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## Ongoing Research Experiences:

**Project 1:** Long-term restoration of tactile and kinesthetic sensation in human amputees using electrical nerve stimulation delivered through multi-channel nerve cuff electrodes with percutaneous leads

<b>Associate Investigator</b>	35-40 hours/week	07/14-Present
<b>Post-doctoral Researcher</b>	40+ hours/week	07/12-06/14

### Accomplishments:

- Authored or co-authored 12 scientific papers in peer-reviewed journals and proceedings
- Gave 5 public platform presentations
- Authored or co-authored 2 book chapters appearing in Sunderland's Nerves and Nerve Injuries
- Authored 1 encyclopedia entry in the Encyclopedia of Computational Neuroscience
- Developed real-time closed-loop sensory feedback for prosthetic control
- Developed a novel method of nerve stimulation that transformed paresthesia ("tingling") into a natural sensation of pressure at multiple locations around the phantom hand
- Worked with the Technology Transfer Office to secure a patent for the novel stimulus waveform
- Worked with biomedical engineers and regulatory personnel to produce, submit, and receive approval on an FDA Investigational Device Exemption (IDE)
- Worked with regulatory experts on VA and DoD Investigational Review Board (IRB) approval
- Developed novel experiments that demonstrated that restored sensation increased object detection and object manipulation with a myoelectric prosthetic hand
- Served as a point-of-contact for collaborations with Medtronic for the development of input requirements documents for implantable multi-channel stimulators
- Worked with engineers, therapists, and clinicians to develop a battery of tests to assess the ability to restore natural sensation using electrical nerve stimulation and to assess the effects of sensory restoration on prosthetic control

### Supervisory Roles:

- Managed three graduate students, overseeing experimental design, experiments, and data analysis
- Managed six undergraduate students, overseeing data collation and analysis
- Managed one high school student, overseeing data collation and analysis

### Grants & Funding:

- Career Development Award – Level 1 (CDA-1), Department of Veterans Affairs (PI)
- HAPTIX, DARPA (Associate Investigator)

### Research Awards, Honors, & Recognitions:

- Featured on the cover of *Science Translational Medicine*
- Featured in various popular media

**Supervisor(s):** Holly Henry

**Research Advisor(s):** Dustin Tyler, PhD

*Advanced Platform Technology & Functional Electrical Stimulation Centers of Excellence*

**Project 2:** Develop an animal model of obstructive sleep apnea. Prevent obstructive sleep apnea using electrical stimulation of the hypoglossal nerve in acute experiments. Demonstrate successful outcomes without interfering with the sleep cycle in chronic experiments.

Co-Investigator 5-10 hours/week 09/15-Present

**Supervisory Roles:**

- Manage one post-doc, overseeing experimental design, experiments and data analysis.
- Manage one graduate student, overseeing experimental design, experiments, and data analysis.

**Grants & Funding:**

- SPiRE, Department of Veterans Affairs (Co-I)
- NIH, SPARC (Co-I)

**Supervisor(s):** Holly Henry

**Research Collaborator(s):** Kingman Strohl, MD, Michael Decker, PhD, Jonathan Baskin, MD, Michael Moore, PhD

*Advanced Platform Technology & Functional Electrical Stimulation Centers of Excellence  
Louis Stokes Cleveland Department of Veterans Affairs Medical Center (LSCDVAMC)  
Cleveland, OH, 44106*

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**Project 3:** Quantify vagal and splanchnic nerve response to stomach distension in chronically obese animals. Develop novel biomimetic stimulus waveforms using computer simulations. Evaluate the effect of stimulus on loss of excess body weight.

Principal Investigator 5-10 hours/week 06/15-Present

**Accomplishments:**

- Assembled and managed a research team consisting of biomedical engineers, a bariatric surgeon, and a bariatric surgical technician from three research institutions (Case Western Reserve University, LSCDVAMC, Cleveland Clinic)
- Used project-tracking software to set timelines and milestones (Gantt charts) for training, ordering supplies, conducting experiments, and publishing
- Coordinated study across two Institutional Animal Care and use Committees (IACUCs)
- Developed an automated system to control stomach distension while recording intragastric pressure and nerve responses
- Designed recording nerve cuff electrodes for the vagal and splanchnic nerves of obese rats
- Recorded vagal (parasympathetic) and greater splanchnic (sympathetic) neural responses to varied stomach volume and pressure during non-survival experiments

**Supervisory Roles:**

- Managed research technician
- Managed two independent budgets that funded different parts of the study

**Grants & Funding:**

- Pilot Grant, Veterans Affairs Foundation (PI)
- Clinical & Translational Science Collaborative Pilot Grant, Case Western Reserve University School of Medicine (PI)

**Supervisor(s):** Holly Henry

**Research Advisor(s):** Kenneth Gustafson, PhD, Stacy Brethauer, MD

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Cleveland, OH, 44106*

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**Project 4:** Design and analyze nerve cuff electrodes for use on lower extremity nerves to provide control over lower extremity musculature in individuals with impaired gait.

<b>Associate Investigator</b>	<5 hours/week	07/12-Present
<b>Post-doctoral Fellow</b>	40+ hours/week	05/09-06/12
<b>Graduate Research Assistant</b>	40+ hours/week	05/05-04/09
<b>Graduate Research Fellow</b>	40+ hours/week	12/03-08/05

**Accomplishments:**

- Authored or co-authored 21 scientific papers in peer-reviewed journals and proceedings (see Publications and Presentations)
- Gave 7 public platform presentations
- Developed and analyzed computer simulations to optimize neural interfaces for the femoral, sciatic, tibial, and peroneal nerves using histology-derived, 3D FEM models
- Conducted the largest probability analyses of neural population responses to electrical stimulation with  $\sim 6 \times 10^{12}$  neuron simulations using a combination of parallel computing on graphics processing units (GPUs) and high performance cluster computing
- Simulated expected mechanical outputs resulting from selective stimulation of the target nerves to guide novel nerve cuff electrode development
- Developed a 12-channel, mobile, intraoperative neuromodulation setup capable of real-time closed-loop control of nerve stimulation, representing a 200% increase over previously developed intraoperative systems
- Developed a graphical user interface (GUI) for the intraoperative setup
- Developed intraoperative protocols for nerve cuff degassing with an ultrasonic cleaner
- Developed intraoperative protocols for nerve cuff evaluation
- Coordinated experimental teams consisting of biomedical engineers, surgical nurses, surgeons, clinicians, therapists, and regulatory personnel
- Evaluated the ability of the CWRU spiral and flat interface nerve cuff electrode (FINE) to selectively recruit individual muscles or sets of muscles in the lower extremity through a series of acute intraoperative experiments requiring real-time collection and analysis of electromyograms (EMGs)
- Expanded nerve cuff electrode evaluation from EMG-based to moment/torque-based
- Worked with the Technology Transfer Office to secure a patent for a novel nerve cuff electrode
- Worked with biomedical engineers and regulatory personnel to produce, submit, and receive approval on an FDA Investigational Device Exemption (IDE)
- Developed input requirements documents for implantable multi-channel stimulators
- Used project-tracking software to set timelines and milestones (Gantt charts) for training, ordering supplies, conducting experiments, and publishing

