

## JAMES J. ABBAS, PhD

### CONTACT INFORMATION

Address: Center for Adaptive Neural Systems  
School of Biological and Health Systems Engineering  
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Citizenship: USA

### EDUCATION

#### **Post-doctoral Fellowship, 1992-1993.**

Shriners Hospital, Philadelphia, PA  
Advisor: Ronald J. Triolo, PhD

#### **PhD, Biomedical Engineering, 1992.**

Case Western Reserve University, Cleveland, OH  
Thesis title: *Neural Network Control of Functional Neuromuscular Stimulation Systems.*  
Advisor: Howard J. Chizeck, ScD

#### **MS, Biomedical Engineering, 1989.**

Case Western Reserve University, Cleveland, OH  
Thesis title: *Feedback Control of Coronal Plane Hip and Trunk Angles in Paraplegic Subjects Using Functional Neuromuscular Stimulation.*  
Advisor: Howard J. Chizeck, ScD

#### **ScB, Bio-electrical Engineering, 1982.**

Brown University, Providence, RI

### EXPERIENCE

- Aug '02 - present **Director and Co-Founder.**  
Center for Adaptive Neural Systems  
(formerly Center for Rehabilitation Neuroscience and Rehabilitation Engineering; co-directed with Ranu Jung through 2010)  
Arizona State University, Tempe, AZ.
- Aug '02 - present **Associate Professor.**  
School of Biological and Health Systems Engineering (SBHSE)  
(formerly Harrington Department of Bioengineering)  
Arizona State University, Tempe, AZ.
- Jan '10 - present **Member, Graduate Faculty.**  
Graduate Program in Mechanical Engineering  
School for Engineering of Matter, Transport & Energy  
Arizona State University, Tempe, AZ.

- Aug '08 - present **Member, Graduate Faculty.**  
Interdisciplinary Graduate Program in Neuroscience  
Arizona State University, Tempe, AZ.
- Aug '07 - present **Member, Honors Faculty.**  
Barrett, The Honors College at Arizona State University, Tempe, AZ.
- Sept '12 – May '19 **Adjunct Professor.**  
Department of Physical Therapy  
Arizona School of Health Sciences, A.T. Still University, Mesa, AZ.
- Aug '13 - Aug '14 **Visiting Professor.**  
Medical Devices Unit, Essential Medicines and Health Products Dept.  
World Health Organization, Geneva, Switzerland.
- Sept '00 - Dec '15 **Vice President and Co-Founder.**  
customKYnetics, Inc., Lexington, KY.
- Aug '02 - Aug '08 **Director of Clinical Rehabilitation Engineering.**  
Department of Clinical Neurobiology and Bioengineering  
Banner Good Samaritan Medical Center, Phoenix, AZ.
- Aug '02 - Aug '04 **Adjunct Associate Professor.**  
Center for Biomedical Engineering, University of Kentucky, Lexington, KY.
- July '00 - Aug '02 **Associate Professor.**  
Center for Biomedical Engineering, University of Kentucky, Lexington, KY.
- July '00 - Aug '02 **Joint Appointment as Associate Professor.**  
Department of Physical Medicine & Rehabilitation  
University of Kentucky, Lexington, KY.
- Nov '00 - Aug '02 **Affiliated Faculty.**  
Spinal Cord and Brain Injury Research Center,  
University of Kentucky, Lexington, KY.
- Aug '95 - June '00 **Assistant Professor.**  
Center for Biomedical Engineering, University of Kentucky, Lexington, KY.
- Aug '95 - June '00 **Joint Appointment as Assistant Professor.**  
Department of Physical Medicine & Rehabilitation  
University of Kentucky, Lexington, KY.
- Aug '93 - Aug '95 **Assistant Professor of Biomedical Engineering.**  
Department of Mechanical Engineering  
The Catholic University of America, Washington, DC.
- Sept '92 - Aug '93 **Adjunct Assistant Professor.**  
Systems Engineering Dept, Case Western Reserve University, Cleveland, OH.
- Sept '92 - July '93 **Biomedical Engineer.**  
Research Department, Shriners Hospital, Philadelphia, PA.

- May '86 - Aug '92 **Biomedical Research Engineer.**  
Motion Study Laboratory  
Cleveland Veterans Administration Medical Center, Cleveland, OH.
- Oct '85 - May '86 **Research Assistant.**  
Rehabilitation Engineering Center  
Metropolitan General Hospital, Cleveland, OH.
- July '82 - Oct '84 United States Peace Corps.  
**Teacher**, Marymount Secondary School, Mzuzu, Malawi.  
**Public Health Worker**, Chitipa District Hospital, Chitipa, Malawi.

## **HONORS**

- Aug '20 **Senior Member (elected)**, National Academy of Inventors (NAI)
- Aug '20 **Selected Participant**, National Institutes of Health, Concept to Clinic: Commercializing Innovation (C3i) Program
- April '19 **Outstanding Faculty Mentor Nominee**, Arizona State University Faculty Women's Association; nominated by a group of female faculty members in my unit.
- April '19 **Invited Participant**; Kavli Foundation/Materials Research Society "Workshop on Brain-Machine Interfaces"; Apr. 2019, Phoenix, AZ.
- Jan '19 **Nominee, Daniel Jankowski Legacy Award** that recognizes exemplary contributions in teaching, research, and public service.
- Jan '17 **Selected Team Participant**; National Academy of Engineering "Workshop on Overcoming Challenges to Infusing Ethics into the Development of Engineers"; Jan. 2017, Washington, DC.
- Mar '13 **Senior Member**, Institute of Electrical and Electronics Engineers (IEEE)
- 2012 **"Top Five Percent Faculty"**, Ira A. Fulton Schools of Engineering.  
In recognition of teaching excellence.
- May '12 **Thought Leader**, Vision Task Force, American Physical Therapy Association
- Nov '06 **Selected Participant**; National Academies Keck *Futures Initiative* Conference on "Smart Prosthetics: Exploring Assistive Devices for the Body and Mind"; Irvine, CA.
- June '00 **Invited Participant**, NIH-NINDS Workshop: "Functional and Dysfunctional Spinal Circuitry: Role for Rehabilitation and Neural Prostheses", UCLA, Los Angeles, CA

## **PROFESSIONAL INTERESTS**

Electrical stimulation of peripheral nerve for medical applications.  
Advanced prosthetic systems.  
Neurorehabilitation in spinal cord injury, Parkinson's disease, and cerebral palsy.  
Technology to promote neural plasticity.  
Adaptive biomimetic system design.  
Technology for global health.  
International programs for biomedical engineering education.

**PUBLICATIONS, INTELLECTUAL PROPERTY AND PRESENTATIONS****Legend:**

- \* Graduate Student (Abbas as mentor or co-mentor)
- # Undergraduate Student (Abbas as mentor or co-mentor)
- ∞ Other Student (Abbas on Committee)
- + Equal Contributions
- ~ Presenting author

**PEER-REVIEWED PUBLICATIONS**

1. N. Muthukrishnan\*, J.J. Abbas, H.A. Shill, and N. Krishnamurthi, "A Wearable Sensor System to Measure Step-Based Gait Parameters for Parkinson's Disease Rehabilitation", *Sensors*, (<http://dx.doi.org/10.3390/s20226417>), 2020.
2. R. Siu<sup>∞</sup>, J.J. Abbas, D.D. Fuller, J. Gomes, S. Renaud, and R. Jung, "Autonomous control of ventilation through closed-loop adaptive respiratory pacing", *Scientific Reports*, 10(1):21903, (<http://dx.doi.org/10.1038/s41598-020-78834-w>), 2020.
3. J. Stearns, J. Twaibu<sup>#</sup>, D. Kwaku<sup>#</sup>, V. Pizziconi, J. Abbas, A. Gotimukul, and D. Jaroscewski. "Efficacy of standard chest compressions in patients with Nuss bars", *J. Thoracic Dis.*, (<http://dx.doi.org/10.21037/jtd-20-702>), Vol. 12 (8), pp. 4299-4306, 2020.
4. N. Krishnamurthi, J. Fleury, M. Belyea, H. Shill, and J.J. Abbas. "ReadySteady Intervention to Promote Physical Activity in Older Adults with Parkinson's Disease: Study Design and Methods". *Contemporary Clinical Trials Communications*, Vol. 17 (<http://dx.doi.org/10.1016/j.conctc.2019.100513>), 2020.
5. R. Jung and J. Abbas, "Utilizing prosthetic technology to improve quality of life: an interview with Ranu Jung and James Abbas", *Bioelectronics in Medicine*, 2(3), (<https://doi.org/10.2217/bem-2020-0002>), 2020.
6. N. Muthukrishnan\*, J.J. Abbas, H.A. Shill, and N. Krishnamurthi, "Cueing Paradigms to Improve Gait and Posture in Parkinson's Disease: A Narrative Review", *Sensors*, (doi:10.3390/s19245468), 2019.
7. R. Siu<sup>∞</sup>, J.J. Abbas, B.K. Hillen, J. Gomes, S. Coxe, J. Castelli, S. Renaud, R. Jung, "Restoring ventilatory control using an adaptive bioelectronic system", *J Neurotrauma*, (<doi.org/10.1089/neu.2018.6358>), 2019.
8. A. Pena<sup>∞</sup>, L. Rincon-Gonzalez, J.J. Abbas, and R. Jung, "Effects of vibrotactile feedback and grasp interface compliance on perception and control of a sensorized myoelectric hand", *PLOS One* 14(1), e0210956. (<doi.org/10.1371/journal.pone.0210956>), 2019.
9. B.M. Bartels<sup>#</sup>, A. Moreno<sup>#</sup>, M.J. Quezada<sup>#</sup>, H. Sivertson<sup>#</sup>, J. Abbas, and N. Krishnamurthi, "Real-Time Feedback Derived from Wearable Sensors to Improve Gait in Parkinson's Disease", *Technology & Innovation*, Vol. 20, pp. 37-46 (<doi.org/10.21300/20.1-2.2018.37>), 2018.
10. R. Jung<sup>+</sup>, J.J. Abbas<sup>+</sup>, S Kuntaegowdanahalli, and A.K. Thota, "Bionic intrafascicular interfaces for recording and stimulating peripheral nerve fibers", *Bioelectronics in Medicine*, Vol. 1(1), pp. 55-69, (<doi.org/10.2217/bem-2017-0009>), 2018.

11. A.E. Pena<sup>∞</sup>, S. Kuntaegowdanahalli, J.J. Abbas, J. Patrick, K.W. Horch and R. Jung, "Mechanical fatigue resistance of an implantable branched lead system for a distributed set of longitudinal intrafascicular electrodes", *J Neural Eng*, Vol. 14, 066014, (doi.org/10.1088/1741-2552/aa814d), 2017.
12. O. Graudejus, T. Li, J. Cheng, N. Keiper<sup>#</sup>, R. Ponce Wong, A.B. Pak<sup>#</sup>, and J. Abbas, "The Effects of Bending on the Resistance of Elastically Stretchable Metal Conductors, and a comparison with stretching", *Appl. Phys. Lett.* **110**, 221906 (doi.org/10.1063/1.4984207), 2017.
13. J.J. Abbas, B. Smith, M. Poluta, A. Velazquez-Berumen, "Improving Health Care Delivery in Low-Resource Settings with Nanotechnology: Challenges in Multiple Dimensions", *Nanobiomedicine*, Vol 4, pp. 1-14. (doi.org/10.1177/1849543517701158), 2017.
14. M. Qiao<sup>∞</sup>, J. Abbas and D. Jindrich, "A model for differential leg joint function during human running", *Bioinspiration and Biomimetics*, Vol 12(1), (doi.org/10.1088/1748-3190/aa50b0), 2017.
15. C. Howard<sup>\*</sup>, C. Wallace, J. Abbas, and D. Stokic, "Residual Standard Deviation: Validation of a New Measure of Dual-Task Cost in Below-Knee Prosthesis Users", *Gait & Posture*, Vol 15, pp. 91-96, (doi.org/10.1016/j.gaitpost.2016.09.025), 2017.
16. N. Krishnamurthi, H. Shill, D. O'Donnell, P. Mahant, J. Samanta, A. Lieberman and J. Abbas, "Polestriding intervention improves gait and axial symptoms in mild to moderate Parkinson's disease", *Arch PM&R*, Vol. 98(4), pp. 613-621 (doi.org/10.1016/j.apmr.2016.10.002), 2017.
17. A. Zbrzeski, Y. Bornat, B. Hillen, R. Siu<sup>∞</sup>, J. Abbas, R. Jung, and S. Renaud, "Bio-inspired Controller on an FPGA applied to Closed-loop Diaphragmatic Stimulation", *Frontiers in Neuroscience*, Vol. 10, (doi.org/10.3389/fnins.2016.00275), 2016.
18. J. Jellish<sup>\*</sup>, J.J. Abbas, T. Ingalls, P. Mahant, J. Samanta, M.C. Ospina and N. Krishnamurthi, "A System for Real-Time Feedback to Improve Gait and Posture in Parkinson's Disease", *IEEE J Biomedical and Health Informatics*, vol.19, no.6, pp.1809-1819, (doi.org/10.1109/JBHI.2015.2472560), 2015.
19. B.K. Hillen<sup>∞</sup>, D.L. Jindrich, J.J. Abbas, G. T. Yamaguchi, and R. Jung, "Effects of Spinal Cord Injury Induced Changes in Muscle Activation on Foot Drag in a Computational Rat Ankle Model", *J Neurophys*, 113(7):2666-75, (doi.org/10.1152/jn.00507.2014), 2015.
20. A.K. Thota, S. Kuntaegowdanahalli, A.K. Starosciak, J.J. Abbas, J. Orbay, K.W. Horch, R. Jung, "A System and Method to Interface with Multiple Groups of Axons in Several Fascicles of Peripheral Nerves", *J. Neurosci Methods*, 44:78-84, (doi.org/10.1016/j.jneumeth.2014.07.020), 2015.
21. M.N. Abdelghani, J.J. Abbas, K.W. Horch, and R. Jung, "A Functional Model and Simulation of Spinal Motor Pools and Intrafascicular Recordings of Motoneuron Activity in Peripheral Nerve", *Front. Neurosci.*, 8:371. (doi.org/10.3389/fnins.2014.00371), 2014.
22. B.K. Hillen<sup>∞</sup>, J.J. Abbas and R. Jung, "Accelerating Locomotor Recovery After Incomplete Spinal Injury" *Annals NY Acad Sciences*, Vol. 1279, pp. 164-174, (doi.org/10.1111/nyas.12061), 2013.

