHealth Medical Center, Cleveland, OH, April 29, 2017.
- “Options for Personal Mobility After Paralysis with Neuroprosthetic Technologies,” Current Concepts in Spinal Cord Injury Management, Penn State Rehabilitation Hospital, Hershey, PA, March 30, 2017.
- “Restoring Natural Sensation to Lower Limb Amputees: A DARPA HAPTIX Advanced Study,” HAPTIX Principal Investigator’s Meeting, Defense Advanced Research Program Administration, Arlington, VA, February 15, 2017.
- “Enhancing Standing, Walking and Seated Mobility with Implanted Neuroprostheses,” Department of Biomedical Engineering Seminar Series, Case Western Reserve University, Cleveland, OH, January 30, 2016.
- “Competition as a Model for Innovation for Assistive and Restorative Technologies,” Cleveland Clinic Lerner Research Institute (CC LRI) Quarterly Science Café, Cleveland, OH, November 16, 2016.
- “Implanted Neural Prostheses for Legged and Seated Mobility,” Advanced Technologies in Robotics for Rehabilitation and Reintegration, Clay Kaserne, United States Army Europe (USAREUR Mission Command Center, Wiesbaden, Germany, October 11, 2016.
- “Implanted Neuroprostheses: Technical and Clinical Challenges to Enhancing Standing, Walking and Seated Posture, Balance and Mobility after Paralysis.” Keynote address, Cybathlon Scientific Symposium, Swiss Federal Institute of Technology, Zurich, Switzerland, October 6, 2016.
- “Baby Steps: Neuroprosthetic Options for Standing, Walking and Seated Balance and Mobility after Paralysis,” University of Florida, Department of Biomedical Engineering, Gainesville, FL, April 11, 2016.
- “Implanted Neuro-Prostheses for Bipedal and Seated Mobility After Paralysis” in special session “Advancing Assistive Devices Through Global Olympic-Style Competition.” American Academy for the Advancement of Science, Washington, DC, February 15, 2016.
- “Neuromechanical Systems to Enhance Mobility After Paralysis: Neuroprostheses for Standing, Stepping and Seated Mobility.” North Carolina State University/University of North Carolina joint Rehabilitation Engineering Center Lecture Series, September 18, 2015.
- “Neuroprosthetic and Advanced Orthotic Applications for Lower Limb Weakness.” Northeast Ohio Regional Lower Limb Prosthetics and Orthotics Rehabilitation Course, MetroHealth Rehabilitation Institute of Ohio/Case Western Reserve University School of Medicine, May 2, 2015.
- “Design of Neuromechanical Systems to Enhance Mobility after Paralysis: A Story in Five Parts,” Department of Mechanical and Aerospace Engineering, Case Western Reserve University, April 24, 2015.
- “Design & Evaluation of Neuromechanical Systems to Enhance Mobility & Postural Stability after Paralysis,” University of Pittsburgh, Pittsburgh, PA, March 26, 2015.
- “Advanced Assistive Technologies for Personal Mobility after Paralysis, Cleveland Museum of Natural History, Cleveland, OH, November 1, 2014.

- “Neuroprostheses for the Paralyzed Trunk: Seated Posture, Balance, Reach & Manual Wheelchair Propulsion,” Orthopaedic Rehabilitation Society: Rehabilitation into the 21st Century, Cleveland, OH, October 24, 2014.
- “Neural Engineering: Communicating with the Nervous System,” State of the Science Symposia Series: Advanced Technology for Wounded, Injured and Ill Veterans. Department of Rehabilitation, Walter Reed National Military Medical Center, Uniformed Services University of the Health Sciences, Bethesda, MD, September 12, 2014.
- “Improving Mobility after Spinal Cord Injury: Neuroprosthetic and Neurotherapeutic Technologies,” Grand Rounds, Department of Neurology, Case Western Reserve University School of Medicine and the Neurological Institute of University Hospitals Case Medical Center, September 19, 2014.
- “Exploring Options for Personal Mobility after Paralysis via Neuroprosthetic Technology,” Department of Biomedical Engineering, Case Western Reserve University, June 17, 2014.
- “Functional Electrical Stimulation: An Update,” Annual Assembly of the American Academy of Physical Medicine & Rehabilitation, Washington, DC, October 2013.
- “Mobility Issues in SCI and MS,” PVA Summit, Orlando, FL, August 2013.
- “Reanimating the Lower Extremities,” No Barriers Summit, Telluride, CO, August 2013.
- “Electrical Interventions for Improving Seated Function after Spinal Cord Injury”, SCI/D In-service, LSCDVAMC, January 14, 2013.
- “Neuroprostheses for Upright Mobility and Seated Stability after SCI,” Grand Rounds, Department of Physical Medicine & Rehabilitation, MetroHealth Rehabilitation Institute of Ohio (MRIO), December 13, 2012.
- “Neuroprostheses for Upright Mobility and Seated Stability after Spinal Cord Injury,” Grand Rounds, Department of Clinical Neuroscience, University of Calgary School of Medicine, Calgary, CA, September 2012.
- “Animating the Extremities: Neuroprostheses for Standing, Stepping and Seated Function after Spinal Cord Injury,” International FES Society, Annual Scientific Meeting, Banff, Canada, September 2012.
- “Improving Seated Function by Controlling the Paralyzed Trunk with Electrical Stimulation,” Instructional Course, American Spinal Injury Association, Denver, CO, April 19–21, 2012.
- “Studies toward a Neuroprosthesis for Seated Posture and Balance,” FES Center Seminar, MetroHealth Medical Center, December 7, 2011.
- “Longitudinal Performance of an 8-Channel Neuroprosthesis for Standing,” FES Center Seminar, MetroHealth Medical Center, November 30, 2011.
- “Form and Function of the Peripheral Nerves and Spinal Cord, and Related Research,” Grand Rounds, CWRU Department of Orthopaedics, October 19, 2011.
- “Neuroprosthetic and Advanced Orthotic Applications for Lower Limb Weakness,” Regional Lower Limb Prosthetic & Orthotic Rehabilitation Course, MetroHealth Rehabilitation Institute of Ohio/Case Western Reserve University, April 9, 2011.
- “Re-envisioning the RGO: Developing Hybrid Orthotic-Electrical Approaches for Ambulation after Paralysis,” American Orthotic & Prosthetic Association Annual Meeting, Orlando, FL, October 2010.