**Supervisory Roles:**

- Managed an MD/PhD student, overseeing his experimental design, experiments, and data analysis
- Managed an MD/MS student, overseeing data collation and analysis
- Managed a PhD student, overseeing computer model design and analysis
- Managed an MS student, overseeing computer model design and analysis
- Managed an undergraduate student, overseeing the transition from EMG-based to moment/torque-based experiments

**Grants & Funding:**

- NIH-Funded Training Grant in Musculoskeletal Research, Department of Orthopaedics, Case Western Reserve University (PI)
- Equipment Grant, Department of Veterans Affairs (PI)
- Innovative Incentives in Technology Grant, Ohio 3<sup>rd</sup> Frontier (Graduate Student)
- Graduate Assistance in Areas of National Need (GAANN) Fellowship, Department of Education (Graduate Student)

**Research Awards, Honors, & Recognitions:**

- 2 best oral research presentations
- 8 research poster awards
- 2 invitations to Google's SciFoo "un-conference"
- 1 conference travel award
- Selected for the *Journal of Neural Engineering's* 2010 Highlights (#4 of the top 10 articles of 2010)
- Featured on the cover of *IEEE Transactions on Neural Systems and Rehabilitation Engineering*
- Featured in various popular media

**Supervisor(s):** Holly Henry, Ed Greenfield, PhD, Dustin Tyler, PhD, Ronald Triolo, PhD

**Research Advisor(s):** Dustin Tyler, PhD, Ronald Triolo, PhD, Dominique Durand, PhD, Gilles Pinault, MD, Kenneth Gustafson, PhD

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Louis Stokes Cleveland Department of Veterans Affairs Medical Center (LSCDVAMC)  
Cleveland, OH, 44106*

*Department of Biomedical Engineering, Department of Orthopaedics  
Case Western Reserve University  
Cleveland, OH, 44106*

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**Other Projects:** Confidential and varied by request

**Consulting Investigator**

As Needed

08/11-Present

**Accomplishments:**

- Established private consulting company providing expertise in neuromodulation, computer simulations of neural responses to electrical stimulation and interpretation of those simulations to guide neural interface development
- Have consulted for major medical device manufactures as well as smaller start-up companies (details restricted by Non-Disclosure Agreements)
- Provided rapid modeling solutions to guide product development

- Provided insights that allowed manufactures to assess multiple potential neural interface designs and choose the optimal solution.

*SimNeurix, LLC  
Cleveland, OH, 44120*

### Upcoming Research Experiences

**Project 5:** Development of a technique for selective stimulation of the recurrent laryngeal nerve to control vocal fold closure and prevent aspiration in post-stroke individuals.

<b>Co-Investigator</b>	TBD hours/week	Est. Start: 08/16
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**Project 6:** Assessment of time-variant stimulus waveforms for the reduction of chronic pain during spinal cord stimulation.

<b>Co-Investigator</b>	TBD hours/week	Est. Start: 10/16
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### Completed Research Experiences

**Project:** Develop and analyze a model of excitation of retinal ganglion cells during epiretinal stimulation.

<b>Graduate Research Fellow</b>	40+ hours/week	08/01-12/03
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**Accomplishments:**

- Authored or co-authored 4 scientific paper in peer-reviewed journals and proceedings (see Publications and Presentations)
- Gave 1 public platform presentation
- Designed stimulus waveforms that were selective either for the axons of passage or the bending axons of retinal ganglion cells
- Worked with the Technology Transfer Office to secure a patent for a novel stimulus waveform

**Grants & Funding:**

- Graduate Assistance in Areas of National Need (GAANN) Fellowship, Department of Education (Graduate Student)

**Research Awards, Honors, & Recognitions:**

- 1 conference travel award

**Supervisor(s):** Warren Grill, PhD

**Research Advisor(s):** Warren Grill, PhD, Dominique Durand, PhD, Dimitri Kourennyi, PhD

*Department of Biomedical Engineering  
Case Western Reserve University  
Cleveland, OH, 44106*

**Project:** Develop a LabView algorithm to account for lens aberration for use in an automated system using tunable (Free Electron) laser for brain tumor ablation

**Undergraduate Research Fellow** 10 hours/week 05/00-05/01

**Accomplishments:**

- Developed two LabView algorithms to correct for dual-lens and tri-lens laser systems

**Research Awards, Honors, & Recognitions:**

- Rita Schaffer BMES undergraduate award
- Best biomedical engineering senior design

**Supervisor(s):** Duco Jansen, PhD

**Research Advisor(s):** Duco Jansen, PhD

*Department of Biomedical Engineering  
Vanderbilt University  
Nashville, TN 37235*

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**Additional Experiences**

**Project:** Develop a computer network and data repository for Dr. Dustin Tyler's lab.

**Network Administrator** 5 hours/week 12/03-05/09

**Accomplishments:**

- Established a secure lab WIKI for internal collaboration and file sharing
- Established a secure network accessible storage (NAS) file repository with user-specific permissions
- Set up all computers on the lab network for remote computing
- Used Windows Network Monitor to populate data on a real-time web page to recommend computers on the network that had a low load and were open for remote computing

**Supervisor(s):** Dustin Tyler, PhD

*Department of Biomedical Engineering  
Case Western Reserve University  
Cleveland, OH, 44106*

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**Ongoing Teaching Experience**

**Class 1:** EBME 358: Biomedical Signal Processing Lab (Upperclass Undergraduate)

**Class 2:** EBME 359: Modeling Biomedical Systems Lab (Upperclass Undergraduate)

**Adjunct Instructor** 15-20 hours/week 08/12-Present

**Guest Lecturer** 5 hours/week 01/10-02/10



**Accomplishments:**

- Planned, lectured, and provided hand-on instruction for signal processing labs using MATLAB and Simulink focusing on sampling principles, step and impulse system responses, Laplace and Fourier analysis of circuits, filtering
- Planned, lectured, and provided hands-on instruction for biomedical system modeling labs using MATLAB and Simulink focusing on numerical methods, modeling systems governed by ordinary and partial differential equations, modeling musculoskeletal dynamics, modeling neural responses to electrical stimulation, and edge detection.
- Provided instruction on parallel computing and use of high performance cluster computing
- Established new lab assignments based on student feedback
- Incorporated Adobe Connect into lectures for real-time feedback/polling
- Supplied pre-recorded video lectures, enabling students to watch and review lectures prior to labs, which increased student productivity during labs
- Developed self-checking programs for labs to reduce TA dependence
- Established parallel, laptop-only lab sections to minimize usage of limited University resources (desktop computers), resulting in a 60% reduction in resource usage and a 20% reduction in classroom hours
- Incorporated plagiarism detecting software for lab reports and MATLAB code, resulting in a 90% reduction in cheating

**Supervisory Roles:**

- Managed a team of graduate and undergraduate TAs to ensure they were prepared to answer questions during labs as well as set deadlines for grading responsibilities

**Research Awards, Honors, & Recognitions:**

- Received 2 awards for excellence in teaching over 3 years (details in Awards & Recognition section)
- Received 3 unsolicited salary promotions over 3 years

**Supervisor(s):** Robert Kirsch, PhD

*Department of Biomedical Engineering  
Case Western Reserve University  
Cleveland, OH, 44106*

