

RANU JUNG, PHD

Center for Adaptive Neural Systems
PO Box 874404
Arizona State University
Tempe, AZ 85287-4404

Tel: 480-965-9052

email: ranu.jung@gmail.com (personal)
ranu.jung@asu.edu (work)

The first section of this document provides a brief overview of the most important initiatives that I have been involved in recently. The second section provides additional details.

LEADERSHIP & ADMINISTRATION

Throughout my career, I have had several opportunities to take on leadership roles in order to serve the institution, the local community or the international research community. These experiences, as briefly described below and chronicled in the detailed curriculum vitae, have been particularly significant in providing me the opportunity to listen and learn, to develop strategic plans, to hone my administrative and organizational skills and to lead in a shared governance model.

Co-Founder and Co-Director, Center for Adaptive Neural Systems (CANS), ASU

In 2002, Dr. James Abbas and I established a transdisciplinary research center (initially named the 'Center for Rehabilitation Neuroscience and Rehabilitation Engineering'). Our Center's mission is to seek new knowledge and develop engineering technology that addresses the complex physiological, medical and societal problems presented by neurological disability. We use a transdisciplinary approach to address real world problems that lie at the interface between bioengineering, neuroscience and rehabilitation. The Center, which functions like an organized research unit and can be a financial lead for grant proposal submissions, has grown to include 13 faculty from engineering, life and physical sciences, 11 clinical affiliates from Phoenix valley medical institutions, post-doctoral fellows, students and technical and administrative staff. In 2008 CANS solidified its role as an interdisciplinary center when it received official recognition by the Arizona Board of Regents.

As co-director, I have worked to define the Center's mission and vision, establish research facilities, develop web presence and instate operational procedures for hiring staff, budget management, purchasing and delivery, research proposal submissions, regulatory compliance for Environmental Health & Safety, Institutional animal care and use and Human subject study review boards. Both co-directors are also responsible for yearly performance and merit raise reviews of all Center research faculty and staff.

To-date, the primary accomplishments of the Center have been to develop multi-investigator research facilities, form the administrative and operational infrastructure to support large research efforts, form research teams for multi-disciplinary projects, create strong ties to clinicians at four major medical centers, and establish a funding base of external support to launch a number of applied research projects. Our primary five-year goal is to have a substantial impact on the field of neurorehabilitation by delivering at least one product of ANS-developed technology into clinical practice.

President, Organization for Computational Neurosciences, Inc. (OCNS)

In 2002, I helped found OCNS, Inc., a US non-profit 501(c)(3) to serve the needs of an international community of scientists actively engaged in using quantitative tools to address questions in neuroscience. In 2006, I was elected President for a three year term. As President, I lead an international Board and Executive committee of scientists. I took office with a promise to establish an international presence for the fledgling organization, institute a new operational infrastructure and improve the financial standing.

As President, I introduced a distributed shared governance model. We have successfully improved our branding (new web page, logo design, social networking), international banking capabilities, use of information technology apps to allow smooth communication amongst the board members who are distributed globally, and sponsorship of various OCNS activities. OCNS, Inc. is now listed as the primary organization under the category "Computational Neuroscience" in Wikipedia.

Over the past 3 years, I led the establishment of formal procedures for inviting and evaluating proposals to host the annual conference, increased conference sponsorship, negotiated a grant and publication royalties through a major publisher, and obtained substantial federal support for travel awards to students, postdoctoral fellows who lead workshops, tutorial lecturers, invited speakers, and a “Frontiers in Computational Neuroscience Lecture”. The most recent annual meeting, CNS*2009, which was held in Berlin, Germany constituted the largest international computational neuroscience conference to date (>650 attendees, 32 countries).

Leadership in Developing Academic-Industrial-Clinical Partnerships

I have a proven record for establishing successful partnerships. A partnership between faculty from bioengineering, electrical engineering and kinesiology with industry (Cochlear, Ltd. (Australia) and Motion Control Inc. Utah), a clinical team (Mayo), and a clinical prosthetic practice (Artificial Limb Specialists) allowed us to successfully compete for a NIH Bioengineering Research Partnership (BRP) grant (the only lead BRP grant at ASU). This BRP, which was successful on its initial submission, is supporting the engineering development and clinical implementation of a novel fully implanted neural interface between a myoelectric hand and below-the-elbow amputees via peripheral nerves to allow sensory feedback. Besides my personal technical contributions to the project, as leader of the team, I am responsible for all management including negotiating intellectual property agreements, scope of work for each sub-contractor, budgets and milestone delivery.

I also established a collaboration between academic partners (ASU and Univ. of Michigan), clinical neuroscience partner (Barrow Neurological Institute) and industry (E^xponent, Inc) to obtain funding for a joint NSF-NIH program on Collaborative Research in Computational Neuroscience.

Pivotal role in establishing a Phoenix valley-wide small animal imaging center

Shortly after arriving at ASU, I was invited by Flinn Foundation to serve on committees charged with identifying key opportunities for development of the bioscience infrastructure in Arizona. As an outgrowth of this activity, I took the initiative to identify and organize potential users of a Phoenix area small animal imaging facility and then successfully competed for funding from the NIH-NCRR High-End Instrumentation grant program for a 7-Tesla Magnetic Resonance Imaging and *in vivo* Spectroscopy System. After securing the funds, I worked with architects to develop building plans, identified vendors, arranged for site visits, solicited bids and ultimately negotiated a \$1.6M package. My pivotal role and success in this effort allowed formation of a joint Barrow Neurological Institute (BNI)-ASU pre-clinical imaging center, located at BNI. This new center was inaugurated in 2009 and has helped establish a strong clinical partnership for ASU. Since securing the MR infrastructure, ASU has recruited two Assistant Professors with imaging expertise and an undergraduate track of courses in imaging has been launched.

Service on Federal Committees and State Commissions (selected)

- Service on various National Institutes of Health (NIH) and National Science Foundation (NSF) and some international federal committees and review panels to evaluate individual research proposal submissions
- As member of the NIH Council for Scientific Research advisory committee guided the formation of a new permanent review panel for evaluation of neurotechnology, neuroinformatics and computational neuroscience proposals.
- Site reviewer and evaluator for P41 national research centers for NIH and Engineering Research Centers for the Directorate of Engineering and Science of Learning Centers for the Directorate of Social, Behavioral and Economics Research for NSF.
- Technical Advisory Board for the Arkansas Science & Technology Authority, Little Rock, Arkansas.
- Commissioner to the Arizona Biomedical Research Commission, Appointed in 2009 by the Arizona Governor.

Strategic Planning, Hiring and Advising Committees at Arizona State University (selected)

- Appointed to the “Leadership Development Initiative” of the “Office for Developing Transformational Leaders”, Arizona State University (1 of 13 faculty from 6 colleges) by University Provost/Vice President.
- Member, President’s Academic Advisory Council (2006-present): This committee meets with the President of ASU, two or more times yearly, to provide feedback on multiple Presidential initiatives.

- Graduate Faculty (Summer '07): served on a small group of faculty from across the University to restructure its faculty into a graduate faculty model, where faculty from multiple departments/schools cluster to guide and manage graduate disciplinary degrees.
- Faculty International Committee (May '07 –present): provided strategic planning input and helped design and implement a seed-grant program to support faculty initiatives in global engagement activities,.
- Member, Provost Search Committee (Dec '05-May '06): selected final candidates for consideration for the position of Provost and Vice President to the University President and upper administration.
- Member Promotion & Tenure Committee (2003-2007), Harrington Department of Bioengineering.

Faculty Counselor to Society of Women Engineers (SWE) Student Chapter

As faculty counselor of the Student Chapter at Univ. of Kentucky from 1997 to 2002, I had the opportunity to interact with and guide an outstanding group of young women engineering students. I guided their monthly activities, annual off-site overnight retreats, industrial liaison efforts and organization of a Regional Conference. I made multiple industry contacts to increase industry participation in the annual engineering career fair (run by SWE students) and to get information about summer internships and co-op opportunities for the students. Under my tenure, the organization won Best Student Section in the Nation (1998), National Team-Tech award (1997, 1998) (Multidisciplinary teams worked through the year on a real-world problem identified by an industrial partner; solutions were adopted by the industrial partners), National TRW Foundation Scholarship (1997, 1998, 2000), National Best Audio-Visual Presentation (1998), National Scribe award (1997); Academic Scholarship (1998, 2000), and Best Student Section Region-G (26 sections) (1997, 1998, 1999). We also established the “Margaret Ingels Society of Women Engineers Graduate Fellowship” through a \$50,000 endowment created from proceeds from the engineering career fair run by the student chapter.

Conference organization

I have organized international, national and local conferences, symposia, workshops and meeting sessions. These have included those that primarily required identification of speakers to those that have required defining the theme and laying the agenda, managing budgets, lodging, travel support, and operations.

Co-founder of small business R&D company

In 2004, I co-founded a small business research and development company, Advensys, LLC. With Phase-I and Phase-II financial support from the ARMY, the company has designed and developed a patent-pending neuromorphic-orthotic control system (NOCS™) that includes “intelligent” biomimetic control-circuitry and a powered orthosis to provide crutch-free walking for soldiers with transtibial injuries. My responsibilities included hiring engineers and managing business operations (payroll, banking, purchasing & inventory).

RESEARCH

As a biomedical engineer trained in both the experimental and quantitative study of neurophysiological processes, I have had the privilege to be at the forefront of the emergence of Computational Neuroscience and Neural Engineering and I have directed my efforts to advance these fields through research, teaching and service. My personal research effort has established and expanded a program that fuses the two fields to develop biologically inspired neurotechnology and that translates laboratory research into clinical application. The research provides the foundation for our expanding efforts at translating neurotechnology into the clinic in order to enhance the state-of-the-art in neurorehabilitation. The broader impact of this program is that it has provided new electrode technologies that can be used in other scientific and rehabilitation applications, new insights into adaptive neural processes that can be utilized to promote learning and recovery, and new engineers and scientists trained in the transdisciplinary fields of Computational Neuroscience and Neural Engineering.

Some of the key features and successes of my research program are:

- Multi-disciplinary research environment that has included engineers, mathematicians, neuroscientists, and clinicians. The laboratory has also provided vertical integration of high school students, undergraduates from life-sciences and engineering, graduate students, post-docs, clinical fellows, and lead investigators.