- “Development of a Neuroprosthesis for Seated Posture and Balance,” Research Seminar Series, Louis Stokes Cleveland Department of Veterans Affairs Medical Center, May 6, 2010.
- “Controlling the Paralyzed Spine for Improved Seated Posture and Balance,” Grand Rounds, CWRU Department of Orthopaedics, April 21, 2010.
- “Improving Standing Function after Paralysis: Design and Application of Advanced Neuroprostheses,” Orthopaedic Research Seminar, CWRU Department of Orthopaedics, May 26, 2009.
- “Biomechanics of Bipedal Locomotion,” Grand Rounds, CWRU Department of Orthopaedics, August 26, 2009.
- “Spinal Mechanisms for Control of Movement,” Grand Rounds, CWRU Department of Orthopaedics, September 17, 2008.
- “Strategies in Applied Peripheral Nerve Stimulation,” Mini-workshop on Restoration of Movement via Peripheral Nerve Stimulation, Mathematical Biosciences Institute, Ohio State University, April 29, 2008.
- “Neuroprosthetic Treatment Options for Thoracic Spinal Cord Injury,” Department of Physical Medicine & Rehabilitation, MetroHealth Medical Center, April 10, 2008.
- "Neuroprostheses for facilitating ambulation, postural control and balance after paralysis," Department of Biomedical Engineering, Rutgers University East Brunswick, NJ, November 26, 2007.
- “Advances in Neuroprostheses for Balance, Standing and Ambulation,” Grand Rounds, CWRU Department of Orthopaedics, October 17, 2007.
- “Restoration of Trunk Stability using FES” 46th International Spinal Cord Society Annual Scientific Meeting/10th Norwegian Spinal Cord Society Congress (ISCoS/NoSCoS), Reykjavik, Iceland, June 27–July1, 2007.
- Restoration of Walking after Incomplete paralysis with FES”, 46th International Spinal Cord Society Annual Scientific Meeting/10th Norwegian Spinal Cord Society Congress (ISCoS/NoSCoS), Reykjavik, Iceland, June 27–July1, 2007.
- “Implanted Neuroprostheses for Standing and Walking after Spinal Cord Injury: The Case Western Reserve University Approach,” Centre for Neuroscience Seminar, University of Alberta, Edmonton, Canada, April 24, 2007.
- “Advanced Platform Technology Center: Overview and Examples of New Approaches to Rehabilitation,” Electrical Engineering and Computer Science (EECS) Colloquium, Case Western Reserve University, March 29, 2007.
- “Neuroprosthetic Interventions for Seated Balance and Bipedal Mobility after Spinal Cord Injury,” Distinguished Speakers in Bioengineering Lecture Series, Institute for Biomaterials and Biomedical Engineering, University of Toronto, Toronto, Canada, February 27, 2007.
- “Lower Extremity FES Treatment Options in SCI,” CWRU SOM PM&R Resident seminar, MetroHealth Medical Center, Cleveland, OH, October 12, 2006.
- “Advanced Platform Technology Center,” VA Rehabilitation R&D Center Directors Meeting, Palo Alto, CA, October 23–24, 2006.
- “FNS Approaches to Standing and Walking”, NIH Neural Interfaces Workshop, Bethesda, MD, August 22, 2006.

- “Spinal Mechanisms for Control of Movement,” Grand Rounds, CWRU Department of Orthopaedics, July 19, 2006.
- “Facilitating Ambulation after Incomplete SCI,” American Spinal Injury Association (ASIA), Boston, MA, June 27, 2006.
- “Biomechanics of Gait and Neurological Pathologies of the Foot and Ankle,” Grand Rounds, CWRU Department of Orthopaedics, June 7, 2006.
- “Advanced Platform Technology Center,” VA Rehabilitation R&D Center Directors Meeting, Palo Alto, CA, October 24–25, 2005.
- “Perspectives on Research Priorities for Neuroprostheses for Standing and Walking after Spinal Cord Injury,” Department of Defense, Integrated Research Team: Neuroprostheses for the Soldier and Society. Del Mar, California, October 10–12, 2005.
- “Lower Extremity FES Treatment Options in SCI”, CWRU SOM PM&R resident seminar, MetroHealth Medical Center, Cleveland, OH, May 12, 2005
- “Functional Electrical Stimulation for Standing and Walking”, First Annual Lexington Conference on Translational Neuroscience, University of Kentucky, Lexington, KY, April 29, 2005.
- “Implanted Neuroprostheses for Standing after Spinal Cord Injury,” University of Michigan Model Spinal Cord Injury Care System, Ann Arbor, MI, December 7, 2004.
- “Spinal Mechanisms for Control of Movement,” Grand Rounds, CWRU Department of Orthopaedics, July 21, 2004.
- “Advances in Neuromuscular Stimulation for the Lower limbs,” 2004 Spinal Cord Injury Conference, Long Beach, CA, 2004.
- “Neuroprostheses for Standing, Walking and Balance after Paralysis,” Grand Rounds, CWRU Department of Orthopaedics, March 17, 2004.
- “Lower Extremity FES Treatment Options in SCI”, CWRU SOM PM&R resident seminar, MetroHealth Medical Center, Cleveland, OH, December 4, 2003.
- “Strategies to Improve Transfers and Gait,” American Society of Neurorehabilitation Workshop: Scientific Basis of Neurorehabilitation for Spinal Cord Injury and Stroke, Cleveland, OH, August 9, 2003.
- “Standing, Transfers and Walking with FES after Spinal Cord Injury,” American Society of Neurorehabilitation Workshop: Scientific Basis of Neurorehabilitation for Spinal Cord Injury and Stroke, Cleveland, OH, August 9, 2003.
- “Gait and Human Motion Analysis,” American Society of Neurorehabilitation Workshop: Scientific Basis of Neurorehabilitation for Spinal Cord Injury and Stroke, Cleveland, OH, August 9, 2003.
- “Neuroprostheses for Standing, Walking and Seated Trunk Control after Spinal Cord Injury,” Combined CWRU-CCF Musculoskeletal Research Seminar, June 2003.
- “Controlling the Trunk for Standing and Seated Posture.” Invited lecture, Department of Rehabilitation Services, University Hospitals, Cleveland, OH. February 20, 2003.
- “Kinesiology: What You Need to Know About the Control of Movement.” Grand Rounds, CWRU Department of Orthopaedics, November 23, 2002.
- “Functional Electrical Stimulation for Standing and Walking after Spinal Cord Injury.” Invited lecture, ABC Traveling Fellowship program, Cleveland Clinic-Case Western Reserve University, May 10, 2002.