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**Mentorship & Supervisory Experience**

<b>Student:</b>	Josh Rosenberg	05/16-08/16
<b>Project:</b>	Development of a customizable double-layer axon model in Matlab	
<b>Role:</b>	Supervise translation of a NEURON model into Matlab, deployment and testing on a GPU	
<b>Student:</b>	Christian Stano	05/16-08/16
<b>Project:</b>	Developing an imaging-based method to rapidly assess hand joint angles	
<b>Role:</b>	Supervise development of a data acquisition suite, collection of data, algorithm development, and analysis of data	
<b>Student:</b>	Emma Headly	05/16-Present
<b>Project:</b>	Developing customizable, deformable, weighted test articles for use in assays that assess the effect of sensory restoration on function	

**Role:** Supervise development, verification and validation of a test articles  
**Student:** Shaunak Roy 08/15-Present  
**Project:** Digitization of sensory location data and data analysis to assess the effect of field shaping on sensory location  
**Role:** Supervise data entry and data analysis

**Student:** Cindy Martinez Rodas 06/15-12/15  
**Project:** Decoding abdominal surface potentials as command sources to optimize feeding schedule in very low birth weight infants  
**Role:** Supervise development of a data acquisition suite, collection of data, and analysis of data

**Student:** Jeffrey Shen 09/14-12/15  
**Project:** Quantifying applied pressures to objects during sensory restoration  
**Role:** Supervise collection of data from videos

**Student:** Ivana Cuberovic 08/14-Present  
**Project:** Developing advanced stimulus paradigms for restoring textured tactile sensations in amputees through electrical nerve stimulation  
**Role:** Supervise development and testing of a stimulator controller

**Student:** Remy Niman (*Graduated with BS*) 06/14-08/15  
**Project:** Intraoperative, sterile-field joint moment acquisition during electrical nerve stimulation  
**Role:** Supervise development and testing of an intraoperative joint moment/torque data acquisition device

**Student:** Josh Rosenberg (*Graduated with High School Diploma*) 06/14-08/15  
**Project:** Image detection algorithm development in MATLAB  
**Role:** Supervise data entry into a MATLAB database; supervise feature addition to database GUI

**Student:** Adam Boe (*Graduated with BS*) 01/14-06/14  
**Project:** Quantifying sensory locations and database development in MATLAB  
**Role:** Supervise data entry into a database

**Student:** Emily Graczyk 08/13-Present  
**Project:** Developing advanced stimulus paradigms for restoring tactile and proprioceptive sensations in amputees through electrical nerve stimulation  
**Role:** Supervise development, execution, and analysis of psychometric experiments

**Student:** Daniel Tan (*Graduated with PhD*) 07/12-06/14  
**Project:** Restoring tactile sensation in amputees through electrical nerve stimulation  
**Role:** Supervise development, execution, and analysis of sensory restoration experiments

**Student:** Max Freeberg 07/09-07/12  
**Project:** Developing efficient intraoperative data collection systems  
**Role:** Supervise development and testing of an intraoperative joint moment/torque data acquisition device; Supervise development and deployment of a gradient-search algorithm for use in intraoperative experiments

**Student:** Sheeba Joseph (*Graduated with MD/MS*) 01/10-09/10  
**Project:** Fascicular mapping of the human sciatic nerve

**Role:** Supervise anatomical data analysis for descriptive statistics of the human sciatic, tibial, and peroneal nerves

**Student:** Natalie Brill (*Graduated with PhD*) 01/08-05/09  
**Project:** 3D FEM neural modeling of the human median, ulnar, and radial nerves  
**Role:** Supervise the development of 3D FEM models and data analysis

**Student:** Yanna Grinberg (*Graduated with BS/MS*) 01/07-05/08  
**Project:** Computer modeling of fascicular effects on 3D electrical potential  
**Role:** Supervise computer model development and analysis

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## Grants & Fellowships

1. Case Western Reserve University School of Medicine, Clinical & Translational Science Collaborative (CTSC) Pilot Grant, "Stimulus Waveforms for the Splanchnic Nerves to Mimic Eating in Obese Subjects," 2015-2016
2. Department of Veterans Affairs Small Grants Program Pilot Grant, "Stimulus Waveforms for the Gastric Nerves to Mimic Eating in Obese Subjects," 2015-2016
3. Department of Veterans Affairs Career Development Award Level 1 (CDA-1), "Neural Interface and Control Design to Restore Sensation in Amputees," 2012-2014
4. Department of Veterans Affairs equipment grant to procure and develop a multi-investigator, mobile neurophysiology suite, 2011
5. NIH-Funded Training Grant in Musculoskeletal Research, Department of Orthopaedics, University Hospitals Medical Center, 2010-2012.
6. Ohio 3rd Frontier Innovation Incentives in Technology (IIT) Graduate Student Fellowship 2006-2008
7. The Department of Education Graduate Assistance in Areas of National Need (GAANN) Fellowship, 2001-2005

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## Patents & Patent Applications

1. D. Tyler, D. Tan, M. A. Schiefer, "Methods of treating medical conditions by population based encoding of neural information," WO2014093964 A1, 2014.
2. L. Fisher, M. Stone, D. J. Tyler, D. Tan, M. A. Schiefer, N. Brill, M. Miller, R. Triolo, "Implantable Cuff and Method for Functional Electrical Stimulation and Monitoring," WO2013188871 A1, 2013.
3. W. M. Grill and M. A. Schiefer, "System and Method for Selective Retinal Stimulation," US 8892211 B2, 2014.

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## Publications

### Peer-Reviewed Publications (h-index: 9; Total Citations: 387)

1. M. A. Schiefer, D. Tan, E. Graczyk, S. M. Sidik, D. J. Tyler, "Proportional sensory feedback improves object identification in individuals with upper limb loss using a myoelectric prosthesis," *Expected Submission: Oct 2016.*