- Use-inspired research and intellectual fusion across disciplinary boundaries with a goal towards development of technology to improve quality of life, particularly for those with neurotrauma.
- Broad research scope that has included extensive utilization of a chronic rodent model of neurotrauma, kinematic and kinetic analyses in awake behaving animals, electrophysiological recordings in behaving or anesthetized animals, the development of new techniques to process neural signals, development and use of mathematical models of neural and musculoskeletal signals, computerized microscopy of neural tissue, the design and development of novel electrode technologies, and real-time interaction of electronic hardware with spinal and peripheral neural tissue. Considerable current effort is directed towards development of implanted neural interfaces for sensory feedback to amputees that use prosthetic hands.
- Diverse funding base that has included federal funding from the National Institutes of Health, National Science Foundation and Army Research Office as well as State and Private organizations. I have been PI or Co-PI on 22 research projects, 4 research and education infrastructure equipment grants, and 4 planning and conference grants for a total of about \$10M. I have also been co-investigator on 7 other funded grants.
- Leadership in the development of multi-disciplinary, multi-institutional partnerships between academic, industry and clinical units. I have led teams of multi-disciplinary investigators. Collectively, these partnerships have included 8 universities, 4 companies and 3 clinical institutions.
- First to implement and demonstrate a biohybrid closed-loop system between the spinal cord and a neuromorphic electronic circuit (Abstract 1999, Manuscript 2001).
- First to develop a rodent model for neuromuscular electrical stimulation based limb movement (Abstracts 2003, First Manuscript 2008; set of 4 manuscripts).
- Publication of 27 peer reviewed journal articles, 1 in revision, 1 in review, 5 in preparation, 15 peer-reviewed proceedings papers, 1 book under contract, 5 reviewed book chapters, 2 national task group reports, 37 reviewed abstracts and over 60 other abstracts.
- Filing of two international patents and one provisional patent.
- Invited seminar presentations that include public forums, international talks, national presentations and local presentations.
- Recipient of the 2002 Science and Engineering Award, Governors Certificate of Recognition, Commonwealth of Kentucky.
- Selected as one of 100 participants in the “4th Annual National Academies Keck Futures Initiative Conference on “Smart Prosthetics: Exploring Assistive Devices for the Body and Mind”.

TEACHING AND MENTORSHIP

Educational Curriculum

I have had several opportunities to contribute to the development of biomedical engineering educational programs. At University of Kentucky, I worked as a liaison between the Center for Biomedical Engineering, a graduate degree granting unit under the Graduate School, and the Department of Biosystems and Agriculture Engineering (BAE) in the College of Engineering for establishing a pre-biomedical engineering option for BAE undergraduates. Consequently, the graduate program started offering introductory courses for undergraduate engineering students. I also worked with the Electrical Engineering Department to establish and teach technical electives in biomedical engineering for their undergraduate students.

At Arizona State University, I was steering committee member of the NSF funded Interdisciplinary graduate education, research and training program on Neural & Musculoskeletal Adaptation in Form & Function. I also played a pivotal role in re-structuring the Bioengineering graduate curricular structure into a track-based system, developing the content, and teaching the core graduate courses for a the neural engineering track. In 2007, as a member of a select group of graduate faculty I helped implement a new University-wide graduate faculty model, where faculty from multiple departments/schools cluster to guide and manage graduate disciplinary degrees. In summer 2009, the Fulton School of Engineering, restructured from academic departments to a distributed school model to facilitate interaction across disciplines. Consequently, new teaching policies had to be developed. I

provided significant structure and language for the establishment of the new teaching policy. We are currently developing a new model for the undergraduate curriculum.

Classroom teaching and student mentorship

My teaching experience has included formal classroom teaching and research mentorship to graduate and undergraduate students in engineering, mathematics and life sciences. I have mentored 7 postdoctoral fellows (2 MD/PhD, 2 Neuroscientists, 3 Biomedical Engineers), served as primary research advisor to 8 students in biomedical engineering with graduate degrees (2 PhD, 7 MS) and served on the committees of another 18 graduates (5 PhD, 13 MS). Currently, 3 doctoral and 1 MS (thesis) students are under my direct tutelage and I serve on 9 PhD and 1 MS student committees. It is my belief that active participation in research by undergraduate students is likely to engender in them a greater enthusiasm for acquiring new knowledge thereby promoting both increased retention and life-long learning. Hence, over the years, I have directly mentored >50 undergraduate students (bioengineering, electrical engineering and life sciences). Graduate and undergraduate students under my mentorship have had opportunities to present their research and design work at international, national, and local scientific meetings and receive awards. All graduate students have published their research work. I have actively sought female and minority undergraduate students.

Some of the key aspects of my teaching experience are that I developed and taught new courses in Computational Neuroscience and Neurotrauma to Biomedical Engineering graduate students, co-developed "Introduction to Neural Engineering" graduate core courses for biomedical engineering, developed a new course in Neural Engineering for Seniors in Electrical Engineering with hands-on robotics component, taught courses with new material in Biomedical Control Systems and Biomedical Instrumentation for Seniors in Bioengineering.

RANU JUNG, PHD

ADDRESS

Arizona State University
PO Box 874404
Tempe, AZ 85287-4404
Telephone: 480-965-9052 (office); 602-327-7567 (mobile)
Fax: 480-727-7624
email: ranu.jung@asu.edu (work); ranu.jung@gmail.com (personal)
web: <http://ans.asu.edu>

EDUCATION

1993-1995 Postdoctoral fellow (NINDS), University of Maryland, College Park, MD, USA
Postdoctoral Mentor: Avis Cohen, PhD; Field of Study: Neuroscience

Jan. 1991 PhD, Case Western Reserve University, Cleveland, OH.
Advisor: Peter G. Katona, ScD; Field of Study: Biomedical Engineering
Thesis title: Ventral Medullary Organization for Cardio-Respiratory Control

May 1986 MS, Case Western Reserve University, Cleveland, OH.
Advisor: Peter G. Katona, ScD; Field of Study: Biomedical Engineering
Thesis title: Arterial Pressure and Respiratory Responses to Slow Ramp Carotid Sinus Pressures in the Dog.

April 1982 Bachelor of Technology with Distinction, National Institute of Technology, Warangal, Andhra Pradesh, India. Field of Study: Electronics and Communication Engineering

EXPERIENCE

ACADEMIC

Arizona State University, Tempe, AZ (2002-present)

2002-present Associate Professor (with tenure), Harrington Department of Bioengineering / School of Biological and Health Systems Engineering.
Co-Director, Center for Adaptive Neural Systems, ASU (Previously, Center for Rehabilitation Neuroscience and Rehabilitation Engineering in the Biodesign Institute; Reportable to Arizona Board of Regents, January 2008.

2005-present Affiliated Associate Professor, Department of Electrical Engineering / School of Electrical, Computer and Energy Engineering.

2008-present Member of Graduate Faculty of Mathematics, Bioengineering, Electrical Engineering and Neuroscience.

University of Kentucky, Lexington, KY (1995-2002)

2002-2004 Adjunct Associate Professor, Center for Biomedical Engineering

2001-2002 Associate Professor (with tenure), Center for Biomedical Engineering
Joint appointment in Dept. of Electrical and Computer Engineering
Joint appointment in Department of Physiology

2000-2002 Affiliated Faculty, Spinal Cord and Brain Injury Research Center

1997-2001 Assistant Professor, Center for Biomedical Engineering
Joint appointment in Department of Electrical Engineering
Joint appointment in Department of Physiology

1995-1997 Assistant Research Professor, Center for Biomedical Engineering
Joint appointment in Department of Physiology

University of Maryland, College Park, MD (1993-1995)

1993-1995 | Research Associate, Department of Zoology
NIH Individual National Research Service Award Fellow

Case Western Reserve University, Cleveland, OH (1985-1992)

1991-1992 | Research Associate and Technical Director Small-Animal Lab. Dept. of Medicine (Cardiology)
N.E. Ohio American Heart Association Research Fellow

1989-1990 | Research Assistant, Department of Medicine (Cardiology)

1983-1989 | Graduate Research Assistant, Department of Biomedical Engineering

1985-86,88 | Instructor, Integrated Human Biology (cardiovascular laboratory), School of Medicine

1985-1986 | Instructor, Undergraduate Biomedical Engineering Lab. (cardiovascular physiology), Department of Biomedical Engineering

INDUSTRIAL AND NON-PROFIT

2004-present | President and Co-founder, Advensys LLC, Scottsdale, AZ.

2006-2009 | President, Organization for Computational Neurosciences, Inc. 501(c)(3) with International Board and Executive Committee.

2002-present | Founding Board Member, Organization for Computational Neurosciences, Inc. 501(c)(3) with International Board and Executive Committee.

1988-1989 | Consultant, Gensia Pharmaceuticals Inc., San Diego, CA.

TRAINEE

1992 | Trainee in Computational Neuroscience, Marine Biological Laboratory, Woods Hole, MA.
NIH National Research Training Award Fellow (Summer)

1980 | Summer trainee, Instrument Techniques Private Limited, Hyderabad, AP, India.

HONORS and AWARDS (SELECTED)

2010	Appointed to the "Leadership Development Initiative" of the "Office for Developing Transformational Leaders", Arizona State University (1 of 13 faculty from 6 colleges) by University Provost.
2009	Appointed "Commissioner" to the <i>Biomedical Research Commission</i> , Office of Boards & Commissions, State of Arizona, Phoenix, AZ by Governor Jan Brewer with Senate approval.
2008	Appointed to <i>Technical Advisory Board</i> , Arkansas Science & Technology Authority, Little Rock, AR.
2007	Faculty Honoree, Ira A. Fulton School of Engineering 2006-2007. Arizona State University, Tempe, AZ.
2007	Invited to participate and prepare report on "Future Challenges for the Science and Engineering of Learning" by the US National Science Foundation, July 23-25, 2007, Washington, D.C. http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5567&org=OISE
2006	Elected "Senior Member"; Institute of Electrical and Electronics Engineers, Inc.
2006	Selected as one of 100 Participants in the 4th Annual National Academies Keck Futures Initiative Conference on "Smart Prosthetics: Exploring Assistive Devices for the Body and Mind".
2006	Elected, President of Organization for Computational Neurosciences, Inc.
2005	Invited Participant; Integrated Research Team meeting "NeuroProsthetics: Emerging Solutions for the Soldier and Society", U.S. Army Medical Research & Materiel Command's (USAMRMC) Telemedicine & Advanced Technology Research Center (TATRC), Oct 10-12, Marina del Rey, CA
2005	Invited Participant, DARPA Advanced Prostheses Workshop, January 10-11, 2005, Ellicott City, Maryland
2002	2002 Science and Engineering Award, Governor's Certificate of Recognition, Commonwealth of Kentucky
1998	Invited participant; Institute for Mathematics and its Applications: <i>Computational Neuroscience</i> ,

	University of Minnesota, Minnesota, MN.
1993- 1995	National Institutes of Neurological Disorders and Stroke Individual National Research Service Award
1992	National Institutes of Health; National Research Trainee Award for training in <i>Methods in Computational Neuroscience</i> , Marine Biological Laboratory, Woods Hole, MA 02543.
1991-1992	N.E. Ohio Research Fellow. American Heart Association
1988	Award for slide and poster presentation, Biomedical Engineering Research Day, Case Western Reserve University, Cleveland, Ohio.
1977-1982	Gandhi Memorial Centenary Merit Scholarship, Bhilai Steel Plant; Steel Authority of India, Ltd.
1981	Finalist; All India student seminar and paper contest in electronics, held at Dept. of Electronics Engineering, Osmania University, Hyderabad, India.