- “Neuroprostheses for Standing and Stepping” in short course entitled “New Techniques for Restoring Function” Joint ASIA/IMSOP Meeting, Vancouver BC, Canada, May 2002
- “The Effects of Trunk Stimulation on Seated Reach after SCI,” S. Kukke, **R. Triolo**, J.A. Davis. Joint ASIA/IMSOP Meeting, Vancouver BC, Canada, May 2002
- “Surgical Implantation of FES Hardware for Functional Standing in Persons with SCI.” Invited lecture, Kentucky Spinal Cord & Head Injury Research & Training Center: Clinical Advances in Neurorehabilitation Science Conference, Lexington, KY, September 27, 2001.
- “Standing Transfer and Walking after Spinal Cord Injury,” Invited lecture 2001 Charles Herndon Alumni Society, Cleveland, OH, June 22, 2001.
- “Standing Neuroprostheses: Where Do We Stand?” Invited lecture CWRU Applied Neural Control Research Day, June 2001.
- “A Surgically Implanted Lower Extremity Neuroprosthesis for Exercise, Standing and Transfers after Spinal Cord Injury.” Neurosurgery Grand Rounds, Jackson Memorial Hospital and the Miami Project to Cure Paralysis, Miami, FL, April 5, 2001.
- “Preliminary Performance of a Surgically Implanted Neuroprosthesis for Exercise, Standing and Transfers after Spinal Cord Injury.” Rehabilitation Engineering Center of Excellence on Aging with a Disability, Houston VA Medical Center, Houston, TX, December 1, 2000.
- “Lower Extremity Neuroprostheses.” American Academy of Physical Medicine and Rehabilitation, Instructional Course, San Francisco, CA November 4, 2000.
- “Unassisted Standing with Functional Neuromuscular Stimulation.” 31st Neural Prosthesis Workshop, National Institutes of Health, Bethesda, MD, October 26, 2000.
- “Preliminary Clinical Performance of an Implanted Neuroprosthesis for Standing and Mobility after Spinal Cord Injury.” Department of Anatomy and Neuroscience, University of Kentucky, Lexington, KY, October 12, 2000.
- “Neuroprostheses for Lower Extremity Function after Spinal Cord Injury.” Center for Ergonomics, Department of Industrial Engineering, University of Michigan, Ann Arbor, MI, September 19, 2000.
- “A Surgically Implanted Neuroprosthesis for Exercise, Standing and Transfers.” NeuroControl Corporation, Cleveland, OH, July 17, 2000.
- “A Surgically Implanted Neuroprosthesis for Exercise and Standing, Transfers.” Department of Physical Medicine and Rehabilitation, University of Kentucky and Cardinal Hill Rehabilitation Hospital, Lexington, KY, July 10, 2000.
- “A Surgically Implanted Neuroprosthesis for Exercise and Standing, Transfers.” Department of Orthopaedics, Medical College of Albany, Albany NY, June 1, 2000.
- “Implanted Lower Extremity Neuroprostheses.” Orthopaedic Rehabilitation Association instructional course, Cleveland, OH, May 12, 2000.
- “Lower Extremity Neuroprostheses: Fundamental Studies to Clinical Research.” Grand Rounds, CWRU Department of Orthopaedics, April 1, 2000.
- “Multicenter Clinical Trial of a Neuroprosthesis for Exercise, Standing and Transfers.” Rehabilitation Engineering Center Seminar, Department of Orthopaedics, MetroHealth Medical Center, March 15, 2000.