2. E. Graczyk, M. A. Schiefer, H. P. Saal, B. P. Delhay, E. W. Schluter, S. J. Bensmaia, D. J. Tyler, "The Neural Basis of Perceived Intensity in Natural and Artificial Touch," *Science Trans Med*, 2016 *To Be Published Oct 2016*; Impact Factor: 15.8.
  3. M. A. Schiefer & D. Tan, S. M. Sidik, D. J. Tyler, "Sensory feedback by peripheral nerve stimulation improves task performance in individuals with upper limb loss using a myoelectric prosthesis," *J Neur Eng*, 13(1):016001, 2016; Impact Factor: 3.3.
  4. D. Tan & M. Schiefer, M. W. Keith, J. R. Anderson, D. J. Tyler, "Stability and selectivity of a chronic, multi-contact cuff electrode for sensory stimulation in a human amputee," *J Neur Eng*, 12(2):026002, 1-10, 2015; Impact Factor: 3.4.
  5. D. Tan & M. A. Schiefer, M. Keith, J. R. Anderson, J. Tyler, D. J. Tyler, "A neural interface provides long-term stable natural touch perception" *Science Trans Med*, 6(257) 257ra138, 2014; Impact Factor: 15.8.
  6. M. A. Schiefer, M. Freeberg, G. J. C. Pinault, J. Anderson, H. Hoyen, D. J. Tyler, R. J. Triolo, "Selective Activation of the Human Tibial and Common Peroneal Nerves with a Flat Interface Nerve Electrode," *J Neur Eng*, 10(5):056006, 1-13, 2013; Impact Factor: 3.3.
  7. M. A. Schiefer, D. J. Tyler, R. J. Triolo, "Probabilistic Modeling of Selective Stimulation of the Human Sciatic Nerve with a Flat Interface Nerve Electrode," *J Comp Neurosci*, 31(3):179-190, 2012; Impact Factor: 2.3
  8. M. A. Schiefer, K. H. Polasek, G. C. J. Pinault, R. J. Triolo, D. J. Tyler, "Selective stimulation of the common human femoral nerve with a Flat Interface Nerve Electrode," *J Neur Eng*, 7(2): 26006, 1-9, 2010; Impact Factor: 3.7
  9. K. H. Polasek, M. A. Schiefer, G. C. J. Pinault, R. J. Triolo, D. J. Tyler, "Intraoperative evaluation of the spiral nerve cuff electrode on the femoral nerve trunk," *J Neur Eng*, 6(6): 66005, 1-6, 2009; Impact Factor: 3.7
  10. Y. Grinberg, M. A. Schiefer, D. J. Tyler, K. J. Gustafson, "Fascicular perineurium thickness, size, and position affect model predictions of neural excitation," *IEEE Trans Neur Sys Rehab Eng*, 16: 572-581, 2008; Impact Factor: 2.4
  11. M. A. Schiefer, R. J. Triolo, D. J. Tyler, "A model of selective activation of the femoral nerve with a flat interface nerve electrode for a lower extremity neuroprosthesis," *IEEE Trans Neur Sys Rehab Eng*, 16: 195-204, 2008; Impact Factor: 2.4
  12. M. A. Schiefer, W. M. Grill, "Sites of neuronal excitation by epiretinal electrical stimulation," *IEEE Trans Neur Sys Rehab Eng*, 14: 5-13, 2006; Impact Factor: 2.4
  13. D. C. Lee, A. L. Jensen, M. A. Schiefer, C. W. Morgan, W. M. Grill, "Structural mechanisms to produce differential dendritic gains," *Brain Research*, 1033: 117-127, 2005; Impact Factor: 2.5
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#### **Peer-Reviewed Book Chapters & Encyclopedia Entries**

1. E. G. Damato, M. J. Decker, M. A. Schiefer, J. Z. Baskin, G. F. Benderro, K. P. Strohl, "Upper Airway Neurostimulation to Treat Obstructive Sleep Apnea" in *Neuromodulation*, 2<sup>nd</sup> Ed., ed. E. S. Krames, P. H. Peckham, A. R. Rezai, Elsevier, 2017.
  2. M. A. Schiefer, D. J. Tyler, "Modeling Peripheral Nerves" in *Sunderland's Nerves and Nerve Injuries*, 3rd Ed., ed. S. Tubbs, Elsevier, 2015.
  3. D. J. Tyler, K. H. Polasek, M. A. Schiefer, "Peripheral Nerve Interfaces" in *Sunderland's Nerves and Nerve Injuries*, 3rd Ed., ed. S. Tubbs, Elsevier, 2015.
  4. M. A. Schiefer, "Peripheral Nerve Models" in *Encyclopedia of Computational Neuroscience*, eds. D. Jaeger and R. Jung, Springer Reference, 2013.
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#### **National & International Peer-Reviewed Abstracts & Proceedings**

1. M. A. Schiefer, I. Cuberovic, E. L. Graczyk, D. J. Tyler (2016) "Muscle contraction is significantly associated with proprioception restored with electrical nerve stimulation with a Flat Interface Nerve Electrode (FINE)," *Soc Neurosci Annual Conference (Poster)*

2. E. L. Graczyk, M. A. Schiefer, H. P. Saal, B. P. Delhay, S. J. Bensaïma, D. J. Tyler (2016) "Fascicular organization affects tactile sensation evoked from peripheral nerve cuff stimulation," Soc Neurosci Annual Conference (Poster)
3. I. Cuberovic, M. A. Schiefer, J. Anderson, D. J. Tyler (2016) "Developing patient-specific, in-situ computational models using intraoperative ultrasound," Soc Neurosci Annual Conference (Poster)
4. D. J. Tyler, E. Graczyk, M. Schiefer, I. Cuberovic, K. Malone, M. Keith, J. Anderson (2016) "Evolution of human-in-the-loop neuroprosthesis – toward an artificial hand," Soc Neurosci Annual Conference (**Platform**)
5. M. A. Schiefer, D. Tan, E. Graczyk, M. Keith, J. R. Anderson, J. Tyler, D. J. Tyler (2014) "Restoring Sensation in Amputees: Functional Assessments," Myoelectric Control Symposium (**Platform**)
6. D. Tan, M. A. Schiefer, E. Graczyk, M. Keith, J. R. Anderson, D. J. Tyler (2014) "Restoring Sensation in Amputees: Chronic Stability of Implanted Cuff Electrodes," Myoelectric Control Symposium (**Platform**)
7. E. Graczyk, M. A. Schiefer, D. Tan, M. Keith, J. R. Anderson, J. Tyler, D. J. Tyler (2014) "Restoring Sensation in Amputees: Clinical Considerations," Myoelectric Control Symposium (**Platform**)
8. M. A. Schiefer, D. W. Tan, E. Graczyk, M. Keith, J. R. Anderson, D. J. Tyler (2014) "Assessing Functional Improvements with Varied Sensory Restoration in Upper Extremity Amputees," Neural Interfaces Conference (Poster)
9. D. W. Tan, M. A. Schiefer, M. Keith, R. Anderson, D. J. Tyler (2013) "Restoring sensation in amputees with nerve cuff electrodes," Soc Neurosci Annual Conference (Poster)
10. D. W. Tan, M. A. Schiefer, M Keith, R. Anderson, D. J. Tyler (2013) "Stability and selectivity of a chronic, multi-contact cuff electrode for sensory stimulation in a human amputee," 6th Int IEEE/EMBS Neural Eng Conf (Poster)
11. M. A. Schiefer, D. W. Tan, R. Anderson, M. Keith, M. Schmitt, J. Tyler, D. J. Tyler (2013) "Restoring sensation in amputees with nerve cuff electrodes," BMES Annual Conference (**Platform**)
12. D. W. Tan, M. A. Schiefer, M. Keith, R. Anderson, D. J. Tyler (2013) "Chronic stability of implanted cuff electrodes in amputees" BMES Annual Conference (Poster)
13. M. A. Schiefer, D. J. Tyler, R. J. Triolo (2012) "Design of Nerve Cuff Electrodes for the Sciatic, Tibial, and Common Peroneal Nerves Using Probabilistic Models," Neural Interfaces Conference 2012 (Poster)
14. M. A. Schiefer, D. J. Tyler, R. J. Triolo (2011) "Probabilistic Modeling of Selective Stimulation of the Human Sciatic Nerve with a Flat Interface Nerve Electrode," 33rd Annual International IEEE EMBS Conference (Poster)
15. M. Freeberg, M. A. Schiefer, R. J. Triolo (2011) "Efficient Search and Fit Methods to Find Nerve Stimulation Parameters for Multi-Contact Electrodes," 33rd Annual International IEEE EMBS Conference (Poster)
16. M. A. Schiefer, K. H. Polasek, R. J. Triolo, G. C. Pinault, D. J. Tyler (2009) "Optimized Design of Neural Interfaces for Femoral Nerve Clinical Neuroprostheses: Anatomically-Based Modeling and Intraoperative Evaluation," 31st Annual International IEEE EMBS Conference (Poster)
17. M. A. Schiefer, K. H. Polasek, G. C. Pinault, R. J. Triolo, D. J. Tyler (2008) "Intraoperative Evaluation of the Flat Interface Nerve Electrode for Selective Recruitment of Anterior Thigh Muscles in Humans," 38th Annual NIH Neural Interfaces Conference (Poster)
18. Y. Grinberg, M. A. Schiefer, D. J. Tyler, K. J. Gustafson (2008) "Physiologic Fascicle Size and Perineurial Thickness Affect Predictions of Stimulation Selectivity," 38th Annual NIH Neural Prosthesis Workshop (Poster)
19. Y. Grinberg, M. A. Schiefer, D. J. Tyler, K. J. Gustafson (2007) "Physiologic Fascicle Size and Perineurial Thickness Affect Stimulation Selectivity," BMES Annual Conference (Poster)