23. B.K. Hillen<sup>∞</sup>, G. T. Yamaguchi, J.J. Abbas and R. Jung, "Joint-specific Changes in Locomotor Complexity in the Absence of Muscle Atrophy Following Incomplete Spinal Cord Injury, *J NeuroEngineering and Rehabilitation*, 10:97, (doi.org/10.1186/1743-0003-10-97), 2013.
24. A. Conovaloff\*, N. Krishnamurthi, P. Mahant, J. Samanta, J.J. Abbas, "The Effects of Deep Brain Stimulation Amplitude on Motor Performance in Parkinson's Disease", *J Parkinsonism & Restless Legs Syndrome*, Vol. 2, pp. 73-83, (doi.org/10.2147/JPRLS.S38263), 2012.
25. N. Krishnamurthi, S. Mulligan\*, P. Mahant, J. Samanta, J.J. Abbas, "Deep Brain Stimulation Amplitude Alters Posture Shift Velocity in Parkinson's Disease", *Cognitive Neurodynamics*, (doi.org/10.1007/s11571-012-9201-5), 2012.
26. R.J. Triolo, S. Nogan Bailey, M.E. Miller, L.M. Rohde, J.S. Anderson, J.A. Davis, Jr., J.J. Abbas, D.R. Gater, G.P. Forrest, L.A. DiPonio, L.J. Yang, "Longitudinal Performance of a Surgically Implanted Neuroprosthesis for Lower Extremity Exercise, Standing, and Transfers after Spinal Cord Injury", *Arch PM&R*, Vol. 93(5), pp. 896-904, (doi.org/10.1016/j.apmr.2012.01.001), 2012.
27. M.L. Boninger, J. French, J. Abbas, L Nagy, M. Ferguson Pell, S. Johnson Taylor, M. Rodgers, N. Saunders, P.H. Peckham, R. Marshall, and A. Sherwood, "Technology for Mobility in SCI Ten Years from Now", *Spinal Cord*, Vol. 50, pp. 358-363, (doi.org/10.1038/sc.2011.165), 2012.
28. M. Fairchild<sup>∞</sup>, S.J. Kim, A. Iarkov, J.J. Abbas, R. Jung, "Repetitive Hindlimb Movement Using Intermittent Adaptive Neuromuscular Electrical Stimulation in an Incomplete Spinal Cord Injury Rodent Model", *Exp Neurol*. Vol. 223(2), pp. 623-33, (doi.org/10.1016/j.expneurol.2010.02.011), 2010.
29. R. Jung, A. Belanger<sup>∞</sup>, T. Kanchiku, M. Fairchild<sup>∞</sup>, and J.J. Abbas, "Neuromuscular Stimulation Therapy After Incomplete Spinal Cord Injury Promotes Recovery of Locomotor Control", *J. Neural Eng.*, Vol. 6(5), (doi.org/10.1088/1741-2560/6/5/055010), 2009.
30. R. Jung, K. Ichihara, G. Venkatasubramanian<sup>∞</sup> and J.J. Abbas, "Chronic Neuromuscular Electrical Stimulation of Paralyzed Hindlimbs in a Rodent Model", *J. Neuroscience Methods*, Vol. 183(2), pp. 241-54, (doi.org/10.1016/j.jneumeth.2009.06.043), 2009.
31. A. Downing\*, K. Ganley, D.R. Fay, and J.J. Abbas, "Temporal Characteristics of Lower Extremity Moment Generation in Children with Cerebral Palsy", *Muscle & Nerve*, 29, pp. 800-809, (doi.org/10.1002/mus.21231), 2009.
32. S. J. Kim, M. Fairchild<sup>∞</sup>, A. Iarkov, J.J. Abbas, and R. Jung, "Adaptive Control of Movement for Neuromuscular Stimulation-assisted Therapy in a Rodent Model", *IEEE Trans. Biomed. Eng.*, Vol. 56(2), pp. 452-461, (doi.org/10.1109/TBME.2008.2008193), 2009.
33. K. Ichihara, G. Venkatasubramanian<sup>∞</sup>, J.J. Abbas, and R. Jung. "Neuromuscular Electrical Stimulation of the Hindlimb Muscles for Movement Therapy in a Rodent Model". *J Neurosci Methods*, Vol. 176(2), pp. 213-224, (doi.org/10.1016/j.jneumeth.2008.09.015), 2009.
34. J.C. Gillette, C. A. Stevermer, N.E. Quick, and J.J. Abbas, "Alternative Foot Placements for Individuals with Spinal Cord Injuries Standing with the Assistance of Functional Neuromuscular Stimulation", *Gait and Posture*, Vol. 27(2), pp.280-285, (doi.org/10.1016/j.gaitpost.2007.04.005), 2008.

35. T.J. Kanchiku, J.V. Lynskey, D. Protas<sup>∞</sup>, J.J. Abbas and R. Jung. "Neuromuscular Electrical Stimulation Induced Forelimb Movement in a Rodent Model", *J. Neurosc. Methods*, Vol. 167(2), pp. 317-26, (doi.org/10.1016/j.jneumeth.2007.08.002), 2008.
36. J.C. Gillette and J.J. Abbas, "Foot Placement Alters the Mechanisms of Postural Control While Standing and Reaching", *IEEE Trans. Neural Systems & Rehab*, Vol. 11(4), pp. 377-385, 2003.
37. J.C. Gillette, N.E. Quick, and J.J. Abbas, "Center of Pressure Measures to Assess FNS Standing Performance" *Biomedical Sci Instrum*, Vol. 38, pp. 239-244, 2002.
38. J.A. Riess\*, and J.J. Abbas, "Adaptive Control of Cyclic Movements as Muscles Fatigue Using Functional Neuromuscular Stimulation", *IEEE Trans. Rehab. Eng.* Vol. 9(3), pp. 326-330, 2001.
39. J.J. Abbas and R. Riener, "Using Mathematical Models and Advanced Control Systems Techniques to Enhance Neuroprosthesis Function", *Neuromodulation*, Vol. 4(4), pp. 187-195, 2001.
40. R. Jung, E.J. Brauer, and J.J. Abbas, "Real-time Interaction Between a Neuromorphic Electronic Circuit and the Spinal Cord", *IEEE Trans. Rehab. Eng.* Vol. 9(3), pp. 319-326, 2001.
41. J.J. Abbas and J.C. Gillette, "Approaches to Control Standing Posture using Electrical Stimulation", *IEEE Control Systems Mag.* Vol. 21(4), pp. 80-90, 2001.
42. E. Stites<sup>#</sup> and J.J. Abbas, "Sensitivity and Versatility of an Adaptive System for Controlling Cyclic Movements Using Functional Neuromuscular Stimulation", *IEEE Trans. Biomed. Eng.* Vol. 47(9), pp. 1287-1292, 2000.
43. J.A. Riess\* and J.J. Abbas, "Adaptive Neural Network Control of Cyclic Movements Using Functional Neuromuscular Stimulation", *IEEE Trans. Rehab. Eng.*, Vol. 8(1), pp. 42-52, 2000.
44. D.R. Gater, S.M. McDowell, and J.J. Abbas, "Electrical Stimulation: A Societal Perspective", *Assistive Technology*, Vol. 12, pp. 85-91, 2000.
45. S. Grandhe<sup>∞</sup>, J.J. Abbas and R. Jung, "Brain-Spinal Cord Interactions Stabilize the Locomotor Rhythm to an External Perturbation", *Biomedical Sci Instrum*, Vol. 35, pp. 175-180, 1999.
46. J.J. Abbas and R.J. Triolo, "Experimental Evaluation of an Adaptive Feedforward Controller for Use in Functional Neuromuscular Stimulation Systems", *IEEE Trans. Rehab. Eng.*, Vol. 5(1), pp. 12-22, 1997.
47. J.A. Riess\* and J.J. Abbas, "Evaluation of FNS Control Systems: Software Development and Sensor Characterization", *Biomedical Sci Instrum*, Vol. 33, pp. 197-202, 1997.
48. P.E. Crago, N. Lan, P.H. Veltink, J.J. Abbas and C. Kantor, "New Control Strategies for Neuroprosthetic Systems", *J. Rehab. Res. & Devel.*, Vol. 33(2), pp.158-172, 1996.
49. J.J. Abbas and H.J. Chizeck, "Neural Network Control of Functional Neuromuscular Stimulation Systems: Computer Simulation Studies", *IEEE Trans. Biomed. Eng.*, Vol. 42(11), pp. 1117-1126, 1995.
50. J.J. Abbas and H.J. Chizeck, "Feedback Control of Coronal Plane Hip Angle Using Functional Neuromuscular Stimulation", *IEEE Trans. Biomed. Eng.*, Vol. 38(7), pp. 687-698, 1991.

51. H.J. Chizeck, R. Kobetic, E.B. Marsolais, J.J. Abbas, I.H. Donner and E. Simon, "Control of Functional Neuromuscular Stimulation Systems for Standing and Locomotion in Paraplegics", *Proceedings of the IEEE*, Vol. 76(9), pp. 1155-1165, 1988.

#### **PATENTS ISSUED**

1. "Directional-Specific Extraneural Recording Device", i. Black<sup>∞</sup>, J. Abbas, R. Jung. U.S. Patent No. 10,660,535 B2, 2020.
2. "Neural Interface Activity Simulator", M. Abdelghani, R. Jung, J.J. Abbas, and K. Horch. U.S. Patent No. 9,563,740 B2, 2017.
3. "Systems and Methods for Decoding Intended Motor Commands from Recorded Neural Signals for the Control of External Devices or to Interact in Virtual Environments", M. Abdelghani, R. Jung, J. Abbas, and K. Horch. U.S. Patent No. 9,717,440 B2, 2017.
4. "Modular Multi-Channel Inline Connector System", S. Kuntaegowdanahalli, J.J. Abbas, R. Jung, and K. Horch. U.S. Patent No. 9,427,565 B2, 2016.
5. "Communication Interface for Sensory Stimulation". R. Jung, K. Horch, J.J. Abbas, S. Phillips, B. Bakaloglu, & S. Kim. U.S. Patent No. 9,026,224 B2, 2015.
6. "Lower Extremity Exercise Device with Stimulation and Related Methods", E. Hartman, J. Abbas, J. Resig, J. Alton, N. Quick & M. Griffin. U.S. Patent No. 8,249,714 B1, 2012.

#### **PATENT APPLICATIONS AND PROVISIONAL PATENTS FILED**

1. "Systems and Methods for Delivering Focalized Neurostimulation", A. Pena Serrada<sup>∞</sup>, R. Jung, J. Abbas, and K. Horch. U.S. Patent Application No. PCT/63/149,015, 2021.
2. "Non-invasive Intraoral Neurostimulation Device for Obstructive Sleep Apnea", S. Lane<sup>#</sup>, C. Rowan<sup>#</sup>, A. Sira<sup>#</sup>, K. Starkel<sup>#</sup>, and J. Abbas. U.S. Patent Application No. PCT/62/839,302, 2019.
3. "Systems and Methods for Advanced Medical Device Placement and Usage", B. Kelly, A. Newcomb\*, W. Langenbach<sup>#</sup>, K. Jefferys<sup>#</sup>, L. Tumialan, and J. Abbas. U.S. Patent Application No. PCT/ 62/463,765, 2018.
4. "Autoinjection Stabilization Device", Q. Woods<sup>#</sup>, A. Bugarin<sup>#</sup>, J. Sherman<sup>#</sup>, and J. Abbas. U.S. Provisional Patent Application No. PCT/62/568,181, 2017.
5. "Systems and Methods for a Resistive Microcracked Pressure Sensor", O. Graudejus and J. Abbas. U.S. Patent Application No. PCT/14/243,563, 2014.
6. "Fitting System for a Neural Enabled Limb Prosthesis System", S. Kuntaegowdanahalli, R. Jung, J. Abbas, and K. Horch. U.S. Patent Application No. PCT/14/216,826, 2014.
7. "Method for Mapping Sensor Signals to Output Channels for Neural Activation", R. Jung, J. Abbas, B.P. Smith, and K. Horch. U.S. Patent Application No. PCT/14/181,172, 2014.
8. "Method for Scheduling Pulses to Achieve Multi-Channel Pulse Frequency Modulation", J. Abbas, B.P. Smith, B. Swanson, K. Horch, and R. Jung. U.S. Provisional Patent Application No. 61/765,545, 2013.
9. "Self-Anchoring MEMS Intrafascicular Neural Electrode", R. Jung, S. Phillips, and J. Abbas, U.S. Patent Application No. PCT/12/669,761, 2010.



**PEER-REVIEWED AND INVITED BOOK CHAPTERS**

1. J.J. Abbas and A. Abraham\*, "Biomimetic Approaches to Physiological Control" in Biomedical Engineering Fundamentals: The Biomedical Engineering Handbook, 4<sup>th</sup> Edition, Ed. J.D. Bronzino, CRC Press, Inc., Boca Raton, FL, 2015. (*Invited Chapter*).
2. J.J. Abbas, "Models of Neuromuscular Control Systems" in Encyclopedia of Computational Neuroscience, Ed. D. Jaeger and R. Jung, Springer, 2014. (*Invited Chapter*).
3. M. Abdelghani, J.J. Abbas, and R. Jung, "Peripheral Nerve Interface Applications, EMG/ENG" in Encyclopedia of Computational Neuroscience, Ed. D. Jaeger and R. Jung, Springer, 2014. (*Invited Chapter*).
4. J.J. Abbas, "Biomimetic Adaptive Control Algorithms" in Biohybrid Systems: Nerves, Interfaces, and Machines, First Edition. Edited by Ranu Jung, Wiley-VCH Verlag GmbH & Co. KGaA., pages 141-157. 2011 (*Invited Chapter*).
5. J.J. Abbas, "Neural Networks for Physiological Control" in Biomedical Engineering Fundamentals: The Biomedical Engineering Handbook, 3<sup>rd</sup> Edition, Ed. J.D. Bronzino, CRC Press, Inc., Boca Raton, FL, 2006. (*Invited Chapter*).
6. J.J. Abbas, "Neural Networks for Physiological Control" in Handbook of Biomedical Engineering, 2<sup>nd</sup> Edition Vol II, CRC Press, Inc., Boca Raton, FL, pp. 162.1-162.10, 2000. (*Invited Chapter*).
7. J.J. Abbas and R.J. Full, "Neuromechanical Interaction in Cyclic Movements" in Biomechanics and Neural Control of Movement, Ed. by J.M. Winters and P.E. Crago, Springer-Verlag, pp. 177-191, 2000. (*Invited Didactic Chapter*).
8. S.P. Jayasundera\* and J.J. Abbas, "Control of Rhythmic Movements using FNS" in Biomechanics and Neural Control of Movement, Ed. by J.M. Winters and P.E. Crago, Springer-Verlag, pp. 632-641, 2000.
9. H. Dou, Z. Zhou, Y. Chen, J. Xu and J.J. Abbas, "Robust Control of Functional Neuromuscular Stimulation Systems by Discrete-time Iterative Learning" in Recent Advances in Iterative Learning Control, Ed. by Z. Bien and J. Xu, Kluwer Academic Pub., pp. 351-370, 1998, (*Invited Chapter*).
10. J.J. Abbas, "Using Neural Models in the Design of a Movement Control System", in Computational Neuroscience, Ed. J. Bower, Academic Press, New York, pp. 305-310, 1996.
11. J.J. Abbas, "Neural Networks for Physiological Control" in CRC Handbook of Biomedical Engineering, CRC Press, Inc., Boca Raton, FL, pp. 2422-2431, 1995 (*Invited Chapter*).

### **CONTRIBUTIONS TO PUBLICATIONS OF THE WORLD HEALTH ORGANIZATION (WHO)**

*(The WHO does not list individual authors on published reports. During the time of my service at the WHO and in the years that followed, I played a major role in two projects and in developing the following reports on those projects.)*

1. "Towards improving access to medical devices through local production: phase II: report of a case study in four sub-Saharan countries", World Health Organization, Geneva, Switzerland, 2016.
2. "Second WHO Global Forum on Medical Devices: Priority Medical Devices for Universal Health Coverage" in Geneva, Switzerland, 2013. (report published by the World Health Organization, 2014).

### **PEER-REVIEWED CONFERENCE PUBLICATIONS**

1. N. Muthukrishnan\*~ , A.A. Mevawala, H.A. Shill, J.J. Abbas, N. Krishnamurthi, "Real-Time Gait and Posture Measures from Wearable Sensors for Rehabilitation in Parkinson's Disease", American Society of Neurorehabilitation, 2021. (in review).
2. G. Kaplan#~ , T. McDaniel, J. Abbas, R. Tadayon, and S. Panchanathan, "A Time-Discrete Haptic Feedback System for Use by Lower-Limb Amputees During Gait", HCI International, Orlando, FL, 2019.
3. R. Siu~~ , J. Abbas, B. Hillen, and R. Jung, "Computational assessment of a neuromorphic closed-loop controller for ventilatory pacing", BMES Conf., Atlanta, GA, 2018.
4. R. Jung~ , R. Siu† , J. Abbas, Sylvie Renaud, Yannick Bornat, and Brian Hillen, "Targeting the neural innervation for ventilatory control", IEEE-EMBC, Honolulu, HI, 2018.
5. J. Abbas, K. Sathyakumar, A. Thota, A. Pena~ , R. Jung~ , "Development of a sensory-enabled neuroprosthetic hand system", Military Health System Research Symposium, Orlando, FL, 2018.
6. R. Siu~~ , J. Abbas, B. Hillen, S. Renaud, and R. Jung "Computational validation of a closed loop neuromorphic controller for ventilatory control", Annual Computational Neuroscience Meeting CNS\*2018, Seattle, WA, 2018.
7. D. Baskaran\*~ , N. Krishnamurthi, P. Mahant, M.C. Ospina, and J. Abbas, "Real-Time Feedback Training to Improve Gait and Posture in Parkinson's Disease", BMES Conf., Phoenix, AZ, 2017.
8. W. Langenbach#~ , K. Jefferys# , B. Kelly, J. Abbas, A. Newcomb\* , L. Tumialan, "Real Time Angle Measuring Tool for Lumbar Spinal Fusion", BMES Conf., Phoenix, AZ, 2017.
9. R. Siu~~ , J. Abbas, B. Hillen, and R. Jung, "A neuromorphic system for adaptive closed-loop control of ventilation after spinal cord injury", BMES Conf., Phoenix, AZ, 2017.
10. J. Castelli~ , F. Kolbl, R. Siu~ , G. N'Kaoua, Y. Bornat, A. Mangalore, B. Hillen, J.J. Abbas, S. Renaud, R. Jung, and N. Lewis, "An IC-based controllable stimulator for respiratory muscle stimulation investigations", 39<sup>th</sup> Annual IEEE-EMBS Conference, Jeju Island, South Korea, 2017.