- “Measurement Issues in FES-Assisted Standing, Transfers and Ambulation.” 2nd National VA Rehabilitation Research R&D Meeting, Washington DC, February 21 & 22, 2000.
- “A Biomechanical Model of the Kinematics and Moment-Generating Capacity of the Spine and Trunk Musculature.” CWRU Department of Orthopaedics Research Day, January 28, 2000.
- “Performance of Implanted Epimysial Electrodes in the Lower Extremities of Individuals with Spinal Cord Injury.” CWRU Department of Orthopaedics Research Day, January 28, 2000.
- “Implantable FNS Systems for Standing Transfers.” CWRU Department of Orthopaedics Research Day, January 28, 2000.
- “Unassisted Standing by Functional Electrical Stimulation.” 30th Neural Prosthesis Workshop, National Institutes of Health, Bethesda, MD, October 13, 1999.
- “Lower Extremity Applications of FNS in Paraplegia and Incomplete Tetraplegia,” in a course entitled “Restoring Limb and Bladder Function with Electrical Stimulation” at the 1999 Meeting of the American Paraplegia Society (APS), Las Vegas, NV, September 1999.
- “Biomechanics of Human Quadriceps Muscles During Electrical Stimulation.” Rehabilitation Engineering Center Seminar, Department of Orthopaedics, MetroHealth Medical Center, June 2, 1999.
- “Unassisted Standing by Functional Electrical Stimulation,” CWRU Neuroprosthesis Seminar, CWRU, January 8, 1999.
- “Human Lumbosacral Spinal Cord Interprets Loading During Stepping.” Rehabilitation Engineering Center Seminar, Department of Orthopaedics, MetroHealth Medical Center. December 16, 1998.
- “Clinical Results from Implanted Lower Extremity Neuroprostheses,” Resident Research Conference, CWRU Department of Orthopaedics, November 11, 1998.
- “Unassisted Standing with Functional Neuromuscular Stimulation,” 29th Neural Prosthesis Workshop, National Institutes of Health, Bethesda MD, October 28–30, 1998.
- “Implantable Systems: What’s Going Right, and What’s Gone Wrong.” Rehabilitation Engineering Center Seminar, Department of Orthopaedics, MetroHealth Medical Center. June 4, 1998.
- “Maximizing Hip Extension Moment with Two Channels of Electrical Stimulation for FES-Induced Standing,” Poster Presentation, Annual Rehabilitation Engineering Society of North America (RESNA) Conference, June 1998.
- “Performance Results of Epimysial Electrodes in the Lower Extremities of Individuals with Spinal Cord Injuries,” American Spinal Injury Association (ASIA) annual meeting, Cleveland Ohio, April 21, 1998.
- “Future Directions: FES for Standing and Transfers,” in pre-conference course entitled “Restoring Limb & Bladder Function with Electrical Stimulation.” Presented at the 1998 meeting of the American Spinal Injury Association (ASIA) Cleveland, OH, April 19, 1998.
- “Lower Extremity FES,” Multidisciplinary Spine Conference, MetroHealth Medical Center, Cleveland, OH, April 17, 1998.

- “Implantable FNS Systems for Standing and Walking Mobility: Surgical Considerations,” Resident Research Conference, CWRU Department of Orthopaedics. November 1997.
- “Unassisted Standing with Functional Neuromuscular Stimulation,” 28th Neural Prosthesis Workshop, National Institutes of Health, Bethesda MD, October 1997.
- “Functional Electrical Stimulation for Ambulation after Spinal Cord Injury,” Living Well into the Next Century: An Educational Forum for People with Spinal Cord Injuries, MetroHealth Medical Center, October 7, 1997.
- “Clinical Results from Implanted FNS Systems for Mobility after Spinal Cord Injury,” 2nd Annual Meeting of the International FES Society (IFESS), August 1997.
- “Installation and Performance of a 16-Channel Implantable FES System for Upright Mobility,” 1997 Annual Rehabilitation Engineering Society of North America (RESNA) Conference, June 1997.
- “Implanted FNS Systems for Lower Extremity Mobility: Developing a Strategy,” 12th Annual Applied Neural Control Laboratory Research Day, CWRU. May 1997.
- “Unassisted Standing with Functional Neuromuscular Stimulation,” 27th Neural Prosthesis Workshop, National Institutes of Health, Bethesda MD, October 17, 1996.
- “Implanted FNS Systems for Standing and Transfers,” US Department of Veterans Affairs Research R&D Committee, Cleveland OH, October 15, 1996.
- “Research Directions in Lower Extremity Applications of Functional Neuromuscular Stimulation,” Research Retreat, Department of Orthopaedics, CWRU. October 1996.
- “Functional Electrical Stimulation Hand Grasp Neuroprostheses: Impact on Impairment, Disability and Handicap,” Department of Physical Therapy, Beaver College, Glenside, PA. April 1996.
- “Lower Extremity Applications of Functional Electrical Stimulation: Exercise, Standing, Transfers and Walking,” Department of Physical Therapy, Beaver College, Glenside, PA. April 1996.
- “FES Facilitated Standing Transfers in Low Tetraplegia: Fundamental Studies and Clinical Outcomes,” Grand Rounds, CWRU Department of Orthopaedics. March 1996.
- “The Effects of FNS on the Bones, Joints and Functional Independence of Adolescents with Spinal Cord Injuries,” Resident Research Conference, CWRU Department of Orthopaedics. November 1995.
- “Sit to Stand Motor Prostheses,” 10th Annual Applied Neural Control Research Day, CWRU. May 1995.
- “Challenges to Clinical Deployment of Upper Extremity Neuroprostheses,” Platform presentation, *Neural Prostheses: Motor Systems IV* Conference, Engineering Foundation, Deer Creek, OH. July 1994.
- “Lower Extremity Applications of FNS in Children with Spinal Cord Injuries,” Neural Prosthesis Seminar, CWRU. March 1994.
- “Standing and Walking with Functional Neuromuscular Stimulation: Technical and Clinical Challenges,” Special Workshop on Human Motion Analysis, IEEE Engineering in Medicine & Biology Society Meeting, San Diego, CA. October 1993
- “Functional Electrical Stimulation: Engineering and Clinical Aspects,” Rehabilitation Engineering Summer Internship Program, Department of Bioengineering, University of Pennsylvania, Philadelphia, PA. August 1993.