20. M. A. Schiefer, K. H. Polasek, G. C. Pinault, R. J. Triolo, D. J. Tyler (2007) "Intraoperative Evaluation of the First Flat Interface Nerve Electrode for a Standing Neuroprosthesis: A Case Report," 3rd International IEEE/EMBS Conference on Neural Engineering (**Platform**)
  21. K. H. Polasek, M. A. Schiefer, G. C. Pinault, R. J. Triolo, D. J. Tyler (2007) "Intraoperative Evaluation of the Spiral Nerve Cuff Electrode for a Standing Neuroprosthesis," 3rd International IEEE/EMBS Conference on Neural Engineering (Poster)
  22. M. A. Schiefer, R. J. Triolo, D. J. Tyler (2006) "Models of Selective Stimulation with a Flat Interface Nerve Electrode for Standing Neuroprosthetic Systems," 28th International IEEE/EMBS Conference (**Platform**)
  23. M. A. Schiefer, R. J. Triolo, D. J. Tyler (2006) "Selectively Stimulating the Human Femoral Nerve with a Flat Interface Nerve Electrode," 37th Annual NIH Neural Prosthesis Workshop (Poster)
  24. M. A. Schiefer, R. J. Triolo, D.M. Durand, D. J. Tyler (2005) "Modeling Selective Stimulation with a FINE for Standing Neuroprosthetics," BMES Annual Conference (Poster)
  25. M. A. Schiefer, R. J. Triolo, D.M. Durand, D. J. Tyler (2005) "Modeling Selective Stimulation with a FINE for Standing Neuroprosthetics," 10th Annual Conference of the International Functional Electrical Stimulation Society (Poster)
  26. M. A. Schiefer, R. J. Triolo, D.M. Durand, D. J. Tyler (2005) "Modeling Selective Stimulation with a Flat Interface Nerve Electrode for Standing Neuroprosthetic Systems," 2nd International IEEE/EMBS Conference on Neural Engineering (**Platform**)
  27. M. A. Schiefer, R. J. Triolo, D.M. Durand, D. J. Tyler (2004) "Optimized Contact Location on a Flat Interface Nerve-Cuff Electrode for Use in Standing Neuroprosthetic Systems," 35th Annual NIH Neural Prosthesis Workshop (Poster)
  28. M. A. Schiefer, W.M. Grill (2003) "A model of Excitation Sites During Epiretinal Electrical Stimulation," 34th Annual NIH Neural Prosthesis Workshop (Poster)
  29. M. A. Schiefer, W.M. Grill (2003) "Modeling Excitation Sites of Retinal Ganglion Cells During Epiretinal Electrical Stimulation," BMES Annual Conference. (**Platform**)
  30. M. A. Schiefer, W.M. Grill (2002) "Modeling Excitation Sites During Epiretinal Electrical Stimulation," 33rd Annual NIH Neural Prosthesis Workshop (Poster)
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### **Regional Abstracts & Public Presentations**

1. M. A. Schiefer, D. W. Tan, R. Anderson, M. Keith, M. Schmitt, J. Tyler, D. J. Tyler (2013) "Sensory Restoration Through Electrical Nerve Stimulation Improves Prosthetic Hand Function," Research ShowCASE (Poster)
2. M. A. Schiefer, D. J. Tyler, R. J. Triolo (2012) "Comparing Probabilistic Models of Electrical Stimulation of the Sciatic, Tibial, and Common Peroneal Nerves," Musculoskeletal Research Day (Poster)
3. M. A. Schiefer, D. J. Tyler, R. J. Triolo (2012) "Comparing Probabilistic Models of Electrical Stimulation of the Sciatic, Tibial, and Common Peroneal Nerves," Musculoskeletal Research Day (**Platform**)
4. E. Peterson, N. Brill, M. A. Schiefer, D. J. Tyler (2009) "Advancement of a Computationally Efficient Method to Predict Neural Activation with Nerve Cuff Stimulation," Department of Biomedical Engineering 40th Anniversary (Poster)
5. M. A. Schiefer, K. H. Polasek, R. J. Triolo, G. C. Pinault, D. J. Tyler (2009) "Optimized Design of Neural Interfaces for Femoral Nerve Clinical Neuroprostheses: Anatomically-Based Modeling and Intraoperative Evaluation," Research ShowCASE (Poster)
6. M. A. Schiefer (2009) "Optimized Design of neural Interfaces for Femoral Nerve Clinical Neuroprostheses: Anatomically-Based Modeling and Intraoperative Evaluation," Dissertation Defense, March 16, 2009.