AWARDS to MENTORED STUDENTS

ARIZONA STATE UNIVERSITY

Graduate

2008	Brian K. Hillen, Travel award, Organization for Computational Neurosciences, Inc. USA
2007	Joe Graham, Travel award, Organization for Computational Neurosciences, Inc. USA
2006	Mallika Mukherjee, Wakonse-Arizona Fellowship; Arizona State University

Undergraduate

2010	Benjamin Speck, Fulton Undergraduate Research Initiative Award, Arizona State University Chad Andersen, Fulton Undergraduate Research Initiative Award, Arizona State University
2009	Peter Bremer, Fulton Undergraduate Research Initiative Award, Arizona State University Jared Bartell, ASU/NASA Space Grant, Arizona State University
2008	Robia Hendrix, ASU/NASA Space Grant, Arizona State University Jared Bartell, ASU/NASA Space Grant, Arizona State University
2007	Ashley Diamond, ASU/NASA Space Grant, Arizona State University
2006-2009	Danielle Protas, School of Life Sciences Undergraduate Research Fellow, Arizona State University

UNIVERSITY OF KENTUCKY

Graduate

2001	Anil Thota, Best Paper (2 nd prize), Rocky Mountain Bioengineering Symposium, Inc. USA
1999	Dan Li, Graduate Fellowship Award, 3 rd International Workshop on BioSignal Interpretation, Chicago, USA
1999	Sarvani Grandhe, President's Choice, Rocky Mountain Bioengineering Symposium, Inc. USA

Undergraduate

2002	Stefani Mulligan, Best Paper (2 nd prize), Rocky Mountain Bioengineering Symposium
1998	Casey McIntosh, Research Paper Award. Rocky Mountain Bioengineering Symposium
1997	Bradley Brewer, Research Paper Award. Southern Biomedical Engineering conference, <i>16th Southern Biomedical Engineering Conference</i> , Biloxi, MS. Bradley Brewer, Second place Award for Presentation. Southern Biomedical Engineering conference, <i>16th Southern Biomedical Engineering Conference</i> , Biloxi, MS.
1996	Casey McIntosh, Undergraduate Research and Creativity Award, University of Kentucky
1995	Bradley Brewer, Howard Hughes Medical Institute Undergraduate Research Fellowship, University of Kentucky

RESEARCH and TEACHING INTERESTS

Neural Engineering
 Computational Neuroscience
 Neurophysiological control of motor systems (Sensorimotor integration)
 Neurotrauma
 Dynamical Systems
 Signal Processing

PROFESSIONAL SOCIETY MEMBERSHIPS

1992-present	Senior Member (Elected 2006): Institute of Electrical and Electronics Engineers Inc (Only 7% of the approx. 380,000 members are elected to this rank) Student member(81-82); Member 1992, Senior Member 2006
1995-present	Senior Member: Society of Women Engineers
Since 1980's	Member: Biomedical Engineering Society
1991-present	Member: American Association for the Advancement of Science
~1990-present	Society for Neuroscience
~2004-present	International Functional Electrical Stimulation Society
~2000-present	National Neurotrauma Society

GRANTS & CONTRACTS

Successfully formed multi-institution partnerships between academia, industry and clinical units; led teams of multi-disciplinary investigators; secured extramural funding for infrastructure development (instrumentation and education) in addition to research projects. \$ indicate direct plus indirect costs

Breakdown for Active and Completed grants:

Total as sole PI: \$9,491,125
Total (as sole PI, Co-PI, Co-I or participant): \$17,660,648

ARIZONA STATE UNIVERSITY (August 2002-present)

Active

09/30/07-06/30/12	<p>NIH:RO1EB008578 (PI: Ranu Jung) \$3,366,360</p> <p><i>"Neural-Enabled Prostheses with Sensorimotor Integration"</i></p> <p>National Institutes of Biomedical Imaging and Bioengineering & National Institutes of Child Health and Development (Bioengineering Research Partnership Program)</p> <p>ASU Co-Investigators: School of Biological & Health Systems Engineering School of Electrical, Computer & Energy Eng. Department of Kinesiology</p> <p>External partners: Mayo Clinic Arizona, AZ Cochlear Ltd., Australia Motion Control, Inc., UT Artificial Limb Specialists, AZ</p> <p>The goal of this academic-clinical-industrial partnership is to develop a system that will interface a prosthetic hand with peripheral nerves of upper limb hand amputees using fully implanted wireless communication to provide sensory feedback to the user. One patent filed.</p>
-------------------	--

09/01/09-08/31/12	<p>NSF: IIS0943753 (PI: Ranu Jung) \$47,997</p> <p><i>"Knowledge Transfer in Computational Neuroscience"</i></p> <p>National Science Foundation (Division of Information & Intelligent Systems)</p> <p>The proposal requests support for invited lecturers to run tutorials and workshops, for a Frontiers in Computational Neuroscience Lecture and for postdoctoral fellows and students to present at the Annual International Computational Neuroscience Meetings.</p>
08/15/05-05/31/10	<p>NIH: R01NS054282 (PI: Ranu Jung) \$1,314,799</p> <p><i>"Modeling Neuromusculoskeletal Alterations after Spinal Cord Injury"</i></p> <p>National Institutes of Neurological Disorders & Stroke (Collaborative Research in Computational Neuroscience – Joint NSF-NIH Program)</p> <p>ASU Co-Investigators: School of Biological & Health Systems Engineering PRISM</p> <p>External partners: Barrow Neurological Institute (Neuroscience), AZ University of Michigan (Mathematics), MI E^xponent Inc (Biomechanics), AZ</p> <p>The goal of this computational and experimental neuroscience collaborative research proposal is to develop neuromusculoskeletal models based on electrophysiology of spinal neurons, spinal reflexes and musculoskeletal properties in rodents with incomplete spinal contusion injury.</p>
07/07/09-06/31/10	<p>NIH: R13NS066633 (PI: Ranu Jung) \$25,000</p> <p><i>"CNS*2009"</i></p> <p>National Institutes of Neurological Disorders & Stroke & National Institutes of Biomedical Imaging and Bioengineering (Conference Grant Proposal)</p> <p>This grant provided awards for students, postdoctoral fellows and travel expenses for invited speakers to attend the 18th Annual Computational Neuroscience Conference in Berlin, Germany</p>
07/01/05-04/30/10	<p>NIH: R01HD049773 (PI: James Abbas) \$868,573</p> <p><i>"Adaptive Electrical Stimulation for Locomotor Retraining"</i></p> <p>National Center for Medical Rehabilitation Research</p> <p>ASU Co-Investigator: Ranu Jung, PhD School of Biological & Health Systems Engineering</p> <p>The goal of this bioengineering research grant is development of adaptive controllers for use in neuroprostheses for people with incomplete paraplegia.</p>

Completed

07/01/08-12/31/09	<p>SfAZ: CAA0282-08 (PI: Ranu Jung) \$274,000</p> <p><i>"Promoting Plasticity after Spinal Cord Injury using Neuromuscular Stimulation"</i></p> <p>Science Foundation Arizona (Competitive Advantage Program)</p> <p>The goal of this project is to obtain preliminary data for assessing the ability of neuromuscular electrical stimulation based movement therapy to promote motor recovery in rodents with incomplete spinal cord injury.</p>
06/01/05-05/31/09	<p>NIH: S10RR019945 (PI: Ranu Jung) \$1,309,550</p> <p><i>"7T/30 Bruker BioSpec Magnetic Resonance Imaging/Spectroscopy System (Previously: PharmaScan 70/16 In-Vivo Spectroscopy/Imaging System)"</i></p> <p>National Center for Research Resources (High-End Instrumentation Grant Program)</p>

This proposal provided funds for a small-animal magnetic resonance imaging and spectroscopy system that is a unique Phoenix valley-wide research resource. The funding was pivotal in the establishment of a Barrow Neurological Institute-Arizona State University joint pre-clinical imaging center.

08/15/07-01/31/09	<p>NSF: SBE-0518697 Supplement (PI: Ranu Jung) \$22,174</p> <p><i>Catalyst- Minisymposium and Workshop on "Co-Adaptive Learning: Technology for the Aged"</i> National Science Foundation (Science of Learning Centers- Catalyst, planning grant program) ASU Co-Investigators: Multiple faculty from Bioengineering, Electrical Engineering, Chemical Engineering, Kinesiology, Mathematics, Computer Science, Biodesign Institute The grant allowed hosting of an annual symposium and workshop development (third in series; see next item).</p>
08/15/05-01/31/09	<p>NSF: SBE-0518697 (PI: Ranu Jung) \$110,944</p> <p><i>"Catalyst- Center of Excellence for Adaptive Neuro-Biomechatronic Systems (CEANS)"</i> National Science Foundation (Science of Learning Centers- Catalyst, planning grant program) The grant allowed development of a plan for a Science of Learning (SLC) center to investigate the interactions between adaptive engineered and adaptive biological systems. The work included hosting of two mini-symposia and workshops (Mar. 2007:"Adaptation and Learning in Neurobiomechatronic Systems" and Feb. 2008:"Promoting Plasticity") with expert national and international speakers that included a member of the National Academy of Engineering. A call for SLCs has not been made by the NSF since this award was given. (Brief descriptions available at http://ans.asu.edu/events/symposia.php)</p>
04/01/05-03/31/08	<p>NIH: R21 EB003629-A1 (PI: Ranu Jung) \$403,756</p> <p><i>"Active MEMS Neural Clamps"</i> National Institutes of Biomedical Imaging and Bioengineering The grant led to the design of novel neural clamps using MEMS for recording ventral root activity. (Patent filed)</p>
09/28/05-09/27/07	<p>ARMY: W911NF-05-C-0122/STTR (PI: Ranu Jung) \$750,000</p> <p><i>"Neuromorphic Control of Powered Limb Splints (Phase II)"</i> ARMY- Phase II STTR to Advensys, LLC The grant led to the implementation of a neuromorphic controller for powered limb splints for evacuating soldiers (competitive extension of Phase I).</p>
01/17/02-06/30/06	<p>NIH: R01HD40335 (PI: Ranu Jung) \$775,418</p> <p><i>"A Rodent Model for Locomotor Training with FNS"</i> National Institutes of Child Health and Development The grant led to the development of a new rodent model to complement the human subject technology development of functional neuromuscular electrical stimulation for movement control after paraplegia. Awarded while at University of Kentucky; Transferred to Arizona State University where all work was performed.</p>
08/01/04-01/31/05	<p>ARMY: W911NF-04-L-0071/STTR (PI: Ranu Jung) \$99,949</p> <p><i>"Neuromorphic Control of Powered Limb Splints (Phase I)"</i> ARMY- Phase II STTR to Advensys, LLC</p>

The grant led to preliminary implementation of a neuromorphic controller for powered limb splints for evacuating soldiers. Unsolicited ARMY call referenced my prior published work from NIH:R21-RR12588. Phase II awarded based on successful completion.