11. A. Pak<sup>#</sup>, R.D. Ponce-Wong, J. Abbas, O. Graudejus, "Rupture Characteristics of Elastically Stretchable Microcracked Gold Conductors for Stretchable Microelectrode Array Applications", Materials Research Society Spring Meeting, Phoenix, AZ, 2017.
12. N. Krishnamurthi<sup>~</sup>, P. Herrera<sup>\*</sup>, P. Mahant, C. Honeycutt, and J.J. Abbas "Effects of Split-Belt Treadmill Training on Gait in People with Parkinson's Disease", American Society of Neurorehabilitation, San Diego, CA, 2016.
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14. i. Black<sup>∞</sup>, J. Abbas, and R. Jung, "Predicted Effect of Electrode Position on the Amplitude of Recorded Neural Signals Using Cuff-Like Technologies", Neural Interfaces Conf., Baltimore, MD, 2016.
15. T. Nguyen<sup>#</sup>, A. Pak<sup>#</sup>, O. Graudejus, J. Abbas, "Resistance Changes and Shear Forces upon Bending in Stretchable Interconnects", Materials Research Society Spring Meeting, Phoenix, AZ, 2016.
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#### **ABSTRACTS**

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29. N. Krishnamurthi<sup>~</sup>, A. Sitek<sup>\*</sup>, P. Mahant, J. Samanta, and J. J. Abbas, "Effects of Deep Brain Stimulation Amplitude on Gait in Parkinson's Disease" Society for Neuroscience 37<sup>th</sup> Annual Meeting, San Diego, CA, 2007.
30. M. Bhowmik-Stoker<sup>\*~</sup>, R. Herman, S, Allison, and J. J. Abbas, "Adaptive control of electrical stimulation to supplement locomotor retraining after spinal cord injury" Society for Neuroscience 37<sup>th</sup> Annual Meeting, San Diego, CA, 2007.
31. A.L. Downing<sup>\*~</sup>, D.R. Fay, and J.J. Abbas, "Force Coordination Training in Children with Spastic Diplegia", Society for Neuroscience 37<sup>th</sup> Annual Meeting, San Diego, CA, 2007.
32. B.K. Hillen<sup>~</sup>, J.J. Abbas, G. Yamaguchi and R. Jung, "Effects of spinal cord injury on musculoskeletal parameters in the rodent.", Society for Neuroscience 37<sup>th</sup> Annual Meeting, San Diego, CA, 2007.
33. S. Allison<sup>\*~</sup>, M. Bhowmik<sup>\*</sup>, D. Channer, R. Herman, J. J. Abbas, "Selecting suitable movement patterns for locomotor retraining using partial weight bearing therapy" Society for Neuroscience 36<sup>th</sup> Annual Meeting, Atlanta, Georgia, 2006.
34. A. J. Sitek<sup>\*~</sup> J. J. Abbas, D. M. Lieberman, P. Mahant, J. Samanta, "Location and orientation of active contacts in deep brain stimulation systems", Society for Neuroscience 36<sup>th</sup> Annual Meeting, Atlanta, Georgia, 2006.
35. R. Jung<sup>~</sup>, A. Belanger<sup>~</sup>, T. Kanchiku, J. Lynskey, M. Mukherjee<sup>~</sup>, D. Hagner, J.J. Abbas, "Hindlimb neuromuscular stimulation therapy after thoracic contusion injury promotes locomotor recovery", 11th Annual Conference of the International Functional Electrical Stimulation Society, Miyagi-Zhao, Japan, 2006.
36. T. Kanchiku<sup>~</sup>, J.V. Lynskey, T. Tagachi, J.J. Abbas, R. Jung, "Rodent model for forelimb neuromuscular stimulation based movement therapy". 11th Annual Conference of the International Functional Electrical Stimulation Society, Miyagi-Zhao, Japan, 2006.
37. A. Sitek<sup>\*~</sup>, D. Liberman, and J.J. Abbas, "DBS Electrode Location and Clinical Outcomes in Parkinson's Disease", American Society of Stereotactic and Functional Neurosurgery, Boston, MA, 2006.
38. K. Narayanan<sup>~</sup>, S. Mulligan<sup>\*</sup>, P. Mahant, J. Samanta and J.J. Abbas, "Deep Brain Stimulation Effects on Posture Control in Parkinson's Disease", World Parkinson Congress, Feb., 2006, Washington D.C. Abstract published in Movement Disorders, Vol. 21/Supp. 13, 2006, Abstract No. P209, Page. S115.
39. S. Mulligan<sup>\*~</sup>, K. Narayanan, P. Mahant, J. Samanta and J.J. Abbas, "Effect of deep brain stimulation on posture control in Parkinson's disease", 9<sup>th</sup> International Congress of Parkinson's disease and Movement Disorders, New Orleans, LA, 2005.
40. J.V. Lynskey<sup>~</sup>, A. Belanger<sup>~</sup>, T. Kanchiku, G. Venkatasubramanian, M. Mukherjee<sup>~</sup>, A. Thota, J. Abbas, R. Jung. "Therapeutic Neuromuscular Stimulation Therapy Improves Recovery of Locomotion after Incomplete Spinal Cord Injury in Adult Rats". 11<sup>th</sup> International Symposium on Neural Regeneration, Asilomar, CA, 2005.

41. G. Venkatasubramanian<sup>~</sup>, T. Kanchiku, M. Mukherjee<sup>~</sup>, J.J. Abbas, R. Jung. "Functional neuromuscular stimulation after spinal cord injury: a rodent model". 23<sup>rd</sup> Annual National Neurotrauma Society Meeting, Washington DC, Nov 10-11, 2005.
42. M. Mukherjee<sup>~</sup>, A. Belanger<sup>~</sup>, T. Kanchiku, J. Lynskey, A. Thota, J.J. Abbas, R. Jung. "Functional neuromuscular stimulation after incomplete spinal cord injury in rodents promotes recovery of locomotion". 23<sup>rd</sup> Annual National Neurotrauma Society Meeting, Washington DC, 2005.
43. K. Kanchiku<sup>~</sup>, A. Belanger<sup>~</sup>, G. Venkatasubramanian<sup>~</sup>, M. Mukherjee<sup>~</sup>, J.V. Lynskey, A. Thota, J. Abbas, R. Jung. "Functional Neuromuscular Stimulation Therapy Promotes Recovery of Locomotion after Incomplete Spinal Cord Injury in Adult Rats". Cervical Spine Research Society 33rd Annual Meeting, San Diego, CA, 2005.
44. A. Belanger<sup>~</sup>, T. Kanchiku, M. Mukherjee<sup>~</sup>, J. Lynskey, J.J. Abbas, R. Jung. "A Rodent Model of Functional Neuromuscular Stimulation Therapy after Incomplete Spinal Cord Injury", Society for Neuroscience Annual Meeting, Washington DC. 2005.
45. G. Venkatasubramanian<sup>~</sup>, T. Kanchiku, M. Mukherjee<sup>~</sup>, J.J. Abbas, R. Jung. "Functional Neuromuscular Stimulation (FNS) Assisted Locomotion in a Paraplegic Rodent", Society for Neuroscience Annual Meeting, Washington DC. 2005.
46. G. Venkatasubramanian<sup>~</sup>, K. Ichihara, J.J. Abbas, R. Jung. "Functional Neuromuscular Stimulation in a Paraplegic Rodent Model: Electrode Design, Implantation and Assessment", (presentation at the 22<sup>nd</sup> National Neurotrauma Society, San Diego, CA) *J. Neurotrauma* 21(9):P225, pg. 1320 2004.
47. K. Ichihara<sup>~</sup>, G. Venkatasubramanian<sup>~</sup>, J.J. Abbas, R. Jung. 'Electrical stimulation paradigms to assist in locomotor training after spinal cord injury'. (presentation at the National Neurotrauma Society, Biloxi, MS), *J. Neurotrauma*, 20(10):P412 pg.1131, 2003.
48. V.Krishnamohan<sup>~</sup>, J.J.Abbas, G.T.Yamaguchi, R.Jung, "Biomechanical Model of an Unloaded Rat Hindlimb", *Soc. Neurosci. Abs.*, 2003.
49. J.C. Gillette<sup>~</sup>, N.E. Quick, J.J. Abbas, "Hand Support Forces When Using Functional Neuromuscular Stimulation to Assist in Standing", *Proc. ACSM*, 2003.
50. N. Ravi<sup>~</sup>, V. Booth, J.J. Abbas and R. Jung, "A two-compartment vertebrate motoneuron model to investigate effects of afferent nerve stimulation", *Soc. Neurosci. Abs.*, 2002.
51. A. Thota<sup>~</sup>, R. Jung and J.J. Abbas, "Adaptive control of endpoint position by weighted activation of force fields", *Annals BME Suppl.*, 2001.
52. S. Grandhe<sup>~</sup>, J.J. Abbas and R. Jung. "Periodic perturbation effects on locomotor rhythm and motor pattern generation in the lamprey". *Soc. for Neuroscience Abstracts*, 26(2):834.1, 2000.
53. R. Jung<sup>~</sup>, E.J. Brauer and J.J. Abbas, "A Real-time Neuromorphic Analog VLSI-Spinal Cord Interface for Rhythmic Motor Control", *Soc. for Neuroscience Abstracts*, Vol. 25, 422.3, p. 1038, 1999.
54. J.A. Riess<sup>~</sup>, J.D. Neiser<sup>#</sup>, E. Hartman<sup>\*</sup> and J.J. Abbas, "Evaluation of Input Devices for Use in Functional Neuromuscular Stimulation", *Annals BME Suppl.*, pp. S-132, 1998.

55. X. Zhang\*~ , J.J. Abbas and R.J. Triolo, "The Effects of Co-stimulation Map Parameters on FNS System Performance", *Annals BME Suppl.*, pp. S-133, 1998.
56. P. Kataria\*~ and J.J. Abbas, "Estimating Body Segment Orientation Using a Lightweight, Inexpensive Gyroscope", *Annals BME Suppl.*, pp. S-133, 1998.
57. E. Hartman\*~ and J.J. Abbas, "Time Delays and Model Reference Adaptive Control in Function Neuromuscular Stimulation", *Annals BME Suppl.*, pp. S-133, 1998.
58. R. Jung~ , J.J. Abbas and E.J. Brauer, "Entrainment of An Analog VLSI Model of Lamprey Unit Pattern Generator", *Annals BME Suppl.*, pp. S- 99, 1998.
59. L. Knapp~ , J. Atchison, R. Shapiro, R. Salcido and J.J. Abbas, "Electromyographic and Kinematic Analysis of the Painful Hemiplegic Shoulder Before and After Subscapularis Motor Point Block", *Proc. AAPM&R*, (Chicago), 1996.
60. E. Stites#~ and J.J. Abbas, "Parameter Selection in an Adaptive Control System for Biomedical Applications", *KY Acad. Sciences*, (Frankfort, KY), 1996.
61. L. Knapp~ , J. Atchison, R. Shapiro, R. Salcido and J.J. Abbas, "Electromyographic and Kinematic Analysis of the Painful Hemiplegic Shoulder Before and After Subscapularis Motor Point Block", *Gait and Posture*, Vol. 4, p. 182, 1996.
62. J.J. Abbas~ and S.P. Jayasundera\* , "Adaptive Control of Movement Using Models of Neural Circuitry", *Soc. for Neuroscience Abstracts*, p. 147, (San Diego, CA), 1995.
63. S.P. Jayasundera\*~ and J.J. Abbas, "Adaptive Neural Network Control of a Stepping Movement in a Three Segment Model", *Proc. BMES Society Conf .*, (Phoenix, AZ), 1994.
64. J.J. Abbas~ and H.J. Chizeck, "Processing Skin Stretch Sensor Measurements of Hip and Trunk Angles", in *Proc. 40<sup>th</sup> ACEMB Conf.* (Niagara Falls, NY), pp. 222, 1987.

#### **INVITED PRESENTATIONS AT NATIONAL/INTERNATIONAL MEETINGS**

1. "Academia Contributions in NetHealth", panelist in the NetHealth Workshop of the 13th International Conference on COMMunication Systems and NETWORKS (COMSNETS), (Bangalore, India and virtual), Jan. 2021.
2. "Neurotechnology to Activate Peripheral Nerves: Providing Task-relevant Sensations to Prosthesis Users", presented at the Indo-US Conference on Bioengineering and Regenerative Medicine, (Varanasi, India), Feb. 2020.
3. "Adaptive Neural Stimulation for Control of Respiration", presented in a session on "Spinal Cord Lesions and Clinical Motor Control" at Progress in Clinical Motor Control I: Neurorehabilitation, (State College, PA), July 2018.
4. "Challenges for Clinical Deployment for Long-term Use of Neural Interfaces", presented at a Mini-Symposium on Challenges for Chronic Neural Prosthetics at IEEE EMBC Conf., (Chicago, IL), Aug. 2014.
5. "Local Production of Medical Devices in Sub-Saharan Africa: Characterizing the Landscape and Assessing Feasibility", Workshop presentation at the 2<sup>nd</sup> WHO Global Forum on Medical Devices, presented with M. Poluta, A. Sabet Sarvastani, and A. Velazquez-Berumen, (Geneva, Switzerland), Nov. 2013.

6. "Smart Hybrid Biosystems in Prosthetics and Rehabilitation", IEEE BioCAS 2010, (Paphos, Cyprus), Nov. 2010.
7. "Neural Oscillators and Cyclic Movements", Organization for Computational Neurosciences, CNS\*2010, (San Antonio, TX), July 2010.
8. "Adaptation in the FES Device and in the Nervous System", Contemporary Forums on Spinal Cord Injuries, (Boston, MA), May 2010.
9. "Neuromorphogenic Adaptation", presented at Institute for Neuromorphic Engineering 15<sup>th</sup> Annual Workshop (Telluride, CO), July 2008.
10. "Adaptive Neural Systems", presented at the 3<sup>rd</sup> International Conference on Body Area Networks, (Tempe, AZ), March 2008.
11. "Personalized neuromuscular electrical stimulation for exercise or neuromotor therapy", J. Abbas, 30th Annual Meeting of the Mid-Atlantic Regional Chapter of the American College of Sports Medicine (Harrisburg, PA), Nov. 2007.
12. "Neuromorphic Design of Smart Prosthetic and Therapeutic Systems", presented at Institute for Neuromorphic Engineering 14<sup>th</sup> Annual Workshop (Telluride, CO), July 2007.
13. "Smart Prosthetics" presentation the Board of the National Academies and to the Beckman Center Advisory Board, (Irvine, CA), Feb. 2007.
14. "Control of movement using electrical stimulation of paralyzed muscles: a medical problem suited for a neuromorphic solution?" presented at the Institute for Neuromorphic Engineering Workshop, (Zurich, Switzerland), 2005.
15. "Functional Neuromuscular Stimulation", presented at *1st Annual Neurorehabilitation Symposium, "Clinical Advances in Neurorehabilitation Science"*, (Lexington, KY), Sept. 2001.
16. "Using Mathematical Models and Advanced Control Systems Techniques to Enhance Neuroprosthesis Function", presented with R. Riener at *6<sup>th</sup> Annual Conference of the International Functional Electrical Stimulation Society*, (Cleveland, OH), June 2001.
17. "Adaptive Algorithms to Custom-fit the Neuroprosthesis to the User", presented at the *NIPS\*2000 Workshop*, (Breckenridge, CO), Dec. 2000.
18. "Neural Networks for Control of Posture and Locomotion", presented at the *American Control Conference*, (Albuquerque, NM), June 1997.
19. "Justifying Technology in the Managed Care Environment", presented at *9<sup>th</sup> Annual Interdisciplinary Rehabilitation Conference*, (Lexington, KY), Aug. 1996.
20. "Application of Neural Pattern Generators for the Restoration of Motor Function using Functional Neuromuscular Stimulation", presented at *Biomechanics & Neural Control of Movement Conference* (Mt. Sterling, OH), June 1996.
21. "Functional Electrical Stimulation Ambulation Techniques", presented at *Spinal Cord Injury: Issues and Advances*, (Washington, DC), Nov. 1994.
22. "The Use of Neural Network Algorithms in Functional Neuromuscular Stimulation Control Systems", presented at *Neural Prostheses: Motor Systems IV Conference* (Mt. Sterling, OH), July 1994.