- “Clinical Considerations for the Application of Functional Electrical Stimulation in Children with Spinal Cord Injuries or Cerebral Palsy,” Grand Rounds, Kessler Institute for Rehabilitation, West Orange, NJ. July 1993.
- “Technology Transfer from Academic to Clinical Environments,” Platform presentation, *Neural Prosthesis: Motor Systems III* Conference, Engineering Foundation, Banff, Canada. July 1991.
- “Upper and Lower Extremity Applications of Functional Neuromuscular Stimulation,” Combined Sections of the American Physical Therapy Association Annual Meeting, Philadelphia, PA. October 1990.
- “Basic Electrophysiology,” Department of Physical Therapy, Beaver College, Glenside, PA. 1986, 1988–94.
- “Physical Principles of Electrical Stimulation,” Department of Physical Therapy, Beaver College, Glenside, PA. 1986, 1988–94.
- “Clinical Research: Principles and Design,” Department of Orthopaedics, Temple University, Philadelphia, PA. 1988–93.

Invention Disclosures

- Controller for Seated Stability after Paralysis (CWRU: 2017-3282; VA: 2017-465)
- System to Stabilize Wheelchair Users and Prevent Falls (CWRU: 2017-3281; VA: 2017-460)
- System to Improve Efficiency of Manual Wheelchair Propulsion (CWRU: 2017-3284)
- Non-Hydraulic Self-Leveling Walker (CWRU: 2017-3223)
- Packable, Collapsible Walker (CWRU: 2017-3203)
- Context Dependent Robotic Assistance for People with Disabilities (CWRU: 2018-3332; VA: 2017-580)
- Use of Accelerometer for Step Initiation with FES Gait System (2012-2229)
- Multilayer Microfabrication-Compatible Nerve Cuff Electrode with Regionally Patterned Stiffness (2012-2209)
- Self-Leveling Walker (2012-2198)
- Sum of Phase-Shifted Sinusoids Stimulation Paradigm (2012-2137)
- Electrotherapy for Low Back Pain (VA 12-025)
- Variable Impedance Polycentric Knee Mechanism with Controlled Damping (2011-2067)
- Power Assisted Orthosis with Hip-Knee Synergy (2011-2066)
- Methods of Gait Correction with Implanted FES Gait System (2010-1893)
- A Vertical Lift Walker for Sit-to-Stand Transition Assistance (2010-1846)
- Hydraulic Knee Constraint Mechanism (2009-1730)
- Self-Contained, Wireless, Micro-EEG and Micro-ECoG Systems (2009-1722)
- Smart, Instrumented Vascular Grafts (10-022)
- Wireless Implantable EMG Sensing Microsystem for Intelligent Control of Powered Prostheses (2009-1695)
- Natural Sensation for Lower Extremity Amputees with Multicontact Nerve Cuffs (2009-1690)
- Ankle Control via Selective Nerve Cuff electrodes (2009-1673)
- Variable Rigidity Trunk Corset (2009-1623)
- Integrated Surface Stimulation Device for Wound Therapy (2008-1600)
- Integrated Surface Stimulation Device for Pain Management (2008-1599)
- Split Collar Locking Mechanism for Use in Orthotics and Robotics (VHA #07-170)

- Controllable Joint Locking Mechanism for a Knee Orthosis (2009-1625)
- Permanent Magnet Magnetorheological Fluid Knee Brake Orthosis for a Hybrid Orthosis System (2006-1290)
- A Hybrid Orthosis with Variable Hip Coupling and Compliant Trunk Corset (2005-1107)
- User-Driven Automatic Control of Posture & Balance Based on Acceleration and Center of Pressure
- Automatic Control of Seated Posture & Sitting Balance with Electrical Stimulation
- A Slotted Epimysial Electrode
- Integrated Disposable Surface Stimulation System (2004-0966)
- Surgical Clamp for the Installation of an Epimysial Electrode
- Lower Extremity Control Unit (LECU)
- STRIDE (Software Technology Rehabilitating Injured & Disabled Extremities)
- Functional Performance Measure
- Rehabilitation and Evaluation Protocols for the Implantable FES Standing System
- Surgical Technique for Installing an 8-channel Neuroprosthesis for Standing

Patents & Patent Applications

- “Mechanical Self-Leveling Walker,” **Ronald Triolo**, Kevin Foglyano, US10500121 B2, issued 12/10/2019.
- “Wheelchair System with Motion Sensors and Neural Stimulation,” **Ronald Triolo**, Stephanie Bailey, Kevin Foglyano, Kiley Armstrong, Musa Audu, Application Number 16/056,631, published 2/7/2019 - PENDING
- “Hydraulic Stair Walker,” Kevin Foglyano, Lisa Lombardo, Stephanie Bailey, **Ronald Triolo**, ZL201830692100.4, issued 2/12/2019
- “Implantable Cuff and Method for Functional Electrical Stimulation and Monitoring,” Lee Fisher, Matthew Stone, Dustin Tyler, Daniel Tan, Matthew Schiefer, Natalie Brill, Michael Miller, **Ronald Triolo**, US9,603,538 B2, issued 3/28/17.
- “Delaying the Onset of Muscle Fatigue Associated with Functional Electrical Stimulation,” **Ronald Triolo**, Lee Fisher, Dustin Tyler, US 9,468,768 issued 10/18/2016; US 9,468,768 B2 issued 10/18/17.
- “A Vertical Lift Walker for Sit-to-Stand Transition Assistance,” **Ronald Triolo**, Thomas Bulea, US 9,351,898 issued 5/31/16
- “Self-Leveling Walker,” Ronald Triolo, Thomas Bulea, US 9,119,757 issued 9/1/2015.
- “Orthotic Brace,” Roger Quinn, Rudi Kobetic, **Ronald Triolo**, US 8,235,924 issued 8/7/12.