	BNI (PIs: Ranu Jung & Thomas Hamm (BNI))	\$19,600
06/01/03-09/01/05	<i>"Effects of Incomplete Spinal Injury on Reflex and Motoneuron Properties"</i> Barrows Neurological Institute (St. Josephs Hospital) (Harrington Dept. of Bioengineering-Whitaker Foundation Funded Seed Grant program) Data from this project was used for competing for the current grant R01NS054282 through the "Collaborative Research in Computational Neuroscience" NSF-NIH joint program.	

	ASU (Co-PIs: Huey, Willis, Jung)	\$18,000
01/01/03-12/31/03	<i>"Contractile and Metabolic Adaptations of Skeletal Muscle to Spinal Cord Injury & Rehabilitation"</i> ASU- School of Life Sciences Multi-Investigator Proposal Development Grant Program	

Education and Training Programs

Completed

2002-2006	Participant in IGERT, LSAMP and Whitaker Foundation awards (5 awards)	\$6,826,933
-----------	---	-------------

Funding as Mentor on Graduate and Undergraduate Awards and Fellowships

2003-2009	Awards from Science Foundation Arizona, NSF-IGERT, Dean's Graduate fellowships, ASU/NASA Space grant internships, Barrett Honors College (9 awards)	~\$86,900
-----------	---	-----------

UNIVERSITY OF KENTUCKY (August 1995-July 2002)

Completed

1997-2002	Multiple grants as PI from: National Science Foundation, National Institutes of Health, Kentucky Spinal Cord and Head Injury Research Trust, Kentucky Science and Engineering Foundation, The Whitaker Foundation, State of Kentucky and University of Kentucky.	Total 11 awards \$1,333,095
-----------	--	--------------------------------

Funding as Mentor on Graduate and Undergraduate Awards and Fellowships

1995-1997	"Undergraduate Research and Creativity Grant & "Howard Hughes Medical Institute Undergraduate Research Fellowship" (2 awards)	\$1,350
-----------	---	---------

OTHER INSTITUTIONS (January 1991-July 1995)

Completed

	NIH:F32NS09462 (PI: Ranu Jung)	\$58,500
08/93-07/95	<i>"Sensorimotor Integration in the Lamprey"</i> National Institutes of Neurological Disorders and Stroke (Individual National Research Service Award for Postdoctoral Fellows) Mentor: A.H. Cohen, PhD (University of Maryland, Zoology)	

	Pilot Projects in Neurobiology (PI: Ranu Jung)	\$4,000
1991	<i>"Caudal Ventrolateral Medulla and Ventilation in the Rat"</i> University Sleep Center, University Hospitals, Cleveland, Ohio	

01/91-06/92	Research Grant (PI: Ranu Jung) <i>"Baro- and Chemoreflexes in Heart Failure"</i> American Heart Association (N.E. Ohio Affiliate- with Competitive Renewal) Mentor: M.D. Thames, M.D. (Cardiology)	\$30,000
08/92	Trainee Award (PI: Ranu Jung) <i>"Methods in Computational Neuroscience Course, Marine Biological Lab., Woods Hole, MA"</i> National Institutes of Health. National Research Trainee Award Directors: J. Bower, C. Koch (CalTech)	

PUBLICATIONS

- Students who worked in my research program are designated as follows: postdoctoral = 2X underline; graduate students = 1X underline; undergraduate student = 1X dashed underline)
- Students were given the first authorship (with me listed as last/senior author) if they carried out the experiment and wrote the manuscript under my supervision.

Refereed Journal Articles

1. **Jung R, A Belanger, T Kanchiku, M Fairchild, and JJ Abbas.** Neuromuscular stimulation therapy after incomplete spinal cord injury promotes interlimb coordination during locomotion. *Journal of Neural Engineering*, 2009, 055010 (14pp) ([doi:10.1088/1741-2560/6/5/055010](https://doi.org/10.1088/1741-2560/6/5/055010))
2. **Jung R, K Ichihara, G Venkatasubramanian and JJ Abbas.** Chronic neuromuscular electrical stimulation of paralyzed hindlimbs in a rodent model. *Journal of Neuroscience Methods*, 183:241-254, 2009 ([doi:10.1016/j.jneumeth.2009.06.043](https://doi.org/10.1016/j.jneumeth.2009.06.043)).
3. **Kim S-J, M Fairchild, A larkov, JJ Abbas and R Jung.** Adaptive control of movement for neuromuscular stimulation-assisted therapy in a rodent model. *IEEE Transactions on Biomedical Engineering*, 56(2):452-461, 2009.
4. **Ichihara K, G Venkatasubramanian, JJ Abbas and R Jung.** Neuromuscular electrical stimulation of the hindlimb muscles for movement therapy in a rodent model. *Journal of Neuroscience Methods*, 176:213-224, 2009 ([doi:10.1016/j.jneumeth.2008.09.015](https://doi.org/10.1016/j.jneumeth.2008.09.015))
5. **+Lynskey JV, +A Bellanger and R Jung.** Activity dependent plasticity in spinal cord injury. *Journal of Rehabilitation Research and Development*, 45(2): 229-240, 2008 (Invited review; +These authors contributed equally)
6. **+Kanchiku T, +JV Lynskey, D Protas, JJ Abbas and R Jung.** Neuromuscular electrical stimulation induced forelimb movement in a rodent model. *Journal of Neuroscience Methods*, 167(2):317-26, 2008, [doi:10.1016/j.jneumeth.2007.08.002](https://doi.org/10.1016/j.jneumeth.2007.08.002) (+ These authors contributed equally)
7. **Thota A, S Carlson-Watson, E.J. Knapp, BT Thompson, and R Jung.** Neuromechanical control of locomotion in the rat. *Journal of Neurotrauma*, 22(4): 442-465, 2005.
8. **Graham J, V Booth and R Jung.** Modeling motoneurons after spinal cord injury: Persistent inward currents and plateau potentials. *Neurocomputing*, 65-66, 719-726, 2005.
9. **Wang H and R Jung.** Variability analyses suggest that supraspino-spinal interactions provide dynamic stability in motor control. *Brain Research*, 930(1-2):83-100, 2002. (Cover vol. 933(2), April 2002)
10. **Li D and R Jung.** Tracking rhythmicity in nonstationary quasiperiodic biomedical signals using adaptive time varying covariance. *Computers in Biology and Medicine*, 32(4):261-282, 2002.
11. **Mulligan SJ, B Thompson, E Knapp, and R Jung.** A method for assessing balance control in rodents. *Biomedical Science Instrumentation*, 38:77-82, 2002.
12. **Jung R, EJ Brauer, and JJ Abbas.** Real-time interaction between a neuromorphic electronic circuit

and the spinal cord. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, 9(3):319-326, 2001.

13. Grandhe S and **R Jung**. Presence of brain-spinal cord interactions alters lamprey locomotor response to periodic perturbation. *Neurocomputing*, 38-40:1249-1259, 2001.
14. Thota AK, S Carlson and **R Jung**. Recovery of locomotor function after treadmill training of incomplete spinal cord injured rats. *Biomedical Science Instrumentation*, 37:63-68, 2001.
15. Li D and **R Jung**. Quantifying co-evolution of nonstationary biomedical signals using time varying phase spectra. *Annals of Biomedical Engineering*, 28:1101-1115, 2000.
16. **Jung R** and M Shao. Robustness of coarse graining spectral analysis in estimating frequency and Hurst exponent from mixed time series with harmonic and fractal components. *Neurocomputing*, 32-33, 1055-1063, 2000.
17. Li D, DSK. Magnuson, and **R Jung**. Non-stationary analysis of extracellular neural activity. *Neurocomputing*, 32-33, 1083-1093, 2000.
18. Grandhe S, JJ Abbas, and **R Jung**. Brain-spinal cord interactions stabilize the locomotor rhythm to an external perturbation *Biomedical Science Instrumentation*, 35: 175-180, 1999.
19. **Jung R**, JT Buchanan, and D Li. Brain-spinal cord feedforward-feedback interactions affect output pattern and intracellular properties of motor networks in the lamprey. *Neurocomputing*, 26-27:749-759, 1999.
20. **Jung R.**, J Jung, and B Losch. Increased variability in motor output with brain-spinal cord interaction. *Biomedical Science Instrumentation*, 34:107-112, 1998.
21. McIntosh CM, CF Knapp, and **R Jung**. Design of a closed system swim mill for lamprey swimming analysis, *Biomedical Science Instrumentation*, 34: 87-92, 1998.
22. **Jung R**, T Kiemel, and AH Cohen. Dynamic behavior of a neural network model of locomotor control in the lamprey. *Journal of Neurophysiology*, 75(3):1074-1086, 1996.
23. Cohen AH, L Guan, J Harris, **R Jung**, and T Kiemel. Interaction between the caudal brainstem and the lamprey central pattern generator for locomotion. *Neuroscience*, 74(4):1161-1173, 1996.
24. **Jung R**, ME Dibner-Dunlap, MA Gilles and MD Thames. Cardiorespiratory reflex control in rats with left ventricular dysfunction. *American Journal of Physiology (Heart and Circulation)*, 268 (1 pt 2): H218-225, 1995.
25. **Jung R**, EN Bruce, and PG Katona. Cardiorespiratory responses to glutamatergic antagonists in the caudal ventrolateral medulla of rats. *Brain Research*, 564:286-295, 1991.
26. **Jung R** and PG Katona. Cardiovascular and respiratory responses to slow ramp carotid sinus pressures in the dog. *Journal of Applied Physiology*, 68(4):1465-1474, 1990.
27. **Jung R**, EN Bruce, and PG Katona. Tonic and baroreflex effects on arterial pressure and ventilation of pentobarbital and nicotine on the rat ventral medullary surface. *Brain Research*, 485:399-402, 1989.
28. Fairchild, M, SJ Kim, JL Burton, A larkov, JJ Abbas, **R Jung**. Repetitive hindlimb movement using intermittent adaptive neuromuscular electrical stimulation in an incomplete spinal injury rodent model. *Experimental Neurology* (Minor revisions)
29. Kurian M, S Crook and **R Jung**. Motoneuron model of self-sustained firing after spinal cord injury, *Journal of Computational Neuroscience* (In revision).
30. Venugopal S, T Hamm, S Crook, **R Jung**. Recurrent inhibitory control of alpha motoneuron excitability after spinal cord injury – insights from a computational model (Working Title). To be submitted.
31. Fairchild M, A larkov, A Diamond, J Bartell, **R Jung**. AlexaFluor conjugates of cholera toxin

**Journal
articles in
revision or
under review**

**Journal
articles in
preparation**

subunit B reveal changes in soma morphology of multiple lumbar motoneuron populations after thoracic spinal injury in rodents (Working Title). To be submitted.