7. M. A. Schiefer, K. H. Polasek, G. C. Pinault, R. J. Triolo, D. J. Tyler (2008) "Intraoperative Evaluation of the Flat Interface Nerve Electrode for Selective Recruitment of Anterior Thigh Muscles in Humans," 31st Annual Biomedical Graduate Student Symposium (**Platform**)
8. M. A. Schiefer, K. H. Polasek, G. C. Pinault, R. J. Triolo, D. J. Tyler (2008) "Intraoperative Evaluation of the Flat Interface Nerve Electrode for Selective Recruitment of Anterior Thigh Muscles in Humans," Ohio State University Workshop on Restoration of Movement Via Peripheral Nerve Stimulation (Poster)
9. Y. Grinberg, M. A. Schiefer, D. J. Tyler, K. J. Gustafson (2008) "Physiologic Fascicle Size and Perineurial Thickness Affect Predictions of Stimulation Selectivity," Ohio State University Workshop on Restoration of Movement Via Peripheral Nerve Stimulation (Poster)
10. M. A. Schiefer, K. H. Polasek, G. C. Pinault, R. J. Triolo, D. J. Tyler (2008) "Intraoperative Evaluation of the Flat Interface Nerve Electrode for Selective Recruitment of Anterior Thigh Muscles in Humans," Research ShowCASE (Poster)
11. Y. Grinberg, M. A. Schiefer, D. J. Tyler, K. J. Gustafson (2008) "Physiologic Fascicle Size and Perineurial Thickness Affect Predictions of Stimulation Selectivity," Research ShowCASE (Poster)
12. M. A. Schiefer, K. H. Polasek, G. C. Pinault, R. J. Triolo, D. J. Tyler (2007) "Models of Selective Stimulation with and Intraoperative Testing of a Flat Interface Nerve Electrode," Neural Engineering and Rehabilitation Lectures (Poster)
13. Y. Grinberg, M. A. Schiefer, D. J. Tyler, K. J. Gustafson (2007) "Effects of Fascicle Size and Perineurial Thickness on Stimulation Selectivity," Neural Engineering and Rehabilitation Lectures (Poster)
14. K. H. Polasek, M. A. Schiefer, G. C. Pinault, R. J. Triolo, D. J. Tyler (2007) "Intraoperative Evaluation of the Spiral Nerve Cuff Electrode for a Standing Neuroprosthesis," Neural Engineering and Rehabilitation Lectures (Poster)
15. M. A. Schiefer, R. J. Triolo, G. C. Pinault, D. J. Tyler (2007) "Models of Selective Stimulation with and Intraoperative Testing of a Flat Interface Nerve Electrode," Research ShowCASE (Poster)
16. K. H. Polasek, M. A. Schiefer, G. C. Pinault, R. J. Triolo, D. J. Tyler (2007) "Intraoperative Evaluation of the Spiral Nerve Cuff Electrode for a Standing Neuroprosthesis," Research ShowCASE (Poster)
17. M. A. Schiefer, R. J. Triolo, D. J. Tyler (2006) "Models of Selective Stimulation with a Flat Interface Nerve Electrode for Standing Neuroprosthetic Systems," Neural Engineering and Rehabilitation Lectures (Poster)
18. M. A. Schiefer, R. J. Triolo, D. J. Tyler (2006) "Models of Selective Stimulation with a Flat Interface Nerve Electrode for Standing Neuroprosthetic Systems," 29th Annual Biomedical Graduate Student Symposium (Poster)
19. M. A. Schiefer, R. J. Triolo, D. J. Tyler (2006) "Models of Selective Stimulation with a Flat Interface Nerve Electrode for Standing Neuroprosthetic Systems," Research ShowCASE (Poster)
20. M. A. Schiefer, K. J. Gustafson, R. J. Triolo, D.M. Durand, D. J. Tyler (2005) "Modeling Selective Stimulation with a FINE for Standing Neuroprosthetics," BME Research ShowCASE (Poster)
21. M. A. Schiefer, R. J. Triolo, D.M. Durand, D. J. Tyler (2005) "Modeling Selective Stimulation with a FINE for Standing Neuroprosthetics," Neural Engineering and Rehabilitation Day (Poster)
22. M. A. Schiefer, K. J. Gustafson, R. J. Triolo, D.M. Durand, D. J. Tyler (2005) "Models of Selective Stimulation with a Flat Interface Nerve Electrode for Standing Neuroprosthetic Systems," 28th Annual Biomedical Graduate Student Symposium (Poster)
23. M. A. Schiefer, R. J. Triolo, D.M. Durand, D. J. Tyler (2005) "Models of Selective Stimulation with a Flat Interface Nerve Electrode for Standing Neuroprosthetic Systems," ShowCASE (Poster)

24. M. A. Schiefer, R. J. Triolo, K. J. Gustafson, D. J. Tyler (2004) "Optimized Contact Location on a Flat Interface Nerve-Cuff Electrode for Use in Standing Neuroprosthetic Systems," Neural Engineering and Rehabilitation Day (Poster)
25. M. A. Schiefer, W.M. Grill (2003) "A model of Excitation Sites During Epiretinal Electrical Stimulation," Neural Engineering and Rehabilitation Day (Poster)
26. M. A. Schiefer, W.M. Grill (2002) "Modeling Excitation Sites During Epiretinal Electrical Stimulation," Applied Neural Control Research Day (Poster)

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## Other Presentations

### Invited Platform Presentations

1. M. A. Schiefer, "Lessons Learned From A Multi-Year Study in Sensory Restoration Through Peripheral Nerve Stimulation" (2016) Neuromorphic Tactile Sensing at the Telluride Workshop.
2. M. A. Schiefer, "Sensory Restoration Using Electrical Nerve Stimulation" (2015), VA Research Week.
3. M. A. Schiefer, "My Path to Biomedical Engineering" (2015) Antonian College Preparatory High School. Conducted remotely through videoconferencing.
4. "Restoration of Tactile Sensation in Upper Extremity Amputees Through Electrical Nerve Stimulation" (2014) 6th Annual Regional Amputee Rehabilitation Course on Upper Limb Prosthetic and Orthotic Rehabilitation
5. "Restoring Natural Sensation to Amputees" (2013) APT Center Investigator Meeting.
6. "An Overview of Biomedical Engineering" (2013) Hiram College.
7. "An Overview of Neural Engineering" (2013) Hiram College.
8. "Design of Lower Extremity Neural Interfaces: Anatomically-Based, Model-Driven Design and Intraoperative Evaluation," (2010) OCNS 19th Annual International Conference.

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### Presentations to VIPs

1. Update on the Sensory Restoration in Amputees Project presented to
  - a. LSCDVAMC Director Mrs. Susan Fuehrer and VISN representatives, April 2015
  - b. Mr. Scott Blackburn and the myVA Task Force, Nov 2014.
  - c. Congresswoman Mary Rose Oakar, Oct 2014.
  - d. A group from the American Legion, Mar 2014.
  - e. A group from Bridge Builders, Feb 2014.
  - f. Congresswoman Marcy Kaptur, Aug 2013.
  - g. Congressman Jim Renacci, Apr 2013.

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### Internal Presentations

1. "Comparison of Sciatic, Tibial, and Common Peroneal Probabilistic Models of Electrical Nerve Stimulation," VA Motion Studies Laboratory Weekly Meeting, Jan 2012.
2. "Comparison of Sciatic, Tibial, and Common Peroneal Probabilistic Models of Electrical Nerve Stimulation," Department of Orthopaedics Musculoskeletal Training Grant Project Report, Dec 2011.
3. "Modeling and Evaluation of Lower Extremity Nerve Stimulation," Department of Orthopaedics Musculoskeletal Training Grant Project Report, May 2011.
4. "Modeling and Evaluation of Lower Extremity Nerve Stimulation," Department of Orthopaedics Musculoskeletal Training Grant Project Report, Feb 2011.
5. "Modeling and Evaluation of Lower Extremity Nerve Stimulation," VA Motion Studies Laboratory Weekly Meeting, Feb 2011.