RESEARCH FUNDING HISTORY

PRINCIPAL INVESTIGATOR:

Title	Agency	Grant Number	Dates	Direct Costs	Indirect Costs	Total
Optimizing Warfighter Performance with Neurally Integrated Robotic Lower Limb Prostheses	DoD CDMRP	DM190766 GRANT-12986471	10/20-9/24	\$2,693,936	\$305,713	\$2,999,676
Neilsen Emergency Support Grant	C.H. Neilsen Foundation	Pending	5/20-4/21	\$10,000	0	\$10,000
Advanced Platform Technology Center of Excellence	VA (RR&D)	2 I50 RX001871-06	1/20-12/24	\$6,294,500	0	\$6,294,500
Training Program in Musculoskeletal Research	NIH (NIAMS)	2 T32 AR007505-31A1	5/19 – 4/24	\$2,483,177	\$121,270	\$2,604,447
Paul B. Magnuson Award	VA (RR&D)	N/A	10/19 – 9/22	\$150,000	0	\$150,000
Clinical Evaluation of a Self-Leveling Walker	State of Ohio (CTP)	CON2212321	3/19 – 2/20	\$38,000	0	\$38,000
Self-Leveling Walker (i-Corps)	OH Dept. of Higher Ed.	(i-Corps)	4/19 – 9/19	\$13,500	\$1,500	\$15,000
Automatic Control of Standing Balance and Gait with Implanted Neuroprostheses	NIH (NINDS)	NS040547	10/18 – 9/23	\$2,293,477	\$1,105,635	\$3,399,112
Natural Sensation of Foot-Floor Interactions for Transfemoral Amputees via Neural Stimulation	DoD CDMRP NIRRA	DM170381 GRANT12289947	7/18 - 6/22	\$2,021,092	\$476,145	\$2,497,237
Enhancing Seated Stability & Reaching After Spinal Cord Injury	NIH (NINDS)	NS101043	4/18 – 4/22	\$1,540,224	\$187,640	\$1,727,864
Self-Leveling Walker	Coulter-Case Translational Partnership	PY17-P505	12/17-9/18	\$21,739	\$3,261	\$25,000
Broadening Access to Overground Cycling Exercise	C.H. Neilsen Foundation	519168	10/31/17-10/30/18	\$90,900	\$9,090	\$99,990

Title	Agency	Grant Number	Dates	Direct Costs	Indirect Costs	Total
Integrated Control of Biological and Mechanical Power for Standing Balance and Gait Stability after Paralysis	NSF	1739800	9/17-9/21	\$814,565	\$184,831	\$999,396
Enhancing Seated Stability and Reaching after Spinal Cord Injury	DoD SCIRP	SCI160104	10/17-9/20	\$499,875	\$173,468	\$673,343
A Self-Leveling Walker for Safe Stair Climbing	VA Center of Innovation	N/A	3/17-9/17	\$121,352	0	\$121,352
Natural Sensation for Lower Limb Amputees	DARPA	N66001-15-C-4038	7/15-6/19	\$1,518,438	\$227,275	\$1,745,713
Advanced Platform Technology Center of Excellence	VA (RR&D)	1I50RX001871	1/15-12/19	\$4,500,000	0	\$4,500,000
Senior Research Career Scientist Award	VA (RR&D)	A9259-L	10/14-9/21	\$799,848	0	\$799,848
Enhancing Neuroprosthesis Performance with Nerve Cuff Electrodes	NIH (NIBIB)	R01 EB001889	4/14-3/19	\$1,752,046	\$849,857	\$2,601,903
Exploiting Selective Recruitment to Prolong Standing after SCI	VA (RR&D)	1I01RX001039	8/13-7/18	\$1,066,578	0	\$1,066,578
A Neuroprosthesis for Seated Posture and Balance	VA (RR&D)	1I01RX001204	7/13-6/17	\$1,078,144	0	\$1,078,144
Automatic Control of Standing Balance with Functional Neuromuscular Stimulation	NIH (NINDS)	R01 NS40547	7/11-6/18	\$1,632,284	\$734,406	\$2,366,690
A Hybrid Neuromechanical Ambulatory Assist System	DoD CDMRP	W81XWH-13-1-0099	5/13-4/15	\$398,982	\$103,736	\$502,718
Long-term Follow-up of Lower Extremity Neuroprostheses	VA (RR&D)	B7368R	4/12-3/14	\$476,009	0	\$476,009
Control of Seated Balance with Functional Neuromuscular Stimulation	DoD SCIRP	SC090230	10/10-9/13	\$722,115	\$187,750	\$909,865