32. Hamm TM, VV Turkin, N Bandekar, D O'Neill, and **R Jung**. Discharge characteristics and intrinsic currents of rat hindlimb motoneurons recorded in situ (Working Title). To be submitted.
33. Graham J, S Venugopal, **R Jung**. Rodent motoneuron morphology changes with spinal cord injury examined *in silico* (Working Title). To be submitted.
34. Hillen BK, JJ Abbas, D Jindrich, **R Jung**. Effects of muscle strength and activation profile on foot drag after spinal cord injury: a computational study. (Working Title). To be submitted.

Patents Filed

- | | |
|------|---|
| 2009 | 1. April 21, 2009. US provisional patent, M9-109L, "Neural Enabled Prosthesis-Communication Interface for Sensory Stimulation (NEP-CSS)". Ranu Jung , Kenneth Horch, James J. Abbas, Stephen Phillips, Bertan Bakkaloglu, Seung-Jae Kim. |
| 2008 | 2. Nov, 11, 2008. PCT/US2008/083965, "Neuromorphic Controlled Powered Orthotic and Prosthetic Systems", Advensys LLC, Ranu Jung , Shah Vikram Jung, Brundavani Srimattirumalaparle. |
| 2008 | 3. July, 2008; PCT/US2008/070683. "Self-Anchoring MEMS Intrafascicular Neural Electrode". Ranu Jung , Stephen Phillips, James Abbas. |

Invention disclosures

- | | |
|------|--|
| 2009 | 1. April 6, 2009. AzTE Case #M9-109L, "Neural Enabled Prosthesis-Communication Interface for Sensory Stimulation (NEP-CSS)". Ranu Jung , Kenneth Horch, James J. Abbas, Stephen Phillips, Bertan Bakkaloglu, Seung-Jae Kim. |
| 2006 | 2. June 5, 2006. ASU Case # M6-139, "Intrafascicular Active MEMS Neural Clamp", Ranu Jung , Stephen Phillips, James Abbas. |
| 2005 | 3. December 21, 2005. ASU Case# M6-059, "Active MEMS Neural Clamp". Stephen Phillips, Ranu Jung , Monir Khan |

Selected Refereed Proceedings Papers (Total 15)

1. Abbas JJ, S-J Kim, M Fairchild, S Allison, N Krishnamurthi, and **R Jung**. On the Use of Adaptive Control in Stimulation-Assisted Neuromotor Therapy. *Proceedings of the 13th Annual Conference of the International Functional Electrical Stimulation Society*, 21st-25th September, 2008, Freiburg, Germany.
2. **Jung R**, A Belanger, T Kanchiku, J Lynskey, M Mukherjee, D Hagner, JJ Abbas. Hindlimb Neuromuscular Stimulation Therapy after Thoracic Contusion Injury Promotes Locomotor Recovery. (Online: www.ifess.org; ISBN 4-9980783-1-3), pg. 118-120, *Proceedings of the 11th Annual Conference of the International Functional Electrical Stimulation Society*, 12th-15th September, 2006, Miyagi-Zao, Japan (Talk by R. Jung).
3. **Jung R** and H Wang. Variability in Motor Control: Supraspino-Spinal Interactions underlie Fractal Locomotor Rhythms. *Proceedings of the 25th Annual International IEEE EMBS Conference*, EMBC 2003, pg. 3826-3829; Sept 17-21, 2003, Cancun, Mexico (Talk by R Jung)
4. **Jung R**, E. Brauer, JJ Abbas, and S Grandhe. Analog VLSI-Spinal Cord Interface for Motor Control. *Proceedings of the First Joint EMBS-BMES conference*, pg. 488, Oct 13-16, 1999, Atlanta, GA, USA
5. Li D and **R Jung**. Time-varying analysis of rhythmic neurological signals. *Proceedings of the 3rd International Workshop on Biosignal Interpretation*, pg.226-229, June 12-14, 1999, Chicago, USA. (Paper also published in *Methods of Information in Medicine*, 39(2):99-203, 2000.) (Student D. Li won an award for the paper).

6. Brewer B and **R Jung**. Sensitivity analysis of a hybrid neural network for locomotor control in the lamprey. *Proceedings of the 16th Southern Biomedical Engineering Conference*, pg. 353-356, 1997, Biloxi, MS, (Poster presentation by B. Brewer. The paper won an award. The student received an additional award for the presentation).

Book

Biohybrid Systems (Working title); Editor: **R Jung**. Under contract by John Wiley & Sons, Inc. (Expected publication 2010).

**Selected
Refereed Book
Chapters
(Total 5)**

1. Venkatasubramanian G, **R Jung**, JD Sweeney. "Functional Electrical Stimulation", In: *The Wiley Encyclopedia of Medical Devices and Instrumentation*, 2nd Edition, Editor. J. G. Webster, Wiley, March 2006. ISBN: 0-471-26358-3; Pages: 347-366
This didactic book chapter is extensively based on a chapter in Venkatasubramanina's Master's thesis.
2. **Jung R**. The fractal nature of the locomotor rhythm may be due to interactions between the brain and the spinal pattern generator. Invited Commentary on Chapter 4.7 (Fractal analysis of human walking rhythm). In: *Biomechanics and Neural Control of Movement*. Eds. J.M. Winter and P.E. Crago, Springer-Verlag, pp 263-264, 2000.
3. **Jung R**. and S Generazzo. Response to perturbations of a neural network model of locomotor control in the lamprey. In: *Computational Neuroscience:Trends In Research* Ed. James Bower, Plenum Publishing, New York, pp. 415-421, 1998.

**Invited
National Task
Group Reports**

1. **Jung R** "Adaptive Learning Technology" in National Science Foundation Final Workshop Report: Future Challenges for the Science and Engineering of Learning July 23-25, 2007. pg. 33-34
<http://www.nsf.gov/sbe/SLCWorkshopReportJan08.pdf>
2. **Jung R**. National Academies Keck Futures Initiative: Smart Prosthetics: Exploring Assistive Devices for the Body and Mind: Task Group Summaries, The National Academies Press. 2007, .ISBN-10: 0-309-10466-1 (Contributing task group member [Create Hybrid Prostheses That Exploit Activity-Dependent Processes](#), pp77-86)

**Selected
Refereed
Abstracts in
Conference
Proceedings
(Total 37)**

1. Venugopal S, S Crook, M Kurian, **R Jung**. Role of inhibition in the suppression of α -motoneuron hyper-excitability following chronic spinal cord injury. *BMC Neuroscience* 10 (suppl 1): P343, 2009. doi:10.1186/1471-2202-10-S1-P343 (Poster at the 18th Annual Computational Neuroscience Meeting, July 17th-23rd, 2009, Berlin, Germany).
2. Hillen BK, JJ Abbas, D Jindrich, **R Jung**. Effects of muscle strength and activation profile on foot drag in a simulated SCI rat; *BMC Neuroscience* 9 (suppl 1): P27, 2008 (Poster at 17th Annual Computational Neuroscience Meeting, July 19th-24th, 2008, Portland, Oregon, 2008; Travel award to BK Hillen)
3. **Jung R**. Adaptive Neurotechnology to Make Neural Circuits Functional.
<http://meetings.aps.org/link/BAPS.2008.MAR.Y36.7> Online. American Physical Society, March Meeting, March 10-14, 2008. New Orleans, LA. (**Invited Keynote Lecture**).
4. Graham JW and **R Jung**. Modeling morphological changes in spinal motoneurons following spinal cord injury to explore changes in electrical behavior. *BMC Neuroscience* 8 (suppl 2): P27, 2007 (Poster at the 16th Annual Computational Neuroscience Meeting, July 7th-12th, 2007, Toronto Canada, 2007).

**Other
Abstracts
(Total 68, 25 in
last three
years)**

MEDIA EXPOSURE (Selected)

2009	International Neuroinformatics Coordinating Facility, Sweden, Newsletter, October 2009, "Neuroinformatics Profile- A conversation with the outgoing OCNS President, Ranu Jung" http://www.incf.org/ ; http://www.incf.org/about/news/newsletters/incf-newsletter-2009-issue3.pdf
2009	Irish Times, August 2009, "New Hope for Victims of Spinal Cord Injury" http://www.irishtimes.com/newspaper/health/2009/0804/1224251958684.html
2009	ASU research magazine (Stories of Scholarship and Creative activity), March 2009, "Stimulated to Heal", http://researchmag.asu.edu/2009/03/Stimulated_to_heal.html
2008	Neurotech business report, vol. 8, No. 3, March 2008. "Adaptive Control Methods Transform Neuroprosthetics", http://www.neurotechreports.com/
2007	Arizona Bioscientist (blog). July 30, 2007; "Ranu Jung and the 16th Annual International Computational Neuroscience meeting" http://azbioscientist.blogspot.com/2007/07/ranu-jung-and-16th-annual-international.html
2006	National Institute of Biomedical Imaging and Bioengineering - E-Advance; April 28, 2006; "Tiny Neural Clamps Make Connections" http://www.nibib.nih.gov/publicPage.cfm?pageID=4510
2006	Arizona Republic Feb 9, 2006; Pair Look to Reboot the Brain http://www.azcentral.com/arizonarepublic/business/articles/0209innovator09.html
2006	Flinn Foundation, Jan 23, 2006; Meet the Players-Two Family.... http://www.flinn.org/bio/article.cms/itemid=b_mtp_jung_kinetic
2005	NCCR, July 12, 2005; "High End Instrumentation Grants" http://www.nih.gov/news/pr/jul2005/ncrr-12.htm
2002	TV coverage, Channel 36, Lexington KY; "Neural interfaces with the spinal cord"

PRESENTATIONS (Selected)

PUBLIC FORUMS: KEYNOTE LECTURES, PODCASTS, DISCUSSION PANELS (TOTAL 12)

2008	"2008 Neurotech Leaders Forum: Technology Transfer Panel", San Francisco, CA. (Invited Speaker)
2008	"Strategies for Success Podcasts: Routines, Habits and Tactics", http://graduate.asu.edu/sfs/Podcasts.html , Podcast for Graduate College, Arizona State University, Tempe, AZ.
2007	"Adaptive Technologies for the Central Nervous System: Are We Changing What it means to be Human?" Public discussion in "Science Café" at Arizona Science Center, Phoenix, AZ.
2007	"Rehabilitation Engineering- Adaptive Neural Systems", Lecture at the Technology-Enhanced Lifestyles- Signature Research Breakfast Forum. Sponsored by Ira A. Fulton School of Engineering, ASU & City of Tempe; Tempe, 2007, AZ
2005	"Bioengineering", Lecture at the Arizona Bio-EXPO 2005, Phoenix, AZ.