**INVITED PRESENTATIONS** (external, local)

1. "Research Strategies", (co-organized and presented at this workshop), Ashesi University, (Accra, Ghana), June 2019.
2. "Team-based Research", (co-organized and presented at this workshop), Kwame Nkrumah University of Science and Technology (KNUST), (Kumasi, Ghana), June 2019.
3. "Problem-Based Learning – Capstone Design", Kwame Nkrumah University of Science and Technology (KNUST), (Kumasi, Ghana), March 2018.
4. "Adaptive control of movement: providing sensory information to improve neuromotor function", Division of Physical Medicine & Rehabilitation, University of Alberta (Edmonton, Alberta, CA), Dec. 2018.
5. "Problem-Based Learning", Kwame Nkrumah University of Science and Technology (KNUST), (Kumasi, Ghana), March 2017.
6. "Adaptive closed-loop neuromotor control after spinal cord injury", The Cuban Neuroscience Center (CNEURO), (Havana, Cuba), November 2016.
7. "Neurotechnology and Interactive Rehabilitation for Sensorimotor Restoration", Tel Aviv Sourasky Medical Center (Tel Aviv, Israel), May 2016.
8. "Spinal cord injury research: Emerging technologies to promote recovery, enhance function and improve health after SCI", Barrow Spinal Cord Injury Symposium, (Phoenix, AZ), Feb. 2015.
9. "Modeling World Health Organization Prototypes to Pursue the Development and Production of a Medical Device Industry in Uganda: Identifying Challenges and Seizing Opportunities", Uganda Biomedical Braintrust Meeting, (Miami, FL), Sept. 2014.
10. "The Role of Physical Activity and the Use of Adaptive Technology in the Treatment of Non-Communicable Diseases", Indian Institute of Technology – Delhi, (New Delhi, India), March 2014.
11. "Improving access to quality healthcare using medical technology", World Health Organization, (Geneva, Switzerland), Nov. 2013.
12. "Adaptive Technology, Neural Adaptation and Rehabilitation", Institute of Biomaterials and Biomedical Engineering, University of Toronto, (Toronto, Canada), Apr. 2011.
13. "Adaptive Technology to Promote Neural Adaptation", The Miami Project, (Miami, FL), Mar. 2011.
14. "Neural Systems, Rehabilitation Engineering, and Adaptive Processes", Paradise Valley Hospital, (Phoenix, AZ), May 2010.
15. "Promoting Neural Adaptation Using Adaptive Technology", Dept. of Kinesiology, University of Maryland, (College Park, MD), Oct. 2009.
16. "Adaptive Biomimetic Technology to Promote Neural Adaptation", Biomedical Distinguished Lecture Series, National Centre for Biomedical Engineering Science, National University of Ireland, Galway, (Galway, Ireland), July 2009.
17. "Neuromorphic Design of Adaptive Systems for Neuromotor Rehabilitation", Department of Mechanical Engineering, University of Florida, (Gainesville, FL), Feb. 2009.

18. "Personalized Technology for Neuromotor Therapy", Department of Physical Therapy, University of Florida, (Gainesville, FL), Feb. 2009.
19. "Promoting Neural Adaptation using Adaptive Technology", Department of Electrical Engineering, Northern Arizona University, (Flagstaff, AZ), Oct. 2008.
20. "Advances in neuromotor therapy after spinal cord injury", J. Abbas, 8th Educational Conference of the Arizona Spinal Cord Injury Association (Phoenix, AZ), Oct. 2007.
21. "Delivering Neurotechnology", presented at 'Commercializing Arizona Forum' (Phoenix, AZ), Oct. 2007.
22. "Improving neuromotor function after incomplete spinal cord injury", Neurorehabilitation Unit, Barrow Neurological Institute, (Phoenix, AZ), Sept. 2007.
23. "Parkinson's Disease: Treatment Using Deep Brain Stimulation" Arizona Grand Democrats, (Sun City, AZ), Mar. 2007.
24. "Spinal Cord Injury Research", presented at the Annual Meeting of the Arizona Spinal Injury Association, (Phoenix, AZ), Oct. 2005.
25. "Neuroprostheses and neuromotor therapy after spinal cord injury", Neurorehabilitation Unit, Barrow Neurological Institute, (Phoenix, AZ), Feb. 2005.
26. "Neuromuscular electrical stimulation for exercise and neuromotor therapy after spinal cord injury", The NeuroInstitute, (Tempe, AZ), Feb. 2005.
27. "New Strategies for Using Electrical Stimulation in Neurorehabilitation", Barrow Neurological Institute, (Phoenix, AZ), Jan. 2004.
28. "Standing after spinal cord injury: strategies for improving functional performance", Biomedical Engineering Program, University of Arizona, (Tucson, AZ) April 2003.
29. "Standing after spinal cord injury: strategies for improving functional performance", Scottsdale Community College, (Tempe, AZ), Feb. 2003.
30. "Engineering a new era in medical rehabilitation", Biomedical Engineering Department Seminar, Arizona State University, (Tempe, AZ), Sept. 2002.
31. "Advances in Neurorehabilitation: Functional Electrical Stimulation for Standing, Exercise and Therapy after Spinal Cord Injury" presented at the annual research symposium at the Rehabilitation Hospital of Indiana (Indianapolis, IN), June 2002.
32. "Neural Stimulation for Motor Control" presented to the Lexington Chapter of the IEEE (Lexington, KY), May 2001.
33. "Bioengineering the Nervous System: approaches to investigate, replace and repair the injured spinal cord" presented to the KY-IN Chapter of the Paralyzed Veterans of America (Louisville, KY), Sept. 2000.
34. "Fitting the Neural Prosthesis to the User", Department of Electrical Engineering, University of Twente, (Enschede, The Netherlands), July 2000.
35. "Fitting the Neural Prosthesis to the User", Center for Biomedical Engineering, University of Kentucky (Lexington, KY), April 1999.
36. "Customizing the FNS Control System for the User", Neural Prosthesis Seminar, FES Center, Case Western Reserve University, (Cleveland, OH), March 1999.

37. "Using Mathematics in the Rehabilitation of People with Spinal Cord Injury", presented to 1996 NSF Mathematics Research Experience for Undergraduates (REU) Program at The University of Kentucky, (Lexington, KY), July 1996.
38. "Laboratory Methods for Implementing and Evaluating Neural Control Systems", presented to 1996 NSF Mathematics Research Experience for Undergraduates (REU) Program at The University of Kentucky, (Lexington, KY), July 1996.
39. "Closed-Loop Control of FNS Walking", presented at FES Center, (Cleveland, OH), March 1995.
40. "Modulated Reflexes and Multi-joint Control of FNS Systems", presented at the Rehabilitation Engineering Center, MetroGeneral Health Center, (Cleveland, OH), Mar. 1995.
41. "Neural Network Control of Functional Neuromuscular Stimulation Systems", presented at Center for Biomedical Engineering, University of Kentucky, (Lexington, KY), Jan. 1995.
42. "Using Neural Models in the Design of a Biomedical Engineering Control System", presented at The Mathematical Research Branch, NIH, (Bethesda, MD), Aug. 1994.
43. "Neural Network Control of Cyclic Movements Using Functional Neuromuscular Stimulation", presented at Dept. of Physiology, Howard Univ. Medical School, (Washington, DC), Feb. 1994.
44. "Control of Functional Neuromuscular Stimulation Systems", presented at Shriver Laboratory, University of Maryland at College Park, (College Park, MD), Oct. 1993.
45. "Neural Network Control of Cyclic Movements Using Functional Neuromuscular Stimulation", presented at Dept. of Mechanical Engineering, The Catholic University of America, (Washington, DC), March 1993.
46. "Neural Network Control of Cyclic Movements Using Functional Neuromuscular Stimulation", presented at Dept. of Bioengineering, Univ. of Pennsylvania, (Philadelphia, PA), Oct. 1992.
47. "Neural Network Control of Functional Neuromuscular Stimulation Systems", presented at Dept. of Biomedical Engineering, Case Western Reserve Univ., (Cleveland, OH), May 1992.
48. "Neural Network Control of Cyclic Movements Using Functional Neuromuscular Stimulation", presented at Dept. of Bio, Chemical and Materials Engineering, Arizona State University, (Tempe, AZ), April 1992.
49. "Feedback Control of Coronal Plane Hip and Trunk Angles Using Functional Neuromuscular Stimulation", presented at Dept. of Biomedical Engineering, Case Western Reserve University, (Cleveland, OH), Sept. 1989.

**INVITED PRESENTATIONS** (delivered at Arizona State University)

1. "Cultural Experiences in the Africa Region", Global Advocacy Certificate Program, (Tempe, AZ), April 2020.
2. "Research Collaborations", Strengthening Institutional Linkages Program, (Tempe, AZ), Jan. 2019. (organized and presented at this workshop).



3. "Advanced prostheses: Are research directions aligned with amputee preferences?", Lincoln Center for Applied Ethics, (Tempe, AZ), Sept. 2017.
4. "Adventures in Humanitarian Engineering", (with M. Henderson and V. Pizziconi), Mandela Washington Fellows Program, Arizona State University (Tempe, AZ), July 2016.
5. "Adaptive Biomimetic Technology to Promote Neural Adaptation", Joint Basic Medical Sciences and Biomedical Informatics Departmental Seminar Series, Arizona State University, (Tempe, AZ), Oct. 2008.
6. "Traumatic Spinal Cord Injury: Adaptation and Recovery" President's Community Enrichment Program, Arizona State University, (Tempe, AZ), March 2007.
7. "Adaptive Neural Systems", Arizona State University Foundation, (Tempe, AZ), Oct. 2006.
8. "Designing Adaptive Systems to Promote Adaptation in Neural Systems", The Biodesign Institute at Arizona State University, (Tempe, AZ), June 2006.
9. "Technology to Promote Adaptation in Neural Systems", Discovery Tour, The Ira A. Fulton School of Engineering, Arizona State University, (Tempe, AZ), April 2006.
10. "Neuroengineering and Neurorehabilitation", The Biodesign Institute, Arizona State University, (Tempe, AZ), Feb. 2006.
11. "Unlocking the Mysteries of the Brain" ASU Adventures in Learning Program, Arizona State University, (Tempe, AZ), (presented with Thomas Hamm from Barrow Neurological Institute), Nov. 2005.
12. "Improving Deep Brain Stimulation System Parameter Selection", Wintech, Department of Electrical Engineering, Arizona State University, (Tempe, AZ), Nov. 2005.
13. "Deep Brain Stimulation after Parkinson's Disease: Developing Strategies for Improved Clinical Outcomes", presented with N. Krishnamurthi and A. Sitek at the Biodesign Institute, Arizona State University, (Tempe, AZ), Sept. 2005.
14. "Posture Control in Parkinson's Disease", Department of Kinesiology, Arizona State University, (Tempe, AZ), Dec. 2003.
15. "Adaptive Control of Systems for Neurorehabilitation", Department of Mathematics and Statistics, Arizona State University, (Tempe, AZ), Nov. 2003.
16. "Standing after spinal cord injury: strategies for improving functional performance", NSF IGERT Program on Neural & Musculoskeletal Adaptation in Form & Function, Arizona State University, (Tempe, AZ), Feb. 2003.

**RESEARCH SUPPORT****GRANTS AND FELLOWSHIPS RECEIVED***Restoring sensation with a neural-enabled prosthetic hand system for daily use: a multi-site clinical trial*

Department of the Army, Joint Warfighter Medical Research Program

JW180061                      09/30/19- 09/29/23;                      \$5,997,670

PI:                                      Ranu Jung, PhD (Florida International University)

**PIs on subcontracts: James J. Abbas, PhD** (Center for Adaptive Neural Systems/BME, ASU)

ASU subcontract budget:                      \$444,568

Paul Pasquina, MD (Walter Reed National Military Medical Center)

James Patrick (Cochlear Ltd.)

*Enhancing Sensorimotor Integration Using a Neural Enabled Prosthetic Hand System*

National Institutes of Health, National Institute of Biomedical Imaging and Bioengineering

R01 EB023261                      03/01/19- 12/31/22;                      \$2,556,344

PI:                                      Ranu Jung, PhD (Florida International University)

**PI on subcontract: James J. Abbas, PhD** (Center for Adaptive Neural Systems/BME, ASU)

ASU subcontract budget: \$198,476

*CRCNS: Improving Bioelectronic Selectivity with Intrafascicular Stimulation*

National Institutes of Health, National Institute of Biomedical Imaging and Bioengineering

R01 EB027584                      09/01/18- 05/31/22;                      \$763,755 (ASU portion: \$249,274)

**PIs (Multiple PI/PD):** Ranu Jung, PhD (Florida International University)**James J. Abbas, PhD** (Center for Adaptive Neural Systems/BME, ASU)

Yannick Bornat, PhD (Université de Bordeaux)

Co-Investigators: Florian Kölbl, PhD (Université de Cergy-Pontoise)

Sylvie Renaud, PhD (Université de Bordeaux)

Olivier Romain, PhD (Université de Cergy-Pontoise)

Laura McPherson, PhD (Florida International University)

*Wearable Real-Time Feedback System to Improve Gait and Posture in Parkinson's Disease*

R21NR017484                      07/01/18- 06/30/20                      \$449,401

PI:                                      Narayanan Krishnamurthi, PhD (College of Nursing and Health Innovation, Center for Adaptive Neural Systems)

**Co-Investigators: James J. Abbas, PhD** (Center for Adaptive Neural Systems/BME, ASU)

Pavan Turaga, PhD (Arts, Media &amp; Engineering/Electrical Eng., ASU)

Todd Ingalls, MM (Arts, Media &amp; Engineering/Electrical Eng., ASU)

Michael Belyea, PhD (College of Nursing and Health Innovation, ASU)

*Real-Time Feedback Training to Improve Gait and Posture in People with Parkinson's Disease*

ASU-Mayo Seed Grant Program 01/01/18- 12/31/18 \$50,000

PIs: Narayanan Krishnamurthi, PhD (College of Nursing and Health Innovation, Center for Adaptive Neural Systems)  
Erika Driver-Dunckley, MD (Mayo Clinic Arizona)

**Co-Investigators:** **James J. Abbas, PhD** (Center for Adaptive Neural Systems/BME, ASU)  
Charlene Hoffman-Snyder, CNP, DNP, RN (Mayo Clinic Arizona)

*Restoring sensation with a neural-enabled prosthetic hand system for home use: a first-in-human study*

Defense Advanced Research Projects Agency (DARPA) BTO-HAPTIX  
W911NF-17-1-0022 02/01/17- 12/31/20; \$2,212,510

PI: Ranu Jung, PhD (BME, Florida International University)  
co-Investigators: Kenneth Horch (BME, Florida International University)  
Wensong Wu (Math and Statistics, Florida International University)

**PI on subcontract:** **James J. Abbas, PhD** (Ctr. for Adaptive Neural Systems/SBHSE, ASU)  
subcontract budget: \$242,404

*Sensorimotor control of grasping and manipulation through a soft-synergy prosthetic hand and peripheral neural interface system*

Defense Advanced Research Projects Agency (DARPA) BTO-HAPTIX  
W911NF-17-1-0049 02/01/17- 07/31/18; \$820,086

PI: Marco Santello, PhD (SBHSE, ASU)  
**Co-Investigators:** **James J. Abbas, PhD** (Ctr. for Adaptive Neural Systems/SBHSE, ASU)  
Qiushi Fu, PhD (SBHSE, ASU)

PI on subcontract: Ranu Jung, PhD (Florida International University)

*Developing a powered Ankle Foot Orthosis to enhance gait performance and decrease falls following stroke.*

Virginia Piper Trust 11/01/16 - 05/31/17 \$50,000

PI: Claire Honeycutt, PhD (SBHSE, ASU)  
**Co-investigators:** **James J. Abbas, PhD** (Ctr. for Adaptive Neural Systems/SBHSE, ASU)  
Thomas Sugar, PhD (The Polytechnic School, ASU)  
James Lynskey, PhD (Arizona School of Health Sciences)