Title	Agency	Grant Number	Dates	Direct Costs	Indirect Costs	Total
Advanced Platform Technology Center of Excellence	VA (RR&D)	A6791C	1/10 - 12/14	\$5,000,000	0	\$5,000,000
A Neuroprosthesis for Seated Posture and Balance	VA (RR&D)	B6406R	1/10-12/12	\$738,100	0	\$738,100
Senior Research Career Scientist Award	VA (RR&D)	A6037L	10/07-9/14	\$769,761	0	\$769,761
Enhancing Neuroprosthesis Performance with Nerve Cuff Electrodes	NIH (NIBIB)	R01 EB001889	9/07-6/12	\$1,434,547	\$745,070	\$2,179,617
Facilitating Ambulation after Incomplete SCI with FES	VA (RR&D)	B4451R	7/07 – 6/10	\$715,896	0	\$715,896
Automatic Control of Standing Balance with FES	NIH (NINDS)	R01 NS40547	4/06 - 3/10	\$900,000	\$483,143	\$1,383,143
A Hybrid Neuroprosthesis for Mobility after Paralysis from Spinal Cord Injuries	DoD (PRMRP)	PR043047	4/05 - 3/09	\$1,270,062	\$475,471	\$1,745,533
Rehabilitation Platform Technology Center of Excellence	VA (RR&D)	C3819C	1/05 - 12/10	\$4,500,000	0	\$4,500,000
Implantable Neuroprosthesis for Standing after SCI	FDA (OOPD)	FD-R-001244	10/04 – 9/07	\$788,823	\$297,880	\$1,086,703
Standing and Transfers after SCI with an Implanted Neuroprosthesis	VA (RR&D)	B3155R	4/04 – 3/07	\$741,900	0	\$741,900
Enhancing Neuroprosthesis Performance with Nerve Cuff Electrodes	NIH (NIBIB)	R01 EB01889	9/03 – 8/07	\$750,000	\$378,525	\$1,128,525
Research Career Scientist Award	VA (RR&D)	B2927S	10/02 – 9/07	\$310,000	0	\$310,000
Effects of Trunk Stimulation on Seated Wheelchair Function after SCI	VA (RR&D)	B3043-C	7/02-6/04	\$150,000	0	\$150,000
Pressure Sore Prevention Using Neuromuscular Electrical Stimulation	VA (RR&D)	B2371R	4/01 - 3/04	\$337,200	0	\$337,200
Collaborative Evaluation of an Implanted Neuroprosthesis for Standing Transfers	VA (RR&D)	E2668CA	4/01 – 3/03	\$100,000	0	\$100,000

Title	Agency	Grant Number	Dates	Direct Costs	Indirect Costs	Total
Automatic Control of Standing Balance with FES	NIH (NINDS)	R01 NS40547	9/00 - 7/03	\$600,000	\$259,925	\$859,925
Improving Tissue Viability of Paralyzed Muscle with NMES	SCRF (PVA)	SCRF 2074-01	3/00 - 2/01	\$37,275	\$2,982	\$40,257
Implantable FNS Systems for Standing after SCI	FDA (OOPD)	FD-R-001244	10/99 – 9/02	\$599,270	\$219,089	\$818,359
Exercise, Standing and Ambulation with Implanted FES Systems	VA (RR&D)	B682-4RA	1/99 - 12/01	\$1,088,723	0	\$1,088,723
Unassisted Standing by Functional Neuromuscular Stimulation	NIH (NINDS)	N01-NS-6-2351	10/96 - 9/01	\$805,889	\$259,838	\$1,065,727
Implantable FNS Systems for Standing Transfers	FDA (OOPD)	FD-R-001244	10/96 – 9/99	\$298,877	\$86,674	\$385,551
Improving Tissue Viability of Paralyzed Muscle Using NMES	SCRF (PVA)	SCRF 1695	3/97 - 5/99	\$100,289	\$8,023	\$108,312
Restoration of Standing Pivot Transfer for Quadriplegic Patients Using a Totally Implanted FNS System	VA (RR&D)	B743-RA	4/93 – 3/96	\$271,519	0	\$271,519
Total:				\$55,338,912	\$7,888,197	\$63,227,136

CO-INVESTIGATOR:

Title	Agency	Grant Number	Dates	Direct Costs	Indirect Costs	Total
Exoskeletal-Assisted Walking in Persons with SCI: Impact on Quality of Life	VA Cooperative Studies	CSP #2003	10/18-9/21	\$1,035,099	0	\$1,035,099
Toward Effective Pressure Ulcer Prevention: Development of a Flexible Implanted Stimulator	DoD SCIRP	Pending	10/17-9/20	\$1,409,238	\$366,212	\$1,775,450
Hybrid Neuroprosthesis with Power Assist for Walking after SCI	VA (RR&D)	1I01RX002275-01	7/16-6/20	\$1,087,516	0	\$1,087,516
Phase 2 Study of the NNPS for Grasp and Trunk Function in Cervical SCI	FDA OOPD	R01-FD-05409	9/18-8/19	\$91,779	\$53,691	\$145,470
Next-Generation High-Density Wireless Peripheral Nerve Stimulator	VA (RR&D)	1I01RX001178	1/14-12/16	\$824,010	0	\$824,010
Nerve Reshaping for Improved Electrode Selectivity	NIH NINDS	R01 NS032845	1/14 - 12/16	\$1,778,043	\$1,022,375	\$2,800,418
In-Line 32-Channel Connector for High-Density Implantable Medical Device	VA (RR&D)	1I21RX001361	10/13 – 9/15	\$199,913	0	\$199,913
Hybrid Neuroprosthesis with Variable Knee Control for Walking in SCI	VA (RR&D)	B0608R	1/13 – 12/15	\$797,328	0	\$797,328
Improving Walking after Paralysis	VA (RR&D)	B7692R	7/12 – 6/15	\$714,056	0	\$714,056
Multi-functional Neuroprosthetic System for Restoration of Motor Function	NIH NINDS	U01 NS069517	6/10 – 5/15	\$4,991,884	\$2,375,124	\$7,367,008
Control of a Hybrid Neuroprosthesis for Walking in SCI	VA (RR&D)	B6026R	7/08-9/11	\$572,300	0	\$572,300
Use of Implantable Microstimulators for Hip and Angle Control in Walking	VA (RR&D)	F4452R	1/07 - 12/10	\$601,700	0	\$601,700

