

# **BIOENGINEERING**

## **Fall 2019 Seminar**

**Date:** Thursday, October 3, 2019  
**Time:** 12:00 pm - 1:00pm  
**Location:** Exploratory Hall, Room L111  
(Videoconferencing to SciTech, K. Johnson Hall Rm 254)



### **Ranu Jung, Ph.D.**

**Biography:** Ranu Jung holds the Wallace H Coulter Eminent Scholar endowed Chair in Biomedical Engineering at Florida International University (FIU) where she is Head of the Department of Biomedical Engineering. She served as Interim Dean of the FIU College of Engineering and Computing from 2015 to 2017. Previously she was a member of the faculty at Arizona State University and University of Kentucky. Professor Jung's research is at the cutting edge between engineering and neuroscience, developing devices that lead to scientific advances with clear pathways to clinical application. Of special interest to her are biohybrid systems merging biologically inspired technologies with

humans for recovery and restoration of lost function. Her team developed the first wireless, implantable, investigational neural-interface system for restoring sensations to amputees and received FDA approval to conduct a first-in-human early feasibility trial. Holder of 9 U.S. patents, founder of one R&D Company, Jung is a Fellow of the National Academy of Inventors and the American Institute for Medical and Biological Engineering, Senior Member of IEEE and Society of Women Engineers, and elected to the International Women's Forum. She has chaired or served on advisory committees and scientific review panels for the US National Institutes of Health, the US National Science Foundation, research foundations, international universities and professional journals. In 2011 she conceived, edited and published "Biohybrid Systems: Nerves, Interfaces and Machines" and in 2015 as co-Editor-in-Chief she published the first edition of a four volume "Encyclopedia of Computational Neuroscience". Her honors include the FIU 2016 Outstanding Faculty Torch Award, 2012 FIU Top Scholar Award, 2011 New Florida Scholar's Boost Award, 2002 Kentucky Science and Engineering Award and Governor's certificate of recognition, Whitaker Foundation Young Investigator Award, NIH National Research Service Award, AHA NE Ohio Research Fellow and appointment as commissioner, Arizona Biomedical Research Commission. Jung received her Doctoral degree and Masters in Biomedical Engineering from Case Western Reserve University, USA and her Bachelors with Distinction in Electronics & Communication Engineering from National Institute of Technology, Warangal, India.

**Title:** Bioelectronics for Restoration of Impaired Autonomic or Somatosensory Functions

**Abstract:** Direct neural interface bioelectronic systems have made it possible to achieve real-time neuromodulation, but full and reliable integration is still far from reality. This talk will present neural engineering and computational neuroscience approaches for the development of bioelectronic systems that merge man and machine to restore lost function. We will examine how neural models of the control of breathing can be used in the design of adaptive control of diaphragmatic pacing for restoration of impaired autonomic control of ventilation, and how focal intrafascicular peripheral nerve stimulation can restore sensation to upper-limb amputees with a neural-enabled prosthetic hand system.