*CRCNS: Computation-Enabled Adaptive Ventilatory Control System*

NSF/NIH/ANR Joint program  
NIH:R01NS086088 09/01/13- 08/30/17; \$569,613

PIs: Ranu Jung, PhD (Florida International University)  
Sylvie Renaud, PhD (Universite de Bordeaux, additional €255,832)  
**Consultant:** **James J. Abbas, PhD** (Ctr. for Adaptive Neural Systems/SBHSE, ASU)

*Abbott-Effect of Vitamin D3 Supplementation on Dynamic Stability*

Abbott Laboratories 07/01/15 - 06/30/17; \$122,250  
 PI: Thurmon Lockhart, PhD (SBHSE, ASU)  
**Co-Investigators:** Corrie Whisner, PhD (Nutrition, College of Health Solutions, ASU)  
 Claire Honeycutt, PhD (SBHSE, ASU)  
 Michael Caplan, PhD (SBHSE, ASU)  
**James J. Abbas, PhD** (Ctr. for Adaptive Neural Systems/SBHSE, ASU)  
 Narayanan Krishnamurthi, PhD (College of Nursing and Health Innovation, Center for Adaptive Neural Systems)

*DSM-Effect of Vitamin D3 Supplementation on Dynamic Stability*

DSM 07/01/15 - 06/30/17; \$108,249  
**Co-Investigators:** Corrie Whisner, PhD (Nutrition, College of Health Solutions, ASU)  
 Claire Honeycutt, PhD (SBHSE, ASU)  
 Michael Caplan, PhD (SBHSE, ASU)  
**James J. Abbas, PhD** (Ctr. for Adaptive Neural Systems/SBHSE, ASU)  
 Narayanan Krishnamurthi, PhD (College of Nursing and Health Innovation, Center for Adaptive Neural Systems)

*Rehabilitative Technologies that Monitor Metabolic Demands of Prosthetics in Lower Extremity Amputees during Rehabilitation*

Department of Defense  
 W81XWH-12-C-0055 01/1/13- 12/31/15; \$129,203  
 Primary contract to Barron Associates (PI: Eileen Krepkovich)  
 PI on subcontract: Glenn Gaesser, PhD (School of Nutrition and Health Promotion)  
**Co-Investigator:** **James J. Abbas, PhD** (Ctr. for Adaptive Neural Systems/SBHSE, ASU)  
 Consultant: Michael Pack, CPO (Artificial Limb Specialists)

*Neural-enabled Prostheses with Sensorimotor Integration*

NIH-National Institute of Biomedical Imaging and Bioengineering  
 R01-EB008578 09/30/07- 06/30/16; \$3,281,759  
 PI: Ranu Jung, PhD (Florida International University)  
 co-Investigators: Kenneth Horch (Biomedical Engineering)  
 Jorge Orbay, MD (Surgery)  
 Jeffrey Fan, PhD (Electrical Engineering)  
 Dennis McCarthy, PhD, OTR/L (Occupational Therapy)  
**PIs on subcontracts:** **James J. Abbas, PhD** (Center for Adaptive Neural Systems/BME, ASU)  
 James Patrick, Cochlear Ltd., Australia  
 Harold Sears, PhD, Motion Control, Inc., Utah, USA

*Effective and Reliable Peripheral Interfaces for Prosthetic Control*

Defense Advanced Research Projects Agency (DARPA)  
 N660001-12-C-4195 01/24/12- 01/23/15; \$705,424  
 PI: Ranu Jung, PhD (Florida International University)  
**Consultants:** **James J. Abbas, PhD** (Center for Adaptive Neural Systems/BME, ASU)  
 Michael Pack, CPO (Artificial Limb Specialists)

*Stimulation-Augmented Exercise and Neuromotor Therapy*

Subcontract on Phase II SBIR to customKYnetics, Inc. from NIH-NICHD

NIH R44-HD050006 04/01/2008-03/31/2013; subcontract budget: \$88,698

PI on SBIR grant: Eric Hartman, MS (customKYnetics, Inc.)

**PIs on subcontracts:** **James J. Abbas, PhD** (Center for Adaptive Neural Systems/BME, ASU)  
Denise Campagnolo, MD (Barrow Neurological Institute)  
Edee Field-Fote, PhD, PT (Miami Project to Cure Paralysis)

*Exercise Training in Parkinson's Disease: Neural and Functional Benefits*

NIH R21-HD060315 09/23/2008 - 02/28/2013 \$495,525

PI: Narayanan Krishnamurthi, PhD (Center for Adaptive Neural Systems)

**co-Investigators:** **James J. Abbas, PhD** (Center for Adaptive Neural Systems/BME, ASU)  
Wayne Willis, PhD (Kinesiology, ASU)  
Holly Shill, MD (Sun Health Research Institute)  
Kewei Chen, PhD (Banner Good Samaritan Medical Center)  
Padma Mahant, MD (Banner Good Samaritan Medical Center)  
Johan Samanta, MD (Banner Good Samaritan Medical Center)  
Abraham Lieberman, MD (Barrow Neurological Institute)

*Improving Orthostatic Tolerance After Spinal Cord Injury*

Paralyzed Veterans of America

Award: 2546 02/01/2008 - 01/31/2011 \$150,000

PI: Narayanan Krishnamurthi, PhD (Center for Adaptive Neural Systems)

**co-Investigators:** **James J. Abbas, PhD** (Center for Adaptive Neural Systems/Bioeng.)  
Denise Campagnolo (Center for Adaptive Neural Systems;  
Barrow Neurological Institute)

*Adaptive Electrical Stimulation for Locomotor Retraining*

NIH-NICHD-National Center for Medical Rehabilitation Research

R01-HD049773 08/01/2005-04/30/2011; \$868,573

**PI:** **James J. Abbas, PhD** (Center for Adaptive Neural Systems/Bioeng.)

co-Investigator: Ranu Jung, PhD

*Adaptive Stimulator for Exercise and Rehabilitation*

Subcontract on Phase II SBIR to customKYnetics, Inc. from NIH-NICHD-NCMRR

R44-HD41820 07/01/04-06/30/09; subcontract budget: \$234,885

PI on SBIR grant: Eric Hartman, MS (customKYnetics, Inc.)

**PI on subcontract:** **James J. Abbas, PhD**

*CRCNS-Modeling Neuromusculoskeletal Alterations After Spinal Cord Injury*

NIH-NSF Joint Program; National Institute of Neurological Disorders & Stroke  
 R01-NS10021029 7/1/05-7/31/10, \$1,314,799  
 PI: R. Jung, PhD (Center for Adaptive Neural Systems/Bioeng.)  
**co-Investigators:** **James J. Abbas, PhD** (Center for Adaptive Neural Systems/Bioeng.)  
 A. Razdan, PhD (PRISM/Computer Science)  
 Sub-contract: T. Hamm, PhD (Barrow Neurological Institute)  
 Sub-contract: G. Yamaguchi, PhD (E<sup>x</sup>ponent, Inc.)  
 Sub-contract: V. Booth, PhD (U. Michigan, Mathematics).

*Neuromorphic Control System for Powered Limb Splints*

Subcontract on Phase II STTR to AdveNSys, LLC from US Army  
 W911NF-05-C-0122 09/28/05-03/31/08 subcontract budget: \$225,805  
 PI on STTR: R. Jung, PhD  
 Co-I on STTR: V. Jung, MBA (AdveNSys, LLC)  
**PI on subcontract:** **James J. Abbas, PhD** (Center for Adaptive Neural Systems/Bioeng.)

*Catalyst- Center of Excellence for Adaptive Neuro-Biomechatronic Systems (CEANS)*

National Science Foundation  
 SBE-0518697 07/01/05-06/30/08; \$133,118  
 PI: Ranu Jung, PhD (Center for Adaptive Neural Systems/Bioeng.)  
**co-Investigators:** **James J. Abbas, PhD** (Center for Adaptive Neural Systems/Bioeng.)  
 Carlos Castillo-Chavez (Mathematics)  
 Sharon Crook (Mathematics)  
 Antonio Garcia (Bioengineering)  
 Lokesh Joshi (Biodesign/Bioengineering)  
 Yang Kuang (Mathematics)  
 Stephen Phillips (Electrical Engineering)  
 Anshuman Razdan (PRISM)  
 Marco Santello (Kinesiology/Bioengineering)  
 Joseph Wang (Biodesign/Chem. & Materials Engineering/ Chemistry)

*Force Modulation Training in Children with Cerebral Palsy*

NIH- National Institute of Neurological Disorders & Stroke  
 F31-NS053010 09/01/05-08/31/08; \$90,000  
 PI (student): Andrea Downing (Center for Adaptive Neural Systems/Bioeng.)  
 (Ruth Kirschstein Individual NRSA pre-doctoral fellowship)  
**PI (mentor):** **James J. Abbas, PhD** (Center for Adaptive Neural Systems/Bioeng.)

*Stimulation-Augmented Exercise and Neuromotor Therapy*

Subcontract on Phase I SBIR to customKYnetics, Inc. from NIH-NICHD  
 NIH R43-HD050006 4/1/06-10/31/07; subcontract budget: \$32,630  
 PI on SBIR grant: Eric Hartman, MS (customKYnetics, Inc.)  
**PI on subcontract:** **James J. Abbas, PhD** (Center for Adaptive Neural Systems/Bioeng.)

*Neuromorphic Control System for Powered Limb Splints*

Subcontract on Phase I STTR to AdveNSys, LLC from US Army  
 W911NF-04-L-0071; 08/01/04-01/31/05; subcontract budget: \$31,515  
 PI on STTR: Ranu Jung, PhD  
 Co-Investigator: Vikram Jung, MBA (AdveNSys, LLC)  
**PI on subcontract: James J. Abbas, PhD** (Center for Adaptive Neural Systems/Bioeng.)

*A Rodent Model for Locomotor Training with FNS* (transferred to ASU)

NIH-NICHD-National Center for Medical Rehabilitation  
 R01-HD40335 01/01/02–12/31/04; \$781,920  
 PI: Ranu Jung, PhD (Center for Biomedical Engineering, U. of Kentucky)  
**co-Investigators: James J. Abbas, PhD** (Center for Biomedical Engineering)  
 Steve Scheff, PhD (Anatomy & Neurobiology)

*Customized Electrical Stimulation for SCI Rehabilitation*

Subcontract on Phase II SBIR grant to customKYnetics, Inc. from NIH-NICHD-NCMRR  
 R44-HD39013 09/01/02–08/31/04 subcontract budget: \$65,000  
 PI on SBIR grant: Eric Hartman, MS (customKYnetics, Inc.)  
**PI on subcontract: James J. Abbas, PhD**  
 co-Investigators: Susan McDowell, MD (Physical Medicine & Rehabilitation)

*Preparatory Adjustments for Improved Standing with FNS* (transferred to ASU)

NIH-NICHD-National Center for Medical Rehabilitation  
 R01-HD38570 05/01/00–04/31/04 \$588,488  
**PI: James J. Abbas, PhD**  
 co-Investigators: Jean McCrory, PhD (Kinesiology & Health Promotion)  
 David Gater, MD, PhD (Physical Medicine & Rehabilitation)  
 Susan McDowell, MD (Physical Medicine & Rehabilitation)  
 Ronald J. Triolo, PhD (Case Western Reserve University)  
 Robert F. Kirsch, PhD (Case Western Reserve University)

*Electrical Stimulation for Trunk Stabilization in SCI*

Subcontract on Phase I SBIR grant to customKYnetics, Inc. from NIH-NICHD-NCMRR  
 R43-HD041286 04/01/02-09/30/02 \$27,000  
 PI on SBIR grant: Eric Hartman, MS (customKYnetics, Inc.)  
**PI on subcontract: James J. Abbas, PhD**  
 co-Investigators: Susan McDowell, MD (Physical Medicine & Rehabilitation)

*Adaptive Stimulator for Exercise and Rehabilitation*

Subcontract on Phase I SBIR grant to customKYnetics, Inc. from NIH-NICHD-NCMRR  
 02/01/02–07/31/02 \$17,000  
**PI on subcontract: James J. Abbas, PhD**  
 co-Investigators: Susan McDowell, MD (Physical Medicine & Rehabilitation)  
 PI on SBIR grant: Eric Hartman, MS (customKYnetics, Inc.)

*Recovery of Cardiovascular Control after Spinal Cord Injury*

Kentucky Spinal Cord & Head Injury Research Trust, 01/01/01–12/31/04, \$279,931

**PI:** **James J. Abbas, PhD**

co-Investigators: Joyce Evans, MS (Center for Biomedical Engineering)  
 Charles F. Knapp, PhD (Center for Biomedical Engineering)  
 Robert Taylor, MD, PhD (Cardinal Hill Rehabilitation Hospital)  
 Susan McDowell, MD (Physical Medicine & Rehabilitation)  
 David Gater, MD (Physical Medicine & Rehabilitation)  
 David Randall, PhD (Department of Physiology)  
 David Brown, PhD (Center for Biomedical Engineering)

*Automatic Control of Standing Balance with FNS*

Subcontract on grant from NIH-National Institute for Neurological Disorders and Stroke

R01-NS-40547-01 07/01/00-06/30/03 subcontract budget: \$124,670

PI on primary: Ronald J. Triolo (Case Western Reserve University)

**PI on subcontract:** **James J. Abbas, PhD**

*Implanted Neuroprostheses for Standing after SCI*

Subcontract on grant from FDA Grant, 10/1/99-09/31/02 subcontract budget: \$92,131

PI on primary: Ronald J. Triolo (Case Western Reserve University)

**PI on subcontract:** **James J. Abbas, PhD**

co-Investigators: David Gater, MD, PhD (Physical Medicine & Rehabilitation)  
 Susan McDowell, MD (Physical Medicine & Rehabilitation)

*Individualizing the Design and Use of a FES-based Standing Neuroprosthesis*

Subcontract on Department of Veterans Affairs Merit Review Grant

B2105RC, 10/1/99-09/31/02 subcontract budget: \$22,000

PI on primary: Robert F. Kirsch, PhD (Case Western Reserve University)

**PI on subcontract:** **James J. Abbas, PhD**

*Effects of Phasic Neuromuscular Electrical Stimulation on Functional Recovery in Incomplete Spinal Cord Injury*

Kentucky Spinal Cord and Head Injury Trust, 01/01/99-12/31/00 \$124,056

**PI:** **James J. Abbas, PhD**

co-Investigator: Susan McDowell, MD (Physical Medicine & Rehabilitation)

*Customized Electrical Stimulation for SCI Rehabilitation*

Subcontract on Phase I SBIR grant from National Center for Medical Rehabilitation

R43-HD39013, 09/01/00–08/31/01 subcontract budget: \$30,000

**PI on subcontract:** **James J. Abbas, PhD**

co-Investigators: David Gater, MD, PhD (Physical Medicine & Rehabilitation)

primary contract to customKYNetics, Inc:

*Customized Electrical Stimulation for SCI Rehabilitation,* PI: Eric Hartman



*Control of Limb Position Using Functional Neuromuscular Stimulation*

Whitaker Foundation, 01/01/97-06/30/00 \$208,946

**PI:** James J. Abbas, PhDco-Investigators: Susan McDowell, MD (Physical Medicine & Rehabilitation)  
Bruce Walcott, PhD (Department of Electrical Engineering)*Electrical stimulation for enhanced functional recovery in spinal cord injury*Paralyzed Veterans of America, Kentucky and Indiana Chapter,  
06/01/99 \$10,000**PI:** James J. Abbas, PhD*Trunk Muscle Stimulation for Seated Posture Control in Spinal Cord Injury*

Univ. of Kentucky Medical Center Research Fund, 07/01/98-06/30/99 \$14,945

**PI:** James J. Abbas, PhDco-Investigators: David Gater, MD, PhD (Physical Medicine & Rehabilitation)  
Charles F. Knapp, PhD (Center for Biomedical Engineering)*Biomedical Engineering Approaches to Spinal Cord Injury Research (PI)*

The Whitaker Foundation, Conference Grant, 05/00-07/00; \$10,000

**PI:** James J. Abbas, PhDco-Investigators: Ranu Jung, PhD (Center for Biomedical Engineering)  
James Geddes, PhD (Anatomy & Neurobiology)*Analog VLSI-Spinal Cord Interface for Motor Control*NIH-National Center for Research Resources  
R21-RR12588 09/01/97-08/31/00; \$184,901.**PI:** Ranu Jung, PhD (Center for Biomedical Engineering)**co-Investigators:** James J. Abbas, PhD  
Elizabeth Brauer, PhD (Northern Arizona University)*Standing by Functional Neuromuscular Stimulation*Subcontract on NIH Neural Prosthesis Contract,  
N01-NS-6-2351 11/01/96-09/31/99, subcontract budget: \$140,636**PI on primary:** Ronald J. Triolo, PhD (Case Western Reserve University)co-Investigators: Robert F. Kirsch, PhD (Case Western Reserve University)  
John A. Davis, MD (Case Western Reserve University)  
James J. Abbas, PhD  
Scott Delp, PhD (Northwestern University)**PI on subcontract:** James J. Abbas, PhD

co-Investigator: Susan McDowell, MD (Physical Medicine &amp; Rehabilitation)