INTERNATIONAL (NON-US) UNIVERSITIES: INVITED SEMINARS

2009	"Adaptive Biomimetic Technology to Promote Neural Adaptation", Biomedical Distinguished Lecture Series, University of Galway, Galway, Ireland, 24 July, 2009.
2008	"Promoting Neuroplasticity", National Brain Research Center, Manesar, Gurgaon, Haryana, India, December 18, 2008.
2007	"Making Neural Circuits Functional". The Nobel Institute for Neurophysiology, Department of Neuroscience, Karolinska Institute, Stockholm, Sweden, June 15, 2007.
2006	"Designing Adaptive Engineered Systems To Promote Adaptation in Neural Systems", Department of Orthopedic Surgery, Yamaguchi University, Hofu, Japan. September 16 th , 2006.
2000	"Strategies for locomotor control: Lessons from a lower vertebrate", University of Twente, Dept. of

Electrical Engineering, Enschede, The Netherlands, July 21. 2000

INTERNATIONAL CONFERENCES & WORKSHOPS: INVITED LECTURES (TOTAL 8)

- 2008 *"Pervasive Health Monitoring for Adaptive Neurotechnology"*, International Congress on Pervasive Computing and Management, Delhi, India, December 14, 2008. **Keynote Lecture**
- 2008 *"Neurotechnology for Making Neural Circuits Functional"* Twelfth International Conference on Cognitive and Neural Systems (12th ICCNS), Boston University, Boston, MA, May 14–17, 2008. **Keynote Lecture**
- 2008 *"Adaptive Neurotechnology for Making Neural Circuits Functional"*, 2008 American Physical Society Annual March Meeting, New Orleans, LA, March 14, 2008. **Keynote Lecture**
- 2007 *"Neuromorphic Engineering: Cognitive and Behaving Systems- Applications"*. 2007 Neuromorphic Spring Meeting, Porto Conte Ricerche, April 13-15, 2007, Tramarglio, Italy.
- 2005 *"Making Spinal Circuits Functional: Influence of the brain and periphery in the control of locomotion"*, The Institute of Neuroinformatics ETH-Zurich and The Institute of Neuromorphic Engineering, Univ. Maryland joint workshop on "Processing and Generation of Temporal Signals in Neural and Neuromorphic Systems", August 22-24, 2005, Zurich, Switzerland.

NATIONAL (US) UNIVERSITIES: INVITED SEMINARS (TOTAL 17)

- 2007 *"Synergistic Learning: Adaptive Neurotechnology for Promoting Neuroplasticity"*, University of Utah, November 30, 2007.
- 2007 *"Making Neural Circuits Functional"*. Center for Neural Computation and Neural Engineering Seminar Series, University of Chicago, March 13, 2007.
- 2003 *"Brain-Spinal Cord Interactions in the Control of Locomotion: Lessons from a Lower Vertebrate"*, Case Western Reserve University, NSF IGERT invited speaker, Cleveland, OH, Mar. 3, 2003.
- 1995 *"Modeling and Experimental Investigations of Brainstem Control in Locomotion"*, Dept. of Biology, University of North Carolina, Charlotte, NC. April 1995.
- 1981 *"Medical Instrumentation"*, Dept. of Electronics Engineering "All India student seminar and paper contest in electronics", Osmania University, Hyderabad, India, 1981.

NATIONAL (US) CONFERENCES & WORKSHOPS: INVITED PRESENTATIONS AND PARTICIPATION IN DISCUSSION PANELS (TOTAL 8)

- 2007 *"Co-Adaptive (Synergistic) Learning"*, position statement presentation at the "Future Challenges in Science and Engineering of Learning" workshop, Directorate for Social, Behavioral & Economic Sciences, National Science Foundation, Washington DC, July 23-25, 2007 (Oral presentation)
- 2006 *"Interfacing with the nervous system for neuromotor control"*, 4th Annual National Academies Keck Futures Initiative Conference on "Smart Prosthetics: Exploring Assistive Devices for the Body and Mind"; November 9-12, 2006, Irvine, CA. (Poster presentation)
- 2005 *"Neuromorphic Control of Movement"*, Army Research Office Biosciences Workshop "Bugging Bugs and Brains: Internal Communications and Applications from Cellular Internals to Mental Contents." May 22-25, 2005. Cashiers, NC (Oral presentation)
- 2005 Invited Participant Integrated Research Team meeting "NeuroProsthetics: Emerging Solutions for the Soldier and Society", U.S. Army Medical Research & Materiel Command's (USAMRMC) Telemedicine & Advanced Technology Research Center (TATRC), Oct 10-12, 2005, Marina del Rey, CA (Discussion Panel)
- 2005 Invited Participant, DARPA Advanced Prostheses Workshop, January 10-11, 2005, Ellicott City, Maryland (Discussion)

LOCAL TALKS (WITHIN UNIVERSITY OR AT LOCAL INSTITUTIONS) (TOTAL 17)

- 2008 *"Neurotechnology for Making Neural Circuits Functional"*, 2nd Annual Arizona State University-Barrow Neurological Institute Neuroscience Symposium, Tempe, AZ, February 16, 2008 (Invited Talk)
- 2006 *"Preclinical Bioimaging and Spectroscopy at Arizona State University"*, Arizona Bioscience Leadership Symposium: Building Collaborations, Sponsors: The Arizona Biomedical Research Commission & The Flinn Foundation, June 12-13, 2006, Phoenix, AZ. (Bioimaging Research

	Platform Presentation)
2003	“Motor Plasticity after Spinal Neurotrauma: Neuromotor Assessment”, Arizona State University, NSF IGERT on Neural and Musculoskeletal Adaptation in Form and Function, Tempe, AZ, April 17, 2003. (Seminar)
2002	“Rehabilitation Neuroscience and Rehabilitation Engineering”, Mayo/ASU Joint Research Forum, Scottsdale, AZ, Dec. 7, 2002. (Seminar and Poster)

SERVICE to the PROFESSION

INTERNATIONAL GOVERNMENTAL AND UNIVERSITY COMMITTEES

2004	Fondation canadienne pour l'innovation, Canada; Reviewer for New Opportunities Fund.
2006-2008	Member, Expert Assessment Committee for Appointments and Promotions; Department of Health Science and Technology, Aalborg University, DK.
2007	Opponent, Doctoral defense (Mikael Huss), Royal Institute of Technology, Stockholm, Sweden

INTERNATIONAL NON-PROFIT ORGANIZATIONS

2006-2009	President (Elected) of Executive Committee and international Board. Organization for Computational Neurosciences, Inc. USA (501c(3)) Established distributed governance and responsibility model Enhanced presence of organization through re-designed web page and membership in NeuroNetworks Established structure for soliciting proposals for hosting annual international meetings Successfully solicited private sponsorship and federal grant funding for annual meetings Worked closely with local organizing teams for hosting the annual meetings in 2007 (Toronto, Canada), 2008 (Portland, USA), 2009 (Berlin, Germany), 2010 (San Antonio, USA)
1997-present	Member, Board of Directors, Rocky Mountain Bioengineering Symposium, Inc.
2003-2006	Member Founding Board of Directors, Organization for Computational Neuroscience, Inc.

NATIONAL (US) GOVERNMENTAL COMMITTEES

National Institutes of Health (selected; Reviewer since 2000)

2009-present	Member (Appointed-3 Year term), Sensorimotor Integration (SMI) Study Section (3 panels/yr)
2004-2006	Member (Appointed-3 Year term), Respiratory Integrative Biology and Translational Research (RIBT) Study Section (3 panels/yr)
2002-2003	Member (Appointed), Respiratory Physiology Study Section
10/08	Site reviewer, Special Emphasis Panel- ZRG1-SBIB-C (40) P, University of California San Diego, National Biomedical Computation Resource, San Diego, CA
05/08	Panel member, Special Emphasis Panel- ZRG1-BST-E(51) on Predictive Multiscale Models of the Physiome in Health and Disease, Washington DC
03/08	Site reviewer, Special Emphasis Panel- ZRG1-SBIB-C (40) P, University of Southern California Biomedical Simulations Resource, Los Angeles, CA
03/07	Advisory Committee, Center for Scientific Review: Neurotechnology Working Group

National Science Foundation (selected,; Reviewer since 1998)

01/10	Reviewer, US-Israel Binational Science Foundation
06/09	Site visit team member, Directorate for Engineering, Division of Engineering Education and Research Centers, (Biomimetic Micro-Electronic Systems (BMES) Center at University of Southern California)
01/09	Panel Member, Collaborative Research in Computational Neuroscience (CRCNS)

06/07	IGERT pre-proposal panel, National Science Foundation
04/07	Site visit advisory board, Science of Learning Centers; Directorate for Social, Behavioral & Economic Science.
11/04; 11/02; 01/02	Site visit team member, Directorate for Engineering, Division of Engineering Education and Research Centers, (Neuromorphic Engineering Research Center at California Institute of Technology)

National Aeronautics and Space Administration

1994, 1995	Panel member, Life and Biomedical Sciences and Applications Division
------------	--

NATIONAL ORGANIZATIONAL COMMITTEES

2007-2008	NIH: Neural Interfaces Conference; Steering Committee member. Conference supported by U13 NS060636 (PI: Hunter Peckham, PhD Case Western Reserve University).
1998-2002	Univ. of Kentucky representative, Women in Engineering Programs & Advocates Network.
1997-1999	Region G representative, Society of Women Engineers; Women in Academia
1995-1998	Bluegrass Section, Region G representative to Council of Section Representatives. Society of Women Engineers

STATE GOVERNMENT COMMITTEES

05/09-04/11	Commissioner (Appointed by Governor pending Senate Confirmation), Biomedical Research Commission, Governor's Office of Boards & Commissions; State of Arizona
07/08-present	Technical Advisory Board, Arkansas Science & Technology Authority. Little Rock, AR.