6. "Update on Sciatic Nerve Modeling & Intraoperative Results from the August 2010 Bilateral Spiral Nerve Cuff Electrode Implants," VA Motion Studies Laboratory Weekly meeting, Nov. 2010.
7. "Reviewing Kesar's 2009 Paper on a Dual Dorsiflexion/Plantarflexion FES System," Department of Orthopaedics Musculoskeletal Training Grant Journal Club, Oct. 2010.
8. "Design and Evaluation of a Sciatic Nerve Interface," VA Motion Studies Laboratory Weekly Meeting, July 2010.
9. "Design of Lower Extremity Neural Interfaces: Anatomically-Based, Model-Driven Design and Intraoperative Evaluation," Department of Orthopaedics Musculoskeletal Training Grant Project Report, June 2010.
10. "Developing an Optimized Lower Extremity Interface for a Neural Prosthesis," VA Motion Studies Laboratory Weekly Meeting, Dec. 2009.
11. "Optimized Design of Neural Interfaces for Femoral Nerve Clinical Neuroprostheses: Intraoperative Evaluation of an Anatomically-Based Model-Driven Design," MetroHealth Functional Electrical Stimulation Weekly Meeting, Apr. 2009.
12. "Modeling and Intraoperative Evaluation of the Flat Interface Nerve Electrode (FINE) for Selective Recruitment of Anterior Thigh Muscles in Humans," Neural Engineering Center Weekly Meeting, Aug. 2008.
13. "Selectively Stimulating the Femoral Nerve with a Flat Interface Nerve Electrode: Modeling & Intraoperative Evaluation," VA Motion Studies Laboratory Weekly Meeting, Feb. 2008.
14. "Models of Selective Stimulation with and Intraoperative Testing of a Flat Interface Nerve Electrode," Neural Engineering Center Weekly Meeting, June 2007.
15. "Models of Selective Stimulation with a Flat Interface Nerve Electrode (FINE) for Standing Neuroprosthetic Systems," Department of Biomedical Engineering Weekly Meeting, Sept. 2006.
16. "Models of Selective Stimulation with a Flat Interface Nerve Electrode (FINE) for Standing Neuroprosthetic Systems," VA Motion Studies Laboratory Weekly Meeting, Sept. 2006.
17. "Models of Selective Stimulation with a Flat Interface Nerve Electrode for Standing Neuroprosthetic Systems," Laboratory for Neuromimetic and Neural Integrated Systems Meeting, Mar. 2006.
18. "Development of an Optimized Nerve Cuff Electrode for Selective Activation of Fascicles of the Human Femoral Nerve," MetroHealth Functional Electrical Stimulation Weekly Meeting, Mar. 2006.
19. "Development of an Optimized Nerve Cuff Electrode for Selective Activation of Fascicles of the Human Femoral Nerve," Neural Engineering Center Weekly Meeting, Feb. 2006.
20. "Models of Selective Stimulation with a Flat Interface Nerve Electrode for Standing Neuroprosthetic Systems," VA Motion Studies Laboratory Weekly Meeting, Oct. 2005.
21. "Modeling Selective Stimulation with a FINE for Standing Neuroprosthetics," Neural Engineering Center Weekly Meeting, Apr. 2005.
22. "Modeling Selective Stimulation with a FINE for Standing Neuroprosthetics," MetroHealth Functional Electrical Stimulation Weekly Meeting, Jan. 2005.

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## Service

- Cleveland NEW: steering the future of the neural engineering field: 2011, 2013, 2015
- Invited Manuscript/Abstract Reviewer (Alphabetically)
  - o Annals of Biomedical Engineering: 2012
  - o Back and Musculoskeletal Rehabilitation: 2015
  - o Biomedical Engineering Society Annual Conference: 2014 (x7), 2015 (x7)
  - o Clinical Neurophysiology: 2012, 2013, 2014
  - o Disability and Rehabilitation: Assistive Technology: 2011, 2012

- European Medical Journal Neurology: 2016 (x3)
- IEEE Transactions on Neural Systems and Rehabilitation Engineering: 2011 (x2), 2012 (x2), 2013, 2015
- Journal of Neural Engineering: 2009, 2013, 2016
- Journal of Neurophysiology: 2015, 2016
- Local and Regional Anesthesia: 2010, 2013
- Myoelectric Control Conference: 2014
- Nature – Scientific Reports: 2016
- PLOS ONE: 2016
- Transactions on Biomedical Engineering: 2008
- Representative at APT Center Booth at multiple conferences
- Alumnus Interviewer for potential Vanderbilt University students: 2014 (x2), 2015 (x3)
- Engineering Alumni Mentor for Vanderbilt University students: 2013, 2014
- Organizing committee member for the Musculoskeletal Research Day Conference: 2012
- Judge, Solon Middle School Science Fair: 2011, 2015
- Juror, Case Western Reserve University’s Graduate and Professional Student Academic Integrity Board: 2005-2007

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## Past Leadership Positions

### Organization 1: Graduate Student Senate

<b>At-Large Executive Officer</b>	5 hours/week	05/07-05/08
<b>President</b>	10 hours/week	05/06-05/07
<b>Faculty Senate Representative</b>	1 hour/week	05/06-05/07
<b>Member, Diekhoff Award</b>	1 hour/week	05/07-05/08
<b>Chair, Diekhoff Award</b>	1.5 hours/week	05/06-05/07
<b>Chair, V-Fund</b>	0.5 hour/week	05/06-05/07
<b>Chair, Preparing Future Faculty</b>	3 hours/week	05/04-04/07
<b>Chair, Organizations/Allocations</b>	1 hour/week	05/05-05/06
<b>Corresponding Secretary</b>	1 hour/week	05/05-05/06
<b>School of Engineering Representative</b>	0.5 hour/week	05/04-05/05
<b>Senator</b>	0.5 hour/week	05/04-05/05

### Accomplishments:

- Represented the graduate student body to the Faculty Senate as a voting member
- Established an environment of data-driven executive decisions
- Altered graduate student fee from a fixed cost to an inflation-adjusted cost
- Conceived, organized, and executed a financial planning series of lectures
- Documented all executive committee and full assembly session discussions
- Established a senate website and provided data and senate documents to maintain transparency
- Worked with a team of graduate students to create a mentoring handbook for graduate students and faculty members that was later adopted by the Faculty Senate
- Represented interests of the Biomedical Engineering graduate students at full assembly sessions
- Managed fund collection and distribution for the V-Fund to facilitate conference attendance by graduate students
- Managed senate budget

- Solicited nominations for and interviewed nominees for the Diekhoff Award for Outstanding Mentorship
- Responsible for bringing Richard Lederer for the Keynote Address at Commencement 2007

**Supervisory Roles:**

- Managed the executive committee of the Graduate Student Senate
- Managed senators representing each graduate department
- Presided over the Graduate Student Senate

**Awards, Honors, & Recognitions:**

- Nominated for the Lenore Kola Award for Exemplary Service to the Graduate Student Community

**Supervisor(s):** Charles Rozek, PhD, Denise Douglas, PhD

*Case Western Reserve University  
Cleveland, OH, 44106*

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**Organization 2:** Faculty Senate

<b>Member, Committee on IT &amp; Communication</b>	0.5 hour/week	09/11-04/12
<b>Member, President’s Taskforce on Security &amp; Safety</b>	0.5 hour/week	04/07-05/07
<b>Member, Committee on Academic Affairs &amp; Student Life</b>	0.5 hour/week	08/06-05/07
<b>Member, Committee on Grad/Prof Student Experience</b>	0.5 hour/week	08/06-05/07
<b>Member, Committee on Information Resources</b>	0.5 hour/week	08/05-05/07
<b>Member, Committee on Graduate Studies</b>	0.5 hour/week	08/05-05/07