*Metabolic Analysis in Exercise Physiology and Rehabilitation*

Major Research Equipment Grant, U. of Kentucky, 1997, \$27,429

**PI:** J.W. Yates, PhD (Kinesiology & Health Promotion)**co-Investigators:** James J. Abbas, PhD  
David Gater, MD, PhD (Physical Medicine & Rehabilitation)

*Design and Assessment of Assistive Technology*

Subcontract to on US Army Grant, 11/01/94-10/31/98 \$280,000

PI on subcontract: Jack Winters, PhD

**co-PI: James J. Abbas, PhD**

primary grant to the National Rehabilitation Hospital: *Assistive Technology Research Center*

US Army MPMC, 10/1/94 – 10/1/98 \$4,000,000

PI: William Peterson (National Rehabilitation Hospital)

(this proposal was funded, but I could not participate due to my departure from Washington, DC)

*Adaptive Feedforward Neural Network Control System Design*

Subcontract to Catholic University on NSF Grant, 09/01/92–08/31/95; \$80,396

**PI on subcontract: James J. Abbas, PhD**

primary contract to Case Western Reserve University: *Neural Network Control of Oscillatory Movements of Multi-segmented Musculoskeletal Systems.*

NSF-BCS-9216697, 09/01/92–08/31/95; \$285,387

PI: Howard J. Chizeck, ScD

**co-PI: James J. Abbas, PhD**

*The Application of Artificial Neural Networks to Control FNS-Generated Walking in Children with Spinal Cord Injuries.*

Research Fellowship from Shriners Hospitals, 09/01/92–06/30/93, \$45,000

**Post-doctoral research fellow: James J. Abbas, PhD**

Research mentor: Ronald J. Triolo, PhD

**STUDENT MENTORSHIP, RESEARCH SUPERVISION AND SERVICE ON DISSERTATION COMMITTEES**

*Awards to mentored students:*

Niveditha Muthukrishan, IEEE Phoenix Section Student Scholarship Award, 2020.  
(Doctoral mentors: J. Abbas and N. Krishnamurthi)

Niveditha Muthukrishan, ‘Grad Slam’ Winner, Science and Technology Category;  
Elevator Pitch Competition, Graduate and Professional Student Association,  
2020. (Doctoral mentors: J. Abbas and N. Krishnamurthi)

Niveditha Muthukrishan, SBHSE Graduate Excellence Award, 2020. (Doctoral  
mentors: J. Abbas and N. Krishnamurthi)

Sabina Minta-Jacobs, Master’s Opportunity for Research in Engineering (MORE)  
Fellowship Award, 2020. (ASU Faculty mentor: J. Abbas)

Emmanuella Adjei-Sowah, Dzifa Kwaku, and Ermyntude Adjei (undergraduate  
students from Kwame Nkrumah University of Science and Technology  
(KNUST) enrolled at ASU): *MasterCard Foundation Scholars Research Fund  
Award*, 2019. (ASU Faculty mentor: J. Abbas)

María José Quezada, Arianna Moreno, Brandon Bartels, and Haley Sivertson,  
*BioAccel Solutions Challenge Award*, 2017. (Undergraduate Capstone Design  
Team Mentors: J. Abbas and N. Krishnamurthi)

William Langenbach, Kirsten Jefferys, and Taylor Deegan, *Gore Funding Award*,  
2015. (Undergraduate Capstone Design Team Mentor: J. Abbas)

Charla Howard, American Academy of Orthotists and Prosthetists, *Thranhardt  
Lecture Finalist*, 2013. (Doctoral mentor: J. Abbas)

Alison Conovaloff, *Flinn Foundation Bioengineering Fellowship*, 2003; *Faculty  
Emeriti Fellowship*, 2005. (Doctoral mentor: J. Abbas)

Andrea Downing, *Force Modulation Training in Children with Cerebral Palsy*, Ruth  
Kirschstein Individual NRSA Pre-Doctoral Fellowship, National Institute of  
Neurological Disorders & Stroke, 2005. (Doctoral mentor: J. Abbas)

*Primary advisor for:*

**DOCTORAL STUDENTS**

School of Biological and Health Systems Engineering (formerly Harrington  
Department of Bioengineering), ASU:

Niveditha Muthukrishnan, PhD, expected 2022  
(co-advised with Narayanan Krishnamurthi, PhD)

Anna Newcomb, PhD, expected 2021  
(co-advised with Neil Crawford, PhD)

Charla Lindley Howard, PhD, 2017  
Thesis Title: *Techniques to Assess Balance and Mobility in Lower-Limb  
Prosthesis Users*

Catherine Vuong Smith, PhD, 2015

(co-advised with Todd Ingalls)

Thesis Title: *Feedback Paradigm for Rehabilitation of People with Parkinson's Disease*

Alison Conovaloff, PhD, 2013

Thesis title: *The Effects of Deep Brain Stimulation Amplitude on Motor Performance in Parkinson's Disease*

Andrea Downing, PhD, 2008

Thesis title: *Force Production and Control in Children with Cerebral Palsy*

Mathematics, School of Mathematical and Statistical Sciences, ASU:

Morteza Rouhani, PhD, expected 2021; supported by NIH-R01 to Abbas; co-advisors: James Abbas, PhD (SBHSE) and Sharon Crook, PhD (Math)

**MASTER'S THESIS STUDENTS**

School of Biological and Health Systems Engineering (formerly Harrington Department of Bioengineering), ASU:

Deepika Baskaran, MS, 2017

(co-advised with Narayanan Krishnamurthi, PhD)

Thesis Title: *Real-Time Feedback Training to Improve Gait and Posture in Parkinson's Disease*

Saaransh Jain, MS, 2015

(co-advised with Jeffrey LaBelle, PhD)

Thesis Title: *Development and Validation of a Novel Biomechanical Testing Setup and Procedure for Olecranon Fracture Fixation Assessment*

Jeremy Jellish, MS, 2014

(co-advised with Narayanan Krishnamurthi, PhD)

Thesis Title: *Real-Time Feedback to Improve Posture and Gait in Parkinson's Disease*

Shruthi Balasubramanian, MS, 2014

(co-advised with Narayanan Krishnamurthi, PhD)

Thesis Title: *Age-Related Changes in Balance and Gait*

Alex Pacanowsky, MS, 2008

Thesis title: *Exercise Response to Voluntary Arm Crank Ergometry and Electrically Stimulated Leg Cycling in a Subject with Complete Tetraplegia*

Kimberly Yarnall, MS 2007 (co-advised with Kristi Csavina, PhD)

Thesis title: *Functional changes in gait during level walking and stair climbing after intertrochanteric hip fractures*

John McCamley, MS, 2007 (co-advised with Kristi Csavina, PhD)

Thesis title: *Kinematics and Kinetics of Stair Climbing in Elderly Subjects: The Effects of Minimally Invasive Total Knee Arthroplasty*

Elliot Downing, MS, 2006 (co-advised with Neil Crawford, PhD)

Thesis title: *Subject-Specific Finite Element Modeling of the Lower Cervical Spine*

Anjali Gupta, MS, 2006 (co-advised with Kristi Csavina, PhD)

Thesis title: *The Effect of Screw Diameter on the Fixation of a Lateral Plateau Split Fracture*

Almir Halilcevic, MS, 2006

Project title: *Evaluation of PDA Platform for Development of Closed-Loop Functional Neuromuscular Stimulation Systems*

Shelly Allison, MS, 2006

Thesis title: *Adaptive Control of Locomotion During Partial Weight Bearing Therapy*

Andrew Hayes, MS, 2005

Thesis title: *Effect of Wheelchair Seatback on Propulsion in Experienced Manual Wheelchair Users*

Brian Glaister, MS, 2005

Thesis title: *Analysis of Prosthetic Feet in Above Knee Amputees*

Stefani Mulligan, MS, 2005

Thesis title: *Effect of Deep Brain Stimulation on Postural Control in Parkinson's Disease*

Center for Biomedical Engineering, University of Kentucky:

Joseph Finley, MS, 2002

Thesis title: *Feedback Signals to Adjust and Control Standing Posture*

Junli Ou, MS, 2001

Thesis title: *Adaptive Control of Multi-segment Movements Using Functional Electrical Stimulation.*

Xia Zhang, MS, 2000

Thesis title: *The Effects of Hip Muscle Properties and Co-stimulation on the Control of Standing Using Functional Neuromuscular Stimulation*

Eric Hartman, MS, 2000

Thesis title: *Evaluation of a Neural Network Controller for an Antagonist Muscle System: An Approach for Control of Coronal Plane Standing Using FNS*

Pankaj Kataria, MS, 1999

Thesis title: *User Controlled Functional Neuromuscular Stimulation System with an Adaptive Neural Network*

JoAnne A. Riess, MS, 1997

Thesis title: *Evaluation of Adaptive Neural Network and Feedback Controllers in Cyclic Movement using Functional Neuromuscular Stimulation*

**MS APPLIED RESEARCH PROJECT STUDENTS:**

Masters in Biomedical Engineering, Arizona State University

Sabina Minta-Jacobs, 2021 (co-mentored with N. Krishnamurthi)

Davis Matthews, 2020 (co-mentored with V. Pizziconi)

Stephen Lane, 2020

Shaileen Parikh, 2020 (co-mentored with N. Krishnamurthi)

Maxwell Sakyi, 2020 (co-mentored with N. Krishnamurthi)

Vinisha Venugopal, 2020 (co-mentored with N. Krishnamurthi)  
Eugene Ablordeppey, 2019 (co-mentored with N. Krishnamurthi)  
Alireza Momeni, 2019 (co-mentored with B. Kelly)  
Allison Marley, 2018 (co-mentored with B. Kelly)  
Sarah Patterson, 2018 (co-mentored with L. Hosman)  
Michael Spina, 2018  
Candice Chen, 2017  
Vanessa Barker, 2017 (co-mentored with B. Kelly)  
Kirsten Jefferys, 2017 (co-mentored with B. Kelly)  
Austin Jacobson, 2017 (co-mentored with S. Foldes)  
Zachary Winters, 2017 (co-mentored with S. Foldes)  
Diana Tran, 2016  
Payton Herrera, 2016 (co-mentored with N. Krishnamurthi)  
Cole Brown, 2016 (co-mentored with B. Kelly)  
Alyssa Oberman, 2016 (co-mentored with J. Peles)  
Raj Ahir, 2016 (co-mentored with N. Krishnamurthi)  
Derek Titus, 2016 (co-mentored with B. Smith, E. Frow)  
David Hilgers, 2013  
Jieying Pan, 2012  
Lusha Chen, 2012  
Christopher LeBeau, 2011

**POST-DOCTORAL SCHOLARS:**

Alfred Haas, PhD, 2009-2011 (w/ R. Jung)  
Jason C. Gillette, PhD, 1999-2002

**RESEARCH SCIENTISTS:**

Narayanan Krishnamurthi, PhD,  
Research Scientist, 2005-2007  
Research Assistant Professor, 2007-2013

**POST-BACCALAUREATE MINORITY RESEARCH MENTORSHIP, ARIZONA STATE UNIVERSITY:**

Teron Lindsey, 2016  
Danielle Sampson, 2010

**UNDERGRADUATE STUDENT MENTORSHIP:**

Barrett, The Honors College, Arizona State University:

Devika Dileep, Honors Thesis Mentor, 2020-21  
Thesis title: *Modeling the Effect of Mechanical Deformation on Electrical Stimulation of Peripheral Nerve Fibers*  
Alarmel Sira, Honors Thesis Mentor, 2018-19  
Thesis title: *Modelling the Response of Peripheral Nerve Axons to Applied Electric Fields*  
Randee Huffman, Honors Thesis Mentor, 2018-19  
Thesis title: *Multiple Degree-of-Freedom Elbow Joint*

Tamara Sleem, Honors Thesis Co-Mentor (w/ T. Hamm), 2017-18

Thesis title: *The Effects of Exercise on Locomotor Recovery After Partial Spinal Cord Injury in a Rat Model*

Gabriel Kaplan, Honors Thesis Mentor, 2017-18

Thesis title: *Development of a Wearable Haptic Feedback System for Use in Lower-Limb Prostheses: Proof of Concept and Verification*

Jeremy Jellish, Honors Thesis Mentor, 2010-11

Thesis title: *Effects of Rowing Exercise on Seated Posture Control in Persons with Spinal Cord Injury*

John Spanias, Honors Thesis Mentor, 2010-11

Thesis title: *Stroke Rehabilitation Using Functional Electrical Stimulation: Evaluating Algorithms for Adaptive Control*

Shravan Sridhar, Honors Thesis Mentor, 2010-11

Thesis title: *The Effects of Rowing Exercise Therapy on Shoulder Range of Motion and Steadiness in Individuals with Spinal Cord Injury*

Stuart Wentz, Honors Thesis Co-Mentor (w/ R. Jung), 2010-11

Thesis title: *Adaptive Diaphragmatic Pacing for Respiratory Rehabilitation Therapy*

Anjali Gupta, Honors Thesis Mentor, 2003-04

Thesis title: *Wheelchair Mobile Arm Support for a Muscular Dystrophy Patient*

Crystal Ong, Honors Thesis Mentor, 2002-03

Thesis title: *Computer/Internet Interface Device for a Person with Limited Motor Control*

Undergraduate Research, Arizona State University:

Myung (Matt) Chung, Fulton Undergraduate Research Initiative, 2020

Crispin Foli, Undergraduate Research, 2020

Devika Dileep, Fulton Undergraduate Research Initiative, 2019-2020

Maxwell Sakyi, Undergraduate Research, 2019

Ermyntrude Adjei, Undergraduate Research, 2019

Ruby Obeng, Undergraduate Research, 2017

Prince Ampofo, Undergraduate Research, 2017

Eugene Ablordeppey, Undergraduate Research, 2017

Thanh Nguyen, Fulton Undergraduate Research Initiative, 2015, 2016

Adam Pak, Fulton Undergraduate Research Initiative, 2015

Casey Weinstein, Fulton Undergraduate Research Initiative, 2014

Modesto Lopez, Minority Access to Research Careers Fellow, 2007-08

Luis Landgrave, Fulton Undergraduate Research Initiative, 2005

Undergraduate Research, University of Kentucky:

Lawrence Jackson (undergraduate Kinesiology student; mentored independent research project, 2001-2002)

Julia Parakkat (undergraduate Biosystems and Agricultural Engineering student; mentored independent research project, 2001)

Lucas Kennedy (undergraduate Biology student; mentored independent research project, 2000)  
 Anne Schwarting (undergraduate Biology student; mentored independent research project, 1999)  
 Udesh deSilva (undergraduate Biology student; independent research project, 1998)  
 Edward C. Stites (undergraduate Math student; 1996 NSF REU program, 1997 sponsored independent research project; University of Kentucky)  
 Jason Neiser (undergraduate Physics student; 1997 NSF REU program).  
 Sarah Dean (undergrad. Math/Biomed Eng. student; 1997 NSF-REU program).