PRIVATE FOUNDATION COMMITTEES

02/03-present	Alternate Chair, Bioengineering Technology Platform Engagement Committee, Flinn Foundation, Phoenix, AZ
11/04-present	Member, Bioimaging Technology Platform Engagement Committee, Flinn Foundation, Phoenix, AZ

EDITORIAL SERVICE

Editorship

2009-present	Associate Editor: Frontiers in NeuroMethods; A new paradigm Open Access journal; responsible for developing a new team of international reviewers and shaping the journal
2008-present	Associate Editor: Neural Networks, Elsevier (Official Journal of the International /European/Japanese Neural Network Societies (INNS, ENNS, JNNS))
2007-present	Associate Editor: IEEE Transactions on Biomedical Engineering (Official Journal of the IEEE Engineering in Medicine and Biology Society) (Assign and review 1-3 articles each month)

Reviewer

Journals	Annals of Biomedical Engineering	Journal of Applied Physiology
	American Journal of Physiology (Heart and Circulatory Physiology)	Journal of Neuroscience
	Biomedical Science and Instrumentation	Journal of Neurophysiology
	Behavioral and Cognitive Neuroscience Reviews	Journal of Neuroscience Methods
	Experimental Neurology	Journal of Pharmacology and Experimental Therapeutics
	IEEE Transactions on Biomedical Circuits & Systems	Neurocomputing
	IEEE Transactions on Biomedical Engineering	Neuroimaging
	IEEE Transactions on Neural Systems and Rehabilitation Engineering	Synapse

IEEE Transactions on Neural Networks

SYMPOSIA, WORKSHOPS AND CONFERENCE SESSION ORGANIZATION (SELECTED; INTERNATIONAL & NATIONAL- TOTAL 15)

- | | |
|-------|---|
| 01/09 | Organizer and Chair, 2 day Symposium and Workshop on <i>“Co-Adaptive Learning: Adaptive Technology for the Aging”</i> at Arizona State University, Jan. 8-9, 2009, Tempe, AZ. (Lectures by 6 national and international invited speakers from academia, clinical practice, and industry; poster session, discussion panels) |
| 06/08 | Steering Committee Member, <i>Neural Interfaces Conference</i> , & Chair and Organizer of Plenary Session 7, <i>“Sensory Feedback for Prosthetic Limbs”</i> , June 16-18, Cleveland, OH. |
| 03/07 | Organizer and Chair, 2 day Symposium and Workshop on <i>“Adaptation and Learning in Neuro-Biomechatronic Systems”</i> , The Biodesign Institute, March 22-23, 2007. (Lectures by 6 national and international invited speakers including one from National Academy of Engineering; extensive discussion panels) |
| 07/07 | Co-organizer with Dr. Sharon Crook (ASU), <i>“Neuro-Machine Interfaces: Integrating Biology and Technology to Develop Functionally Relevant Devices”</i> , 16th Annual Computational Neuroscience Meeting, CNS*2007, Toronto, Canada. (Invited speakers were from industry and academia) |
| 09/03 | Minisymposium Organizer and Co-Chair with Dr. Chi-Sang Poon (MIT), <i>“Nonlinear Dynamics and Control”</i> , 25 th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Sept. 17-21, 2003, Cancun, Mexico. |
| 04/97 | Session Organizer and Chair; <i>“Biomedical Engineering Education”</i> . American Society for Engineering Education, North Central Section. Spring conference, Dayton, OH. |

SERVICE to the UNIVERSITY

INSTITUTIONAL COMMITTEES

Arizona State University (selected key committees)

University Committees

- | | |
|-----------|---|
| 2006-2009 | Member, President’s Academic Advisory Council, Office of the President |
| 2007-2010 | Member, Faculty International Committee, Office of the VP for Global Engagement
Contributed to the strategic planning sub-committee
Research award committee (helped establish criteria and review proposals) |
| 2007 | Member, Graduate Faculty Committee, Office of the Graduate School
Helped establish the Graduate faculty model |
| 2003-2007 | Member, International Academic Programs Committee
Reviewed multiple international academic course offerings and student exchange programs |
| 2005-2006 | Member, Provost Search Committee |

Ira A. Fulton School of Engineering

- | | |
|-----------|---|
| 2003-2006 | Member, Dean’s Advisory Council |
| 2003-2007 | Member, Fulton School of Engineering Academic Standards Committee |

Harrington Department of Bioengineering

- | | |
|-----------|--------------------------------------|
| 2003-2007 | Member, Promotion & Tenure Committee |
|-----------|--------------------------------------|

The Biodesign Institute

- | | |
|-----------|--|
| 2005-2007 | Member, Personnel Committee for Research Faculty |
|-----------|--|

University of Kentucky (selected key committees)

College of Engineering

- | | |
|-----------|--|
| 1996-2002 | Faculty Counselor for student chapter, Society of Women Engineers
Best Student Section in the Nation (10 regions) (1998).
National Team-Tech award (1997, 1998) (Multidisciplinary teams solved problems identified by |
|-----------|--|

industrial partner; solutions were adopted by the industrial partners).
 National TRW Foundation Scholarship (1997, 1998, 2000), National Best Audio-Visual Presentation (1998), National Scribe award (1997); Academic Scholarship (1998, 2000).
 Best Student Section Region-G (26 sections) (1997, 1998, 1999).
 Established the "Margaret Ingels Society of Women Engineers Graduate Fellowship" through a \$50,000 endowment created from proceeds from the career fair run by the student chapter.

Center for Biomedical Engineering (CBME)

1995-1998 | Liaison between Department of Biosystems and Agriculture Engineering (BAE) and CBME for establishing a pre-biomedical engineering option for BAE undergraduates.

SERVICE TO INTERDISCIPLINARY EDUCATION (SELECTED)

Arizona State University

2008-present | Graduate faculty in Neuroscience, Mathematics and Electrical Engineering
 2003-2007 | Steering Committee member in NSF IGERT Program on Neural & Musculoskeletal Adaptation in Form & Function
 2002-present | Mentor in School of Life Sciences Undergraduate Research program; ASU/NASA Space Grant intern program; undergradaute students from the Barrett Honors College

University Of Kentucky

1996-2002 | June 1996, 1997, 1998 Research mentor for summer fellows accepted by the 'NSF-REU program in Math and Engineering' at the University of Kentucky.
 July 1998 | Research Mentor for several undergraduate students from Departments of Electrical Engineering, Biosystems and Agriculture Engineering, and Biology

EXAM COMMITTEES

Arizona State University

Barrett Honors College and other Undergraduate Honors Theses (Total 4)
 Doctoral student: Comprehensive Exam (Total 7)
 Doctoral Student: Prospectus Exam (Total 7)

SUPERVISOR OF RESEARCH AND ADMINISTRATIVE STAFF

Research Staff

2010-present | Mallika Fairchild, PhD, Research Engineer
 2008-present | Alex, Iarkov, PhD, Research Scientist
 2006-present | James V. Lynskey, PhD, PT, Asst. Research Scientist (part-time)
 2008-2009 | Seung-Jae Kim, PhD, Asst. Research Scientist
 Prior to 2008 | Research Analysts (3); Research Engineers (3); Research technicians (4)

Administrative Staff

2007-present | Jeanine Elliott, Administrative Assistant, Center for Adaptive Neural Systems
 2008-2009 | Nikki Thompson, Business Manager, Center for Adaptive Neural Systems
 Prior to 2007 | Program Coordinators (2); Administrative Assistant (1)

MENTORSHIP

Mentor for Postdoctoral Students

2009-present | Alfred Haas, (PhD Electrical Engineering, U Maryland College Park), Nov '09- present (co-mentor with Dr. James Abbas)
 2008-present | Sharmila Venugopal (PhD Neuroscience, Ohio State U), Oct'08- present
 06-12/2008 | Joe Graham (PhD Bioengineering, Arizona State U), June '08 – Dec'08
 Current Status: Adjunct Res. Scientist, Center for Adaptive Neural Systems, Arizona State U

2006-2008	<u>Seung-Jae Kim</u> (PhD Bioengineering, U Utah), Aug'06-Aug'08 Current Status: Research Fellow, Massachusetts Institute of Technology
2004-2006	<u>James Lynskey</u> (PT, PhD Neuroscience, Georgetown U), Dec.'04-June '06 Current Status: Assistant Professor - Physical Therapy, AZ School of Health Sciences, A.P. Still University, Joint Appointment as Research Scientist, Center for Adaptive Neural Systems, Arizona State U
2004-2006	<u>Tsukasa Kanchiku</u> , MD, PhD Orthopedic Surgery/Biomechanics, Aug.'04- June '06 Current Status: Assistant Professor, Department of Orthopedic Surgery, Yamaguchi University Graduate School of Medicine, Yamaguchi, Japan
2003-2004	<u>Kazuhiko Ichihara</u> , MD, PhD Orthopedic Surgery/Biomechanics, Feb.'03- July '04 Current Status: Chief Doctor - Orthopedic Surgery, Department of Orthopedic Surgery, Kyoritsu Hospital, Yamaguchi, Japan
2001-2002	<u>Thomas D. Coates</u> , (PhD Penn State U), Aug.'01- July '02 Current Status: Small Business Owner- TC Design Group LLC.

Mentor & Chair of Graduate Student Dissertations (PhD)

2009-present	<u>David Guffrey</u> , PhD program, Biomedical engineering, Arizona State U
2009-present	<u>Sathyakumar SK</u> , PhD program, Biomedical engineering, Arizona State U
2005-present	<u>Brian Hillen</u> , PhD program, expected graduation Spring 2010; Bioengineering, Arizona State U Dissertation title: <i>Modeling the effects of Neuromuscular Changes after incomplete Spinal Cord Injury on Rodent Locomotion</i> (Working title). Research Supported by: NIH:R01NS054282
2004-2009	<u>Mallika Fairchild nee Mukherjee</u> , PhD Fall 2009. Bioengineering, Arizona State U Dissertation title: <i>Strategies for Promoting Neural Plasticity after Spinal Cord Injury</i> ; Research Supported by: NIH:R01NS054282 and Science Foundation Arizona Current Status: Research Engineer , Center for Adaptive Neural Systems
2003-2008	<u>Joe Graham</u> , PhD Spring 2008. IGERT Fellow and Bioengineering, Arizona State U Dissertation title: <i>Modeling Motoneurons and the Effects of Spinal Cord Injury</i> Research Supported by: NIH:R01NS054282
1996-1998	<u>Breton Losch</u> , PhD program, Center for Biomedical Engineering, U of Kentucky Supported by: NSF (IBN-9601345) Transferred to Electrical Engineering

Mentor & Chair of Graduate Student Master's Theses

2008-present	<u>Sambhavi Subramanian</u> , MS program, Bioengineering, Arizona State University (expected graduation Spring 2010)
2003-2005	<u>Adam Belanger</u> , MS Fall 2005, Bioengineering, Arizona State U Thesis title: <i>The Effects of Therapeutic Neuromuscular Stimulation Following Incomplete Spinal Cord Injury</i> . Research Supported in part by: NIH:R01HD40335 Current Status: Engineer, BioRec, Inc. Tempe, AZ
2002-2005	<u>Ganapriya Venkatasubramanian</u> , MS Fall 2005. Bioengineering, Arizona State U Thesis title: <i>A Rodent Model for Locomotor Training after Spinal Cord Injury Using Functional Neuromuscular Stimulation</i> . Research Supported by: NIH:R01HD40335 Current Status: Research Associate, Sports Injury Prevention Center, Department of Kinesiology, University of Michigan, Ann Arbor, MI.
2000-2002	<u>Anil Thota</u> , MS Fall 2004. Center for Biomedical Engineering, U of Kentucky
2003-2004	Thesis title: <i>Neuromechanical Control of Locomotion in the Intact and Incomplete Spinal Cord Injured Rat</i> . Supported by: Kentucky Spinal Cord and Head Injury Research Trust and NIH:R01HD40335 Current Status: Biomedical Engineering doctoral student, Case Western Reserve University, Cleveland, OH.