**Accomplishments:**

- Represented the post-doctoral body with regard to information technology on campus, particularly in regard to available software resources
- Represented the graduate student body across a range of Faculty Senate committees

*Case Western Reserve University  
Cleveland, OH, 44106*

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**Organization 3:** Biomedical Engineering Graduate Student Association

<b>Representative for the Graduate Student Senate</b>	1 hour/week	04/05-04/07
<b>President</b>	5 hours/week	04/04-04/05
<b>Chair, Holiday Committee</b>	0.5 hour/week	04/02-04/04
<b>Vice President</b>	1 hour/week	04/02-04/03

**Accomplishments:**

- Established an environment of data-driven executive decisions
- Oversaw the annual holiday party with a \$10,000 budget
- Increased philanthropic donations by 25%

*Case Western Reserve University*

**Organization 4: Vanderbilt Engineering Council**

<b>President, V<sup>2</sup></b>	5 hours/week	05/00-05/01
<b>Mentor, V<sup>2</sup></b>	1 hour/week	08/98-12/98

**Accomplishments:**

- Established an environment of data-driven executive decisions
- Conceived, organized, and executed a series of lectures in which guest speakers were brought to the University to discuss a broad range of engineering disciplines to help freshman engineering students choose a major of study
- Organized and managed a team of freshman engineers competing in the Rube Goldberg local competition (1<sup>st</sup> place) and national competition

**Awards, Honors, & Recognitions:**

- The Dean's Award for Outstanding Service
- The John T. and Lizzie Allen McGill Award, awarded to an upperclassman who is academically accomplished, has demonstrated qualities of leadership, and whose efforts have led to an increased understanding of other student's needs and a more civil campus atmosphere

*Vanderbilt University  
Nashville, TN 37235*

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**Awards, Honors, & Recognitions**

- **Publication Honors**
  1. Cover Article, Science Translational Medicine, 8 October 2014.
  2. Selected for the Journal of Neural Engineering's 2010 Highlights (Top 10 Articles of 2010, #4)
  3. Cover Article, IEEE Trans Neur Sys Rehab Eng, 16(2), April 2008.
- **Teaching**
  1. Tau Beta Pi Gutti Memorial Engineering Teaching Award (2015)
  2. Excellence in Teaching, presented by undergraduate engineering societies (2013)
- **Post-Doctoral**
  1. Nominated for Crain's Cleveland 40 Under 40 Award (2015)
  2. Musculoskeletal Research Day: Best Postdoctoral Presentation (2012)
  3. Art of Science winner – artistic representation of scientific experiments or data (2011)
  4. SciFoo Conference, by-invitation only by Google, Nature, and O'Reilly Media (2010, 2011)
  5. Organization for Computational Neurosciences (ONCS) Conference Travel Award (2010)
- **Graduate**
  1. Research ShowCase: 3rd Place (2009), Poster Award (2008), Honorable Mention (2007)
  2. American Association for the Advancement of Science – Program for Excellence in Science Award (2008)

3. Biomedical Graduate Student Symposium: Best Oral Presentation (2008), Best Poster Presentation (2005)
  4. Neural Engineering and Rehab Day Conference: 1st Place (2007), 2nd Place (2005, 2006), 3rd Place (2003)
  5. Nominated for the Lenore Kola Award for Exemplary Service to the Graduate Student Community (2007)
  6. Case Western Reserve Univ. Graduate Studies Endowment-Sponsored Mentorship Award (2003)
  7. Biomedical Engineering Society Student Travel Award (2003)
- **Undergraduate**
    1. The Rita Schaffer Biomedical Engineering Society Award (2001)
    2. The Engineering Dean's Award for Outstanding Service (2001)
    3. The Thomas G. Arnold Prize for Best Senior Biomedical Engineering Design (2001)
    4. The John T. and Lizzie Allen McGill Award, awarded to an upperclassman who is academically accomplished, has demonstrated qualities of leadership, and whose efforts have led to an increased understanding of other student's needs and a more civil campus atmosphere (2001)
    5. 1<sup>st</sup> place, regional Rube Goldberg design competition (2000, 2001)
    6. Dean's List (1996-2001)
  - **Other**
    1. Intramural Summer Racquetball Tournament: 1st Place (2007, 2010), 2nd Place (2006)

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### Research Featured in Popular Media

- J. Fischmann "Revolution in Artificial Limbs Brings Feeling Back to Amputees," National Geographic, Feb. 22, 2014.
- Discovery Channel Canada's "Dailey Planet," Air Date: Jan. 14, 2014.
- D. Talbot, "An Artificial Hand with Real Feeling," MIT Tech Review, Feb. 18, 2014.
- B. Zeltner, "Prosthetic Hand with Sense of Touch in Development at Case and Cleveland VA," The Cleveland Plain Dealer, Dec. 27, 2013.
- M. Campbell, "Paralysed limbs revived by hacking into nerves," New Scientist, 2754: 16-17, 2010.

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### Education

- Post-Doctoral Scholar & Fellowship – Department of Orthopaedics, Case Western Reserve University School of Medicine, Cleveland, OH, 2009-2012.
- PhD, Biomedical Engineering – Neural Engineering, Case Western Reserve University, Cleveland, OH, 2003-2009, GPA: 3.83/4.0
- MS, Biomedical Engineering – Neural Engineering, Case Western Reserve University, Cleveland, OH, 2001-2003
- BE, Biomedical Engineering, Vanderbilt University, Nashville, TN, May 2001, Magna Cum Laude, GPA: 3.65/4.0

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### Additional Certifications & Training

Engineer in Training/Fundamental of Engineering Certified (EIT/FE)  
 Lab Safety (OSHA)

Blood-Borne Pathogen (OSHA)  
Environment of Care (EOC) Safety (VAMC)  
Hazardous Material Shipping – Exempt Pt. Specimens, Category B, Preservatives (VAMC)  
Human Research (VAMC; Dept of Navy)  
Human Subjects Protection and Good Clinical Practices (VAMC)  
Information Security Awareness (VAMC)  
Microisolator Technique (VAMC)  
Occupational Health VA (VAMC)  
Post-Procedural Care of Rodents (VAMC)  
Privacy Awareness (VAMC)  
Research Safety (VAMC)  
Rodent Survival Surgery (VAMC)  
Waste Anesthetic Gas Safety (VAMC)  
Working with Rats (VAMC)  
VA Animal Research Facility (ARF) (VAMC)  
Biomedical Engineering Entrepreneurship Academy at the University of California – Davis

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## **Additional Skills**

### **Software**

- MATLAB
- Simulink
- xPC Target
- NEURON
- Ansys (Formerly Ansoft) Maxwell 3D
- MiniTab
- MS Office (Word, Publisher, Excel, PowerPoint)
- MS SharePoint
- MS Project
- Adobe Connect
- Adobe Creative Suite (Photoshop, Illustrator)
- VBScript
- JavaScript
- HTML
- CSS

### **Hardware**

- Function Generator
- Oscilloscope
- Data Acquisition (A/D)
- Stimulators
- Programmable Amplifiers
- Force and Bend Transducers
- EMG Needle and Surface Electrodes
- Flat Interface Nerve Cuff Electrode (FINE)
- Spiral Nerve Cuff Electrode
- Basic Electronic Hardware