Capstone Design Project Mentor, Biomedical Engineering:

|                              |                    |                     |
|------------------------------|--------------------|---------------------|
| 2019-2020:                   | Belinda Okomeng    | Gilgal Ansah        |
|                              | Theophilus Annan   | Patience Yeboah     |
|                              | Juliet Addo        | Yvonna Chan         |
|                              | Courtney Newman    | Sabina Minta-Jacobs |
| 2018-2019:                   | Maitha Alkatheeri  | Eman Abu Alrahi     |
|                              | Dzifa Kwaku        | Jaffalie Twaibu     |
|                              | Sheania Morgan     | Enock Darko         |
|                              | Diane Iradukunda   | Angelica Gutierrez  |
|                              | Kendra Starkel     | Alarmel Sira        |
|                              | Cami Rowan         | Stephen Lane        |
|                              | Tanner Levi        | Derek Vielhauer     |
| 2017-2018:                   | Esteban Cruz       | Dakota Graham       |
|                              | John Cunningham    | Shaheeda Adusei     |
|                              | Ruby Afriyie Obeng | Douglas Amoo-Sargon |
|                              | Eugene Ablordeppey | Danielle Beach      |
|                              | Sara Gubrud        | Lauren Tuttle       |
| <i>w/ J. Blain-Christen:</i> |                    |                     |
| 2016-2017:                   | Ryan Giudice       | Gareth Palas        |
|                              | Karthik Nambiar    | Mohammad Alhusayni  |
|                              | Quintin Woods      | Alexander Bugarin   |
|                              | John Sherman       | Kinjal Ahir         |
|                              | Matthew Devera     | Sharon Gooi         |
|                              | Lindsey Macias     | Caitlin Byrne       |
| <i>w/ N. Krishnamurthi:</i>  |                    |                     |
| 2015-2016:                   | María José Quezada | Arianna Moreno      |
|                              | Brandon Bartels    | Haley Sivertson     |
|                              | Vanessa Barker     | Candice Chen        |
|                              | Ujwala Vaka        | Joseph Del Rosario  |
|                              | Scott Ashmore      | Luke Lammers        |
|                              | Daniel Palmer      | Matsemela Moloji    |
|                              | Jason Van Egmond   | Jacob Schwarz       |



|            |                              |                     |
|------------|------------------------------|---------------------|
|            | <i>w/ B. Kelly:</i>          | William Langenbach  |
|            | Kirsten Jeffreys             | Taylor Deegan       |
|            | <i>w/ N. Krishnamurthi:</i>  | Vivian Vuong        |
|            | Tanya Singh                  | Miles Parris        |
|            | <i>w/ J. Blain-Christen:</i> | Ariana Richert      |
|            | Ashley Iveny                 | Jesse Munoz         |
|            | Rohan Kumar                  | Frank Petty         |
| 2014-2015: | Cody Lane                    | Sebern Sloan        |
|            | Ben Sears                    | Tanner Wright       |
|            | Dante Sadeghpour             | Chris Baroldy       |
| 2012-2013: | Joshua Hammer                | Andrea McFerren     |
|            | Steven Mullane               | James Bonelli       |
|            | Zoran Bundalo                | David DeJeu         |
|            | David Konves                 | Bronwyn Bitsilly    |
|            | Emily Christman              | Zachary Coovert     |
|            | Scarlett Schmale             | Kyle Thomas         |
|            | Benjamin Worth               | Brandon Hendrickson |
|            | Mitzi Thelakkaden            | Ranil Joshua        |
|            | Shean Howlett                | Tara Wright         |
|            | Ami Thakrar                  | Neekta Hamidi       |
|            | Thelma Okocha                | Vivek Devadas       |
|            | Victor Orioke                |                     |
| 2011-2012: | Mark O'Donnell               | David Medina        |
|            | Marizza Bravo                | Brad Rach           |
| 2010-2011: | Cameron Adler                | Raisa Ahmad         |
|            | Megan Anderson               | Nathan Bates        |
|            | Benjamin Cantrill            | Tasha Chesko        |
|            | Eric Collinge                | Walter Hafner       |
|            | Barry Hancher                | Ashley Jaeger       |
|            | Jeremy Jellish               | Christopher Kennely |
|            | Laura Kuning                 | Jennifer Lehrman    |
|            | Benjamin O'Toole             | Ben Teplistky       |
|            | Michael Trobiano             | John Spanias        |
|            | Shravan Sridhar              |                     |
| 2009-2010: | Osnat Artsi                  | Benjamin Bosch      |
|            | Alan Busovaca                | Jessica Butcher     |
|            | Cammi Kellar                 | Corina Prieto       |
|            | Christine Randolph           | Adrian Salazar      |
| 2008-2009: | Jason Clark                  | Coleman Bessert     |
|            | Alex Sitek                   | Greg Walton         |
|            | Manar Shahbandar             | Scott Kuhlman       |
| 2007-2008: | Sarah Balch                  | Chrissy Hobson      |
|            | Kaycee Halla                 | Shari Lassiter      |

|            |                 |                   |
|------------|-----------------|-------------------|
|            | Michael Kubany  | Matt Sondreaal    |
|            | Modesto Lopez   |                   |
| 2006-2007: | Jaime Stovall   | Noel Pense        |
|            | Kevan Bayne     | Jessie Helsey     |
|            | Michael Germain |                   |
| 2005-2006: | Mark Schmitz    | Leela Doppalapudi |
|            | Darjan Emkic    | Luis Landgrave    |
|            | Simon Lubek     | Samira Mirtalaei  |
|            | Mark Schmitz    | Chi-Hui Wang      |
|            | Nikhil Sadhwani |                   |
| 2004-2005: | David Breedlove | Tyson Padgett     |
|            | Edhem Sadikovic | Kimberly Yarnall  |
| 2003-2004: | Anjali Gupta    | Karen Lewis       |
|            | Darius Sanders  | Kellen Van Ausdal |

*Co-mentorship of Physical Therapy Research Projects:*

Doctorate in Physical Therapy Program, Arizona School of Health Sciences

Michelle Ducy, 2012-2013 (Primary mentor: James Lynskey, PT, PhD)  
 Kamini Halani, 2012-2013 (Primary mentor: James Lynskey, PT, PhD)  
 Kyle Cherney, 2010-2011 (Primary mentor: James Lynskey, PT, PhD)  
 Shaun Rice, 2010-2011 (Primary mentor: James Lynskey, PT, PhD)  
 Kristen Johnson, 2009-2010 (Primary mentor: James Lynskey, PT, PhD)  
 Kaitlin Clark, 2009-2010 (Primary mentor: James Lynskey, PT, PhD)

*Service on Doctoral Dissertation Committee:*

Harrington Department of Bioengineering/School of Biological and Health Systems Engineering, ASU:

Ian Akamine, PhD, expected 2022 (Advisor: Jennifer Blain-Christen, PhD)  
 Sulagna Saha, PhD, expected 2021 (Advisor: Rosalind Sadleir, PhD)  
 Nicholas Fritz, PhD, expected 2021 (Advisor: Jennifer Blain-Christen, PhD)  
 Peiyuan Boki Wang, PhD, expected 2021 (Advisor: Sydney Schaefer, PhD)  
 Markey Olson, PhD, expected 2021 (Advisor: Thurmon Lockhart, PhD)  
 Jonathan Garich, PhD, expected 2021 (Advisor: Jennifer Blain-Christen)  
 Vladislav Voziyanov, PhD, expected 2021 (Advisor: Jit Muthuswamy, PhD)  
 Saba Rezvanian, PhD, 2019 (Advisor: Thurmon Lockhart, PhD)  
 Steven Lathers, PhD, 2018 (Advisor: Jeffrey LaBelle, PhD)  
 Swathy Sampath Kumar, PhD, 2018 (Advisor: Jit Muthuswamy, PhD)  
 Aprinda Indahlastari, PhD, 2017 (Advisor: Rosalind Sadleir, PhD)  
 Sindhu Anand, PhD, 2013 (Advisor: Jit Muthuswamy, PhD)  
 Brian Hillen, PhD, 2012 (Advisor: Ranu Jung, PhD)  
 Lisa Raleigh, PhD, 2010 (Advisor: Marco Santello, PhD)  
 Lubna Ahmad, PhD, 2009 (Advisor: Lokesh Joshi, PhD)  
 Mallika Fairchild, PhD, 2009 (Advisor: Ranu Jung, PhD)  
 Sivakumar Balasubramanian, PhD, 2009 (Advisor: Jiping He, PhD)

Joseph Graham, PhD, 2008 (Advisor: Ranu Jung, PhD)  
Jacob Goble, PhD, 2007 (Advisor: Natalia Dounskia, PhD)  
Helen Huang, PhD, 2006 (Advisor: Jiping He, PhD)

Mathematics, School of Mathematical and Statistical Sciences, ASU:

Russel Jarvis, PhD, 2020 (Advisor: Sharon Crook, PhD)

Mechanical Engineering, School of Engineering of Matter, Transport and Energy, ASU:

Masood Nevisipour, PhD, 2019 (Advisor: Claire Honeycutt, PhD)

Department of Electrical Engineering, ASU:

Shivkumar Sebasan, PhD, 2008 (Advisor: Leon Iasemidis, PhD)  
Niranjan Charkravarthy, PhD, 2007 (Advisor: Leon Iasemidis, PhD)

Department of Kinesiology, ASU:

Christopher Colloca, PhD, 2015 (Advisor: Richard Hinrichs, PhD)  
Mu Qiao, PhD, 2012 (Advisor: Devin Jindrich, PhD)

Department of Biomedical Engineering, Florida International University:

Arianna Ortega Sanabria, PhD, expected 2023 (Advisor: Ranu Jung, PhD)  
Anil Thota, PhD, expected 2021 (Advisor: Ranu Jung, PhD)  
Sathyakumar Kuntaegowdanahalli, PhD, expected 2021 (Advisor: Ranu Jung, PhD)  
Ashfaq Ahmed, PhD, expected 2021 (Advisor: Ranu Jung, PhD)  
Andres Pena, PhD, 2020 (Advisor: Ranu Jung, PhD)  
iiian Black, PhD, 2019 (Advisor: Ranu Jung, PhD)  
Ricardo Siu, PhD, 2019 (Advisor: Ranu Jung, PhD)

Institute of Biomaterials and Biomedical Engineering, University of Toronto:

Albert Vette, PhD, 2011 (Advisor: Milos Popovic, PhD)

Neuroscience and Mental Health Institute, University of Alberta:

Ashley Dalrymple, PhD, 2018 (Advisor: Vivian Mushahwar, PhD)

Faculty of Mechanical and Chemical Engineering, Kwame Nkrumah University of Science and Technology (KNUST), Kumasi, Ghana:

Eric Akowuah, PhD, 2019 (Advisors: J. Ampofo and P.Y. Andoh, PhD; Abbas role: External Examiner)

Department of Electronics and Communication Eng., Thapar University, Patiala, India:

Amanpreet Kaur, PhD, 2017 (Advisors: R. Agarwal and A. Kumar, PhD; Abbas role: External Reader)

Department of Kinesiology and Health Promotion, University of Kentucky:

Timothy Brindle, PhD, 2001, (Advisor: Robert Shapiro, PhD)

*Service on MS Thesis Committee:*

Harrington Department of Bioengineering/School of Biological and Health Systems Engineering, ASU:

Theophilus Annan, MS, expected 2021 (Advisor: Claire Honeycutt, PhD)  
Anngela Adams, MS, 2017 (Advisor: Jeffrey LaBelle, PhD)

Sanchit Chirania Nolasname, MS, 2016 (Advisor: Bruce Towe, PhD)  
Siva Palaniswamy, MS, 2016 (Advisor: Jit Muthuswamy, PhD)  
Rashaad Sidique, MS, 2010 (Advisor: Bruce Towe, PhD)  
Shawna Fletcher, MS, 2010 (Advisor: Christopher Buneo, PhD)  
Simon Lubeck, MS, 2010 (Advisor: Kevin Bennett, PhD)  
Samhavi Subramanian, MS, 2010 (Advisor: Ranu Jung, PhD.)  
Kimberly Tan, MS, 2009, (Advisor: James Sweeney, PhD)  
Jeremy Crandell, MS, 2007, (Advisor: Stephen Helms-Tillery, PhD)  
Joseph M. Guerricabeitia, MS, 2006, (Advisor: James Sweeney, PhD)  
Adam Bellanger, MS, 2005 (Advisor: Ranu Jung, PhD)  
Ganapriya Venkatasubramanian. MS, 2005 (Advisor: Ranu Jung, PhD)  
Patrick Koegler, MS, 2004, (Advisor: Gary Yamaguchi, PhD)  
Ryan Knight, MS, 2003, (Advisor: Jiping He, PhD)  
Matthew Dixon, MS, 2003, (Advisor: Gary Yamaguchi, PhD)  
Jeremy Crandell, MS, 2003, (Advisor: Gary Yamaguchi, PhD)

Center for Biomedical Engineering, University of Kentucky:

Nicole Cleary, MS, 2002, (Advisor: Eugene Bruce, PhD)  
Kegang Hua, MS, 2002, (Advisor: Dayong Gao, PhD)  
Heng Wang, MS, 2000, (Advisor: Ranu Jung, PhD)  
Sarvani Grandhe, MS, 1999, (Advisor: Ranu Jung, PhD)

Department of Electrical Engineering, University of Kentucky:

Hock Jin Lee, MS, 1997, (Advisor: Elizabeth J. Brauer, PhD)

Department of Kinesiology and Health Promotion, Univ. of Kentucky:

Elizabeth A. Knapp, MS, 1996, (Advisor: Robert Shapiro, PhD)

Department of Mechanical Engineering, The Catholic Univ. of America:

Thang Dang, MS, 1994, (Advisor: Jack Winters, PhD)

*Service on Undergraduate Honors Thesis Committee:*

Engineering, The Polytechnic School, ASU:

Miles Miller, BS, Barrett Honors College, 2018 (Advisor: Mark Henderson, PhD)

Harrington Department of Bioengineering, ASU:

Charles McCartney, BS, Barrett Honors College Thesis, 2005 (Advisor: J. Davidson)

Taryn Jansen, BS, Barrett Honors College Thesis, 2004 (Advisor: Ranu Jung, PhD)

Speech & Hearing Sciences, ASU:

Cynthia Dana, BS, 2003, Barrett Honors College Thesis (Advisor: M. Dorman, PhD)

Department of Kinesiology, ASU:

Lisa Schroeder, BS, 2012, Barrett Honors College Thesis (Advisor: R. Hinrichs, PhD)

Brian Brown, BS, 2010, Barrett Honors College Thesis (Advisor: Devin Jindrich, PhD)

Travis Johnson, BS, 2005, Barrett Honors College Thesis (Advisor: K. Matt, PhD)

Department of Psychology, ASU:

Stanley Brewer, BS, 2008 Honor Thesis (Advisor: Eddie Casteneda, PhD)

**TEACHING:**

Arizona State University: 2002-present

The ASU Experience (ASU 101)  
Engineering Perspectives on Biological Systems (BME 111)  
Design of Experiments/Clinical Trials (BME 394, BME 361, course number change)  
Biomechanics (BME 416, BME 494/BME 598, combined lecture sessions)  
Biomedical Instrumentation Lab (BME 423)  
Technology for Global Health (BME 494/BME 598, combined lecture sessions)  
Human Systems Neuroscience (BME 556/NEU 556, cross-listed)  
Applied Projects (BME 593; coordinator, not included in totals)  
Modeling and Simulation of Physiological Systems (BME 598)  
Neural Prostheses (BME 598)  
Introduction to Neural Engineering (BME 598)  
Neuromechanics of Balance and Gait (BME 598)  
Modeling Neuromechanical Systems (BME 598)

Lectures in:

Introduction to Bioengineering (BME 100, 101)  
The ASU Experience (ASU 101)  
Engineering Perspectives on Biological Systems (BME 111)  
Grand Challenges for Engineering (FSE 150)  
Perspectives on Grand Challenges for Engineering (FSE 194)  
Bioengineering Product Design (BME 300)  
Motor and Developmental Learning (KIN 345)  
Microcomputer Applications in Bioengineering (BME 370)  
Best Practices in Humanitarian Engineering (EGR 371)  
Biomedical Instrumentation (BME 413)  
Biomedical Engineering Capstone Design (BME 417)  
Biocontrol Systems (BME 419)  
Neurobiology (BIO 467)  
Systems & Behavioral Neuroscience (BIO 477)  
Scientific Communications (BME 598)  
Computational Neuroscience (BME 598)  
Systems Neurophysiology (BME 598)  
Human Systems Neuroscience (BME 598)  
Advanced Physiology (BME 598)  
Anatomy & Biomechanics (BME 598)  
Technology for Global Health (BME 598)  
CNS Injury and Repair (Neurological Sciences Block, U. of Arizona Medical School)  
Neuromotor Assessment (Doctorate of Physical Therapy Program, Franklin Pierce Univ.)  
Human-Centered Design of Assistive and Adaptive Technology for People with Disabilities (IGERT, BME 598)

The University of Kentucky: 1995- 2002

Biomedical Control Systems I (BME 610)

Biomedical Applications of Neural Networks (BME 699-002)

Advanced Biomedical Control Systems (BME 699-004)

Independent Study Supervision:

Neural Networks for Biomedical Control (BME 781-004)

Independent Work in Biology (BIO 395)

Team taught or delivered lectures in:

Measurement and Characterization of Muscle Function (BME 481-G)

Engineering Techniques for Assessment and Treatment of Adult Neurological Disorders  
(BME 781-006; team taught)

Biomedical Instrumentation (BME 530; team taught)

Foundations of Biomedical Engineering (BME 501; team taught)

Neural Engineering (EE 599)

Muscle Physiology (KHP 781)

Research Methods in Rehabilitation (Physical Medicine & Rehabilitation)

The Catholic University of America: 1993-1995

Engineering Mechanics I (ENGR 201)

Biological Systems & Control (BE 516)

Human Locomotion (BE 522)

Neural Stimulation in Rehabilitation (BE 531)

Modeling Neural Systems (BE 532)

Neural Control Systems (BE 732)

Nonlinear Dynamics of Physiological Systems (BE 733)

## **PROFESSIONAL ACTIVITIES AND SERVICE**

### **NATIONAL/INTERNATIONAL OFFICES**

#### *National Committees:*

Nov. '19 - present      Steering Committee, Data Resource Center, National Institutes of Health SPARC Initiative (Stimulating Peripheral Afferents to Relieve Conditions)

#### *Editorships (journals):*

June '09 - present      Review Editor,  
Frontiers in Neuroengineering

June '03 - present      Editorial Board,  
Journal of Neuroengineering and Rehabilitation

Jan '17 – Dec '20      Editorial Board,  
Bioelectronics in Medicine

Oct. '14 – Mar. '17      Associate Editor,  
International Journal of Clinical Engineering and Health Technology Assessment (CEHTA)

#### *Editorships (conferences):*

Dec. '14 – present      Associate Editor,  
IEEE Neural Engineering Conference

April '10 – present      Associate Editor,  
IEEE EMBS Conference Editorial Board (CEB)

#### *Other Editorships:*

Sept. '99                  Assistant Editor,  
*Assistive Technology*,  
Special Issue on Functional Electrical Stimulation.