2003	<u>KrishnaMohan Veeraghavalu</u> , MS program, Electrical Engineering, Arizona State University (Changed to MS-non thesis option)
1997-2000	<u>Sarvani Grandhe</u> , MS Spring 2000. Center for Biomedical Engineering, U of Kentucky Thesis title: <i>Perturbation Analysis of the Locomotor System</i> . Supported by: NIH-RR12588 and NSF (IBN-9601345) Current Status: Sr. Software and Systems Engineer, Boston Scientific, CA.
1997-2000	<u>Dan Li</u> , MS Fall 2000. Center for Biomedical Engineering, University of Kentucky Thesis title: <i>Time Varying Analysis of Rhythmic Locomotor Activity of the In-Vitro Neonatal Rat Spinal Cord</i> Supported by: Kentucky Spinal Cord and Head Injury Research Trust (MAR-9606-K3) to R. Jung Current status: Senior Scientist; Boston Scientific Corporation, St. Paul, MN.
1998-2000	<u>Heng Wang</u> , MS Fall 2000. Center for Biomedical Engineering, University of Kentucky Thesis title: <i>Effects of Supraspino-Spinal Interactions on Variability in the Lamprey Locomotor Rhythm</i> . Supported by: Grants from NSF (IBN-9601345) and The Whitaker Foundation Last known status: Researcher, University of Michigan.
2001-2004	<u>Jayaroop Guallapalli</u> , MS Fall 2004, Dept. of Electrical and Computer Engineering, University of Kentucky. Dr. P Hardy took over as primary advisor in August 2002 when R Jung moved to ASU Thesis title: <i>Monitoring Recovery from Spinal Cord Injury Using Magnetic Resonance Imaging</i> . Research Supported by: Kentucky Science and Education Fund.
1998-1999	<u>Min Shao</u> , MS program, 1998–1999, Center for Biomedical Engineering, University of Kentucky; Supported by: NSF (IBN-9601345) (Did not complete program)
1997-1998	<u>Jeeyune Jung</u> , MS program, 1997-1998, Center for Biomedical Engineering, University of Kentucky. Supported by: The Whitaker Foundation (Did not complete program)

Mentor for Interdepartmental Neuroscience Program Students

1998 | Tomoko Sengoku, Research Rotation, University of Kentucky

Mentor & Chair of Undergraduate Honors Theses

2003-2004	<u>Taryn Jensen</u> , The Barrett Honors College (Thesis research advisor) Thesis: <i>Posture Control in Rats with Incomplete Spinal Cord Injury</i> Current Position: Associate Research & Development Engineer, Medtronic, Inc.
1998	<u>Justin Kieler</u> , Honors in Biophysics (Thesis research advisor) Thesis: <i>Feedforward and Feedback Contributions to the Central Pattern Generating Model of Locomotion in the Lamprey</i>
1996	<u>Bradley Brewer</u> , Honors in Biology (Thesis research advisor) Thesis: <i>Contributions of Pacemaker Neurons to the Central Pattern Generator for Locomotor Control in the Lamprey</i>

Mentor of Undergraduate Researchers and High School students (Total 58)

Students conducted Senior capstone design; independent research; and NSF funded academic and summer fellowships

ARIZONA STATE UNIVERSITY

Bioengineering	School of Life Sciences/Psychology/Biology & Society
Electrical Engineering	Society
Barrett Honors College	High School students

UNIVERSITY OF KENTUCKY

National Science Foundation - U Kentucky	Biosystems and Agriculture Engineering
Research Experience for Undergraduate Fellows (8 weeks – Summer program)	Electrical Engineering Mechanical Engineering
Biology	High School students

Member (non-chair) of Graduate Student Dissertation (PhD) Committees

(Arizona State U- Bioengineering: 11; Electrical Engineering:1; Mathematics: 1, Biology: 1)

Member (non-chair) of Graduate Student Master's Thesis Committees

(Arizona State U- Bioengineering: 12; Electrical Engineering: 1; U Kentucky - Biomedical Engineering: 1)

COURSES TAUGHT

ARIZONA STATE UNIVERSITY (SELECTED)

Undergraduate Courses (Bioengineering)

ASU 101	<u>The ASU Experience</u> , Instructor (1 credit, Fall 2009) An introduction to the Fulton School of Engineering and Arizona State University for Bioengineering Majors (Freshmen class; co-taught with Jit Muthuswamy)
BME 419	<u>Biocontrols</u> , Instructor (3 credits; Fall 2007; 2008; 2009) Seniors in bioengineering. Introduced research paper review in 2007; Added computer project in 2008.
BME 413/513	<u>Bioinstrumentation</u> , Instructor (3 credits; Fall 2004; 2005) Seniors in bioengineering; (80 students in Fall 2004)
BME 423/523	<u>Bioinstrumentation Lab</u> , Instructor (1 credit; Fall 2004) Seniors in bioengineering (80 students)
BME 492	<u>Honors Research</u> (1-3 credits; Fall 2008) Independent Study by Seniors from Barrett Honors College
BME 417	<u>BME Capstone Design I and II</u> (4 credits; Fall 2003-2005; Fall 2007-2008, Spring 2004-2006, Spring 2008, 2009, 2010) Individual and Group Student Projects; Provide mentorship and guidance to the students
BME 370	<u>Microcomputer Applications in Bioengineering</u> (3 credits; Spring 2010) Juniors in Biomedical Engineering (Lectures and Labs)

Undergraduate Courses (Electrical Engineering)

EE 489A	Senior design (2 credits, Spring 2004; Fall 2003) Individual Student Projects; Seniors in Electrical Engineering
---------	---

Undergraduate Courses (Barrett Honors College)

HON 498	Independent study (1-3 credits; Spring , Fall 2008, 2009, 2010)
---------	---

Undergraduate Courses (School of Life Sciences)

BIO 499/ BIO484/MBB484	Independent research (every semester since 2007)
---------------------------	--

Graduate Courses (Bioengineering)

BME 598	<u>Introduction to Neural Engineering-II</u> (4 credits; Spring 2009) New Core required course for "Neural Engineering" track co-developed and taught for the first time with James Abbas.
BME 598	<u>Computational Neuroscience</u> (4 credits; Spring 2008) New Core required course for "Neural Engineering" track co-developed and team taught for the first time. 1/3 course material based on previous courses offering by Jung in Fall 2003 & Spring 2007.
BME598P	<u>Neurotrauma: Repair, Regeneration and Functional Recovery</u> (3 credits; Spring 2004, 2005, 2006) New course developed to fulfill program development plan to Whitaker Foundation and fill gap in formal Neuroscience course offerings

BME 598L	<u>Computational Neuroscience</u> (3 credits; Fall 2003; Spring 2007) New course developed. Covered single cell and small networks, basics of nonlinear dynamics for one dimensional and two-dimensional flows, application of nonlinear dynamical systems theory to analyze the behavior of the mathematical models. Basis of core neural track course.
BME 591	<u>IGERT Neural and Musculoskeletal Form and Function</u> (4 credits; Spring 2005) New Material developed; Team taught course; Responsible for 1 lecture
BME 598	<u>Scientific Communication</u> (1 credit; Fall 2007, 2008) New lecture material developed; team taught course

UNIVERSITY OF KENTUCKY (SELECTED)

Undergraduate Courses (Electrical Engineering; secondary faculty appointment in EE from 1998-2002)

EE 579	<u>Neural Engineering-Merging engineering with neuroscience</u> (3 credits, Spring 2001, 2002) New course developed and formally approved, cross-listed as BME579; Graduate students and seniors in engineering;
EE 599	<u>Neural Engineering</u> (3 credits, Spring 1998, 1999) Precursor to EE579/BME 579 described above
EE 499	<u>EE Design</u> (3 credits; Spring 2000) New topic every time; EE Design, juniors and seniors in electrical engineering
EE 595	<u>Independent Problems</u> (3 credits; Spring, Fall 2000) New Topic every time

Undergraduate Courses (offered through Graduate Program in Biomedical Engineering)

BME 481G	<u>Special Topics (Data Acquisition and Control for Neurophysiology)</u> (Fall 1997, 1999, 2000, 2001) New course developed; seniors in engineering
----------	--

Undergraduate Courses (Biology)

BIO 395	<u>Research in Biology</u> (variable credits; Spring 1996, 1998, 2000; Fall 1995, 1996, 1999, 2000) New topic every time; seniors in biology/biophysics
---------	--

Graduate Courses (Biomedical Engineering)

BME 781-05	<u>Special Topics (Computational Neuroscience)</u> (3 credits; Spring 1998, 1999; Fall 2000, 2001) New course developed
BME 501	<u>Foundations in Biomedical Engineering</u> (3 credits; Fall 1999, 2001,2002) New course co-developed with other faculty; Team taught Graduate/undergraduate students in engineering

INDIVIDUAL LECTURES

Multiple lectures given in different programs identified below

ARIZONA STATE UNIVERSITY

Interdisciplinary Neuroscience Program at Arizona State University
 University of Arizona College of Medicine, Phoenix in partnership with Arizona State University
 School of Life Sciences at Arizona State University
 Bioengineering

UNIVERSITY OF KENTUCKY

Anatomy and Neurobiology/Physiology
 Mathematics
 Bioengineering

UNIVERSITY OF MARYLAND

Neuroscience