Title	Agency	Grant Number	Dates	Direct Costs	Indirect Costs	Total
Prosthetic Arm Control Device for Amputees	DoD (TATRC)	W81XWH-07-2-0044	4/07-3/09	\$775,957	\$297,974	\$1,073,931
The NORSCIS SCI Model System: Development and Impact of New Technology on Disability	NIDRR US Department of Education	H133N060017	10/06-9/11	\$1,739,035	\$947,775	\$2,686,810
Ohio Neurostimulation and Neuromodulation Partnership: Biomedical Research Commercialization Program	OH Board of Regents	BRCP-06-22	7/06-6/09	\$7,567,485	\$756,748	\$8,324,233
Deep Brain Stimulation and Motor Performance in Parkinson's Patients	VA (RR&D)	B4061I	4/06 – 3/08	\$249,300	0	\$249,300
Development of a Networked Implantable Neuroprosthesis	NIH (NINDS)	R01 EB001940	3/05-2/10	\$5,494,494	\$2,912,082	\$8,406,576
Implanted Neuroprostheses for Exercise, Standing & Transfers	NY State Dept. of Health	C-018616	10/04 – 9/07	\$405,642	\$77,341	\$482,983
Design of Controllable Hip Joints for Hybrid Walking Orthoses	VA (RR&D)	B3463R	7/04 – 6/07	\$647,000	0	\$647,000
BIONS® for Improved Tissue Health and Pressure Sore Prevention	VA (RR&D)	B3259R	4/04 – 3/07	\$528,800	0	\$528,800
Realtime Interface for Implanted FNS Systems with StimGym II	customKYnetics, Inc. (SBIR subcontract)	R44HD039013	10/03-5/04	\$14,998	\$3,000	\$17,998
Ohio Neurostimulation and Neuromodulation Partnership: Biomedical Research Technology Transfer Program	OH Board of Regents	BRTT03-10	7/03 - 6/07	\$7,520,436	\$347,667	\$7,868,103
User-based Control of a FES-based Standing Neuroprosthesis	VA (RR&D)	B3025RA	7/03-6/06	\$637,656	0	\$637,656
Implantable FES for Control of the Extremities in Spinal Cord Injury	VA (RR&D)	B2725R	1/02 - 12/04	\$903,900	0	\$903,900

Title	Agency	Grant Number	Dates	Direct Costs	Indirect Costs	Total
Development of a Networked Implantable Neuroprosthesis	NIH (NINDS)	R01 EB001940	6/01 - 5/06	\$6,202,238	\$1,787,783	\$7,990,021
Design and Performance Considerations for Stimulating Nerve Cuff Electrodes in Motor System Neuroprostheses	CWRU PRI	N/A	1/01 – 12/01	\$50,000	0	\$50,000
Preparatory Adjustments for Improved Standing with FNS	NIH (NCHHD)	R01 HD38570	6/00 - 5/03	\$462,256	\$126,232	\$588,488
Individualizing the Design and Use of a FES-based Standing Neuroprosthesis	VA (RR&D)	B2105RC	4/00 – 3/03	\$449,716	0	\$449,716
Paraplegic Walking Made Practical with FNS & Orthoses	NIH (NINDS)	R01 NS-33287	6/98 – 5/01	\$821,075	\$431,854	\$1,252,929
FES Mobility in Paraplegia: RF-Controlled Implanted System	VA (RR&D)	B681-2RA	4/95 - 3/98	\$727,119	0	\$727,119
Paraplegic Walking Made Practical with FNS & Orthoses	NIH (NINDS)	R01 NS/HD 33287	4/94 - 5/97	\$782,269	\$406,780	\$1,189,049
Total:				\$50,082,242	\$11,912,638	\$61,994,880

GRANTS HELD PRIOR TO JOINING CASE FACULTY

1. “Development of Grasp and Upper Extremity Control with Functional Neuromuscular Stimulation in Children,” Shriners Hospitals, January 1992 – December 1994 (\$1,637,223) **Principal Investigator.**
2. “Functional Neuromuscular Stimulation of the Lower Extremities in Children with Spinal Cord Injuries,” Shriners Hospitals, January 1992 – December 1994 (\$3,757,476) **Principal Investigator.**
3. “Application of Artificial Neural Networks to Control FNS-Generated Walking in Children with Spinal Cord Injuries,” Shriners Hospitals, January 1992 – December 1994 (\$135,000) Co-Investigator with J. Abbas.
4. “Voluntary Postural Responses During FNS-Induced Standing,” Shriners Hospitals 1990–1993 (\$135,000) Co-Investigator with M. Moynahan.
5. “Development of Grasp and Upper Extremity Control with Functional Neuromuscular Stimulation in Children,” Shriners Hospitals 1989–1991 (\$335,306) **Principal Investigator.**
6. “Functional Neuromuscular Stimulation of the Lower Extremities in Children with Spinal Cord Injuries,” Shriners Hospitals 1989–1991 (\$1,598,792) **Principal Investigator.**
7. “Functional Neuromuscular Stimulation of the Lower Extremities in Children with Spinal Cord Injuries,” Shriners Hospitals 1986–1989 (\$1,101,190) Co-Investigator with R. Betz.
8. “Myoelectrically Controlled Above-Knee Prosthesis,” Veterans Administration, 1984–1986 (\$348,000) Co-Investigator with G. Moskowitz and H. Hillstrom.
9. “Adaptive Spatial Pattern Recognition and Time Series Signal Analysis Techniques for Myoelectric Control of Lower Limb Prostheses,” National Science Foundation 1984–1986 (\$333,000) Co-Investigator with G. Moskowitz and H. Hillstrom.