June - Dec. '96          Section Co-Editor,  
"Section IV: Neuromechanical Interaction in Rhythmic Systems" in  
Biomechanics and Neural Control of Movement,  
Ed. by J.M. Winters & P.E. Crago, Springer-Verlag, 2000.

#### *Offices:*

Jan '02 – '12              Member, Rehabilitation Engineering Advisory Panel,  
Rehabilitation Engineering Research Center on Recreational  
Technologies, University of Illinois, Chicago.

Jan. '02 – Dec. 04      Treasurer, Intl. Functional Electrical Stimulation Society (IFESS)

- Sept. '00 - Sept. '03 Chair,  
Special Interest Group on Functional Neuromuscular Stimulation,  
RESNA.
- Sept. '99 - Sept. '00 Chair-elect,  
Special Interest Group on Functional Neuromuscular Stimulation,  
RESNA.

*Conference Organizing Committee/Track Chair:*

- June '19 – Feb. '20 International Organizing Committee  
Indo-US Conference on Bioengineering and Regenerative Medicine  
Varanasi, India, 2020
- Oct. '17 Respiratory Bioengineering Track Chair  
Biomedical Engineering Society Annual Meeting  
Phoenix, AZ, 2017
- Oct. '14 Global Health Technologies Subtrack Organizer,  
Biomedical Engineering Society Annual Meeting  
San Antonio, TX, 2014
- Nov. '13 Programme Committee Coordinator,  
Local Organizing Committee Member, and  
Workshop Organizer (Local Production of Medical Devices)  
2<sup>nd</sup> WHO Global Forum on Medical Devices, Geneva, Switzerland
- Sept. '08 Organizing Committee and Technical Program Committee,  
Annual Conference of the International Functional Electrical  
Stimulation Society (IFESS), Freiburg, Germany
- Jan '03 – June 03 Member, Scientific Program Committee,  
Annual Conference of the Internal Functional Electrical Stimulation  
Society (IFESS), Queensland, Australia.
- July '00 – June 01 Member, Scientific Program Committee,  
Annual Conference of the Internal Functional Electrical Stimulation  
Society (IFESS), Cleveland, OH.

*Conference Session Chair/co-Chair:*

- July '18 Session Chair,  
Neural Stimulation Session,  
IEEE/EMBS Conference, Honolulu, HI, 2018
- July '18 Session Co-Chair,  
Neuromuscular Systems Session,  
IEEE/EMBS Conference, Honolulu, HI, 2018
- Sept. '07 Session Co-Chair,  
Neural Stimulation and Rehabilitation Session,  
BMES Annual Meeting, Los Angeles, California.



- Sept. '03            Session Co-Chair,  
Functional Electrical Stimulation Session,  
IEEE/EMBS Conference, Cancun, Mexico.
- Oct. '02            Session Co-Chair,  
Functional Electrical Stimulation Session,  
Joint EMBS/BMES Conference, Houston, TX.
- June '01            Session Co-Chair,  
Biomechanics, Modeling and Control Session,  
Annual Conference of the Internal Functional Electrical Stimulation  
Society (IFESS), Cleveland, OH.
- April '00            Session Chair, Computational Models of Neural Control of Movement:  
Failure and Recovery Session.  
Neural Control of Movement Conference, Key West, FL
- October '98        Session Co-Chair,  
Musculoskeletal Modeling Session, BMES Conference, Cleveland, OH.
- October '98        Session Co-Chair,  
Measurement Devices & Control Session, BMES Conf., Cleveland, OH.
- October '94        Session Co-Chair,  
Young Investigator Symposium, Neural Prosthesis Workshop,  
National Institutes of Health, Bethesda, MD.
- April '94            Session Co-Chair,  
Neuromotor Control Systems Session,  
13<sup>th</sup> Southern Biomedical Engineering Conference, Washington, DC.

**INVITED REVIEWER**

*Chair, Funding Agency Review Panels:*

National Institutes of Health:

National Institute for Child Health and Development, Chair, Special Emphasis Panel (2013)

National Institute for Child Health and Development; Function, Integration and Rehabilitation Subcommittee; National Center for Medical Rehabilitation Research, Chair, ad hoc panel (2013a,b)

Congressionally-Directed Medical Research Program:

Panel Chair (2015; 2014a,b; 2012; 2011; 2010)

*Standing Member, Funding Agency Review Panel:*

National Institutes of Health:

Function, Integration and Rehabilitation Subcommittee, National Center for Medical Rehabilitation Research, Standing Member (2006-2010)

Department of Education:

National Institute for Disability and Rehabilitation Research Field Initiated Research Review Panel Standing Member, (1999-2003)

*Member, Funding Agency Review Panel:*

National Institutes of Health:

National Institute for Child Health and Development; Medical Rehabilitation Research Resource Program (2019)

Translational and Next Generation Brain Device Review (2018)

SBIR Health Disparities (2016)

New Innovator Award Program (2014)

Rehabilitation Research Career Development Programs, National Center for Medical Rehabilitation Research, (2012)

Musculoskeletal Rehabilitation Sciences Study Section (2012)

EUREKA Study Section (2011)

National Center for Medical Rehabilitation Research, ad hoc reviews (2011, 2010)

National Institute of Neurological Disorders & Stroke, Special Emphasis Panel (2007)

National Institute of Neurological Disorders and Stroke Initial Review Group (2006)

Clinical Neuroscience and Disease Study Section (2006 a,b)

National Center for Medical Rehabilitation Research, Special Study Section (2006, 2005)

Brain Disorders and Clinical Neurosciences-1, Ad-hoc member (2007; 2006; 2005a,b,c; 2004a,b,c; 2001)

Medical Rehabilitation Research Subcommittee Study Section (2002)

Human Brain Project Special Emphasis Study Section (2002)

Geriatrics and Rehabilitation Medicine Study Section (2002, 2001)

Multidisciplinary Clinical Sciences Special Emphasis Study Section (9 panel meetings, 1995-1999).

Department of Education:

National Institute for Disability and Rehabilitation Research Rehabilitation  
Engineering Research Center Panel, (2004)

National Institute for Disability and Rehabilitation Research Small Business  
Innovation Research Review Panel, (2001, 2000)

National Science Foundation:

Neural and Cognitive Systems, Neuroengineering Review Panel (2018)

Biomedical Engineering Career Awards Review Panel (2001)

Biomedical Engineering Research to Aid Persons with Disabilities Panel (2001, 2000)

Biological Systems Analysis & Control Panel (1995)

Biomechanics & Rehabilitation Panel (1994)

Congressionally-Directed Medical Research Program:

Peer-Reviewed Medical Research Panel (2019, 2017, 2015, 2014)

Department of Veterans Affairs, Rehabilitation Research & Development  
(2015, 2013, 2010, 2003)

Department of Defense:

US Army MRMCM (2016, 2008)

Canada Foundation for Innovation (2009)

*Proposal Reviews, ad hoc:*

Natural Sciences and Engineering Research Council of Canada (2020, 2018, 2017)

New York University, Abu Dhabi (2020)

Israel Science Foundation (2019)

Paralyzed Veterans of America (2020, 2019, 2017)

Innovation and Technology Commission, Government of Hong Kong (2017)

Medical Research Council, United Kingdom (2012)

Neurological Foundation of New Zealand (2009)

Netherlands Technology Foundation (2009)

University of Wisconsin (2008)

Barrow Neurological Institute (2007 a,b).

University of Southern California.

The National Academies (2003).

National Science Foundation:

Integrative Biology and Neuroscience, Ad-hoc Review (2001)

Instrument Development for Biological Research, Ad-hoc Review (2000)

Computational Neuroscience, Ad-hoc Reviewer (1996)

Behavioral Neuroscience. Ad-hoc Reviewer (1996)

*Journals:*

Bulletin of the World Health Organization

PLOS ONE

PLOS Computational Biology

Journal of Neuroengineering and Rehabilitation

IEEE Transactions on Biomedical Engineering

IEEE Transactions on Rehabilitation Engineering

IEEE Transactions on Systems, Man & Cybernetics

Frontiers in Neuroscience  
 Frontiers in Neuroengineering  
 Annals of Biomedical Engineering  
 Neuromodulation  
 Experimental Neurology  
 Journal of Spinal Cord Medicine  
 Scholarpedia  
 Computers in Biology and Medicine  
 Assistive Technology  
 Intelligent Systems Engineering  
 Biomedical Instrumentation and Technology  
 Advances in Skin and Wound Care  
 Physics in Medicine & Biology  
 Journal of Rehabilitation Research and Development  
 Health and Technology

*Conferences:*

IEEE Neural Engineering Conference  
 Design of Medical Devices Conference  
 WHO Global Forum on Medical Devices  
 Internal Functional Electrical Stimulation Society Annual Conference  
 IEEE Engineering in Medicine & Biology Conference  
 Biomedical Engineering Society Conference  
 Canadian National Spinal Cord Injury Conference  
 Rehabilitation Engineering Society of North America Conference

**UNIVERSITY SERVICE**

Arizona State University

University-Level Committees:

|                |   |
|----------------|---|
| 2016 - present | Member, Limited Submissions Review Committee, Knowledge Enterprise Development.                     |
| 2016 - 2020    | Member, Advisory Board, Global Resolve.   |
| 2010 - 2013    | Senator, Faculty Senate, Representative of the School of Biological and Health Systems Engineering. |

Fulton Schools of Engineering (Dean's Level):

|                |   |
|----------------|---|
| 2019 – present | Member, Diversity and Inclusion Initiative, Ira A. Fulton Schools of Engineering.   |
| 2017 - present | Member, Faculty Review Committee, Master's Opportunity for Research in Engineering Program, Ira A. Fulton Schools of Engineering. |
| 2017 - 2019    | Co-Chair, Dean's Faculty Advisory Council (Dean's-level Promotion and Tenure Council), Ira A. Fulton Schools of Engineering.      |
| 2014 - 2019    | Member, Grand Challenge Scholars Faculty Oversight Committee, Ira A. Fulton Schools of Engineering.                               |

|             |   |
|-------------|---|
| 2015 - 2018 | Member, Dean's Limited Submissions Review Committee, Ira A. Fulton Schools of Engineering.          |
| 2014 - 2018 | Faculty Advisor, Student Chapter of Engineering World Health, Ira A. Fulton Schools of Engineering. |
| 2015 - 2017 | Member, Dean's Faculty Advisory Council, Ira A. Fulton Schools of Engineering.                      |
| 2012 - 2013 | Faculty Advisor, Student Chapter of Engineering World Health, Ira A. Fulton Schools of Engineering. |
| 2011 - 2013 | Member, Dean's Executive Committee, Ira A. Fulton Schools of Engineering.                           |
| 2009 - 2013 | Member, Grand Challenge Scholars Faculty Oversight Committee, Ira A. Fulton Schools of Engineering. |
| 2009 - 2011 | Member, Health Care Search Committee, Ira A. Fulton Schools of Engineering                          |

School of Biological and Health Systems Engineering:

|                |  |
|----------------|--|
| 2020 - present | Co-leader, <i>ad hoc</i> Committee on Diversity, Equity and Inclusion, School of Biological and Health Systems Engineering.                                  |
| 2018 - present | Member, Computing Curriculum Committee, School of Biological and Health Systems Engineering.   |
| 2017 - present | Faculty Representative, Strengthening Institutional Linkages Program with Kwame Nkrumah University of Science and Technology (KNUST), Mastercard Foundation. |
| 2016 - 2017    | Member, Biomedical Device Design Search Committee, School of Biological and Health Systems Engineering   |
| 2014           | Member, Personnel Committee, School of Biological and Health Systems Engineering.  |
| 2011 - 2013    | Member, Personnel Committee, School of Biological and Health Systems Engineering.  |
| 2005 - 2006    | Member, Department Chair Search Committee, Bioengineering.   |
| 2003 - 2004    | Chair, Neuroprosthesis Search Committee, Bioengineering.   |
| 2003 - 2004    | Member, BioMEMS Search Committee, Bioengineering.  |
| 2003 - 2004    | Member, Motor Control Search Committee, Bioengineering.  |
| 2003 - 2004    | Member, Biomechanics Search Committee, Bioengineering.   |
| 2003 - 2007    | Member, Personnel Committee, Bioengineering.   |
| 2005 - 2006    | Member, Safety Committee, Bioengineering.  |

Other Units/Institutions:

Department of Biomedical Informatics, ASU:

|             |  |
|-------------|--|
| 2010 - 2013 | External Member, Promotion and Tenure Committee, Department of Biomedical Informatics. |
|-------------|--|

Department of Electrical Engineering, ASU:

2006 - 2007 Member, Biosensors Search Committee, Electrical Engineering.

University of Arizona College of Medicine - Phoenix

2008 - 2010 Member, Research Planning Committee, Neurosciences

Banner Good Samaritan Medical Center

2007 - 2009 Chair, Data Safety and Monitoring Board, Memantine Effects on ALS

University of Kentucky: Center for Biomedical Engineering

2001 Chair, Faculty Search Committee.

2001 Chair, Teaching Lab Upgrade Committee.

1997 – 2002 Member, Research Program Development Committee.

1997 – 2002 Member, Educational Program Development Committee.

1995 – 1999 Coordinator, Website Development Committee.

University of Kentucky: Department of Physical Medicine & Rehabilitation

2001 - 2002 Chair, Research Committee.

2001 - 2002 Chair, Multi-disciplinary Spinal Cord Injury Research Committee.

2001 - 2002 Member, Search Committee for Endowed Chair.

2000 Member, Research Day Planning and Organization Committee.

1997 - 2001 Member, Multi-disciplinary Spinal Cord Injury Research Committee.

1996 - 2001 Member, Research Committee.

1999 Member, Research Day Planning and Organization Committee.

1998 Member, Research Day Planning and Organization Committee.

University of Kentucky: Spinal Cord and Brain Injury Research Center

2000 - 2002 Member, Internal Advisory Board

2000 - 2001 Member, Conference Organizing Committee, *Clinical Advances in Neurorehabilitation Science*

2000 Member, Planning Committee, *KY Spinal Cord and Head Injury Research Conference*

University of Kentucky: Department of Kinesiology and Health Promotion

2000 - 2002 Member, Doctoral Program Advisory Board.

University of Kentucky: Department of Special Education and Rehabilitation Counseling

1995 - 2002 Member, Consumer Advisory Board, Technology Subcommittee.

University of Kentucky: Graduate School

2000 - 2002 Member, Biomedical Sciences Panel of the Graduate Council Committee on Fellowships and Traineeships