ELECTRICAL & COMPUTER ENGINEERING BIO-SEMINAR Fall 2016

When: **Friday 15:00 – 16:00**
Where: **HRBB 204**
Coordinator: **Xiaoning Qian** (xqian@ece.tamu.edu)

Speaker: Prof. Sung Il Park

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Title: Hacking Nervous System: Opportunities and Challenges in Soft Wireless Bioelectronics

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Abstract: With the rapid rise in technology for precision detection and modulation of neural activities in the brain, peripheral nervous systems, and central nervous systems, a new class of treatment called as bioelectronics medicines seems be within ranges. Specifically, peripheral nerves are at the center of these advances as functions it controls in chronic diseases are extensive and its small numbers of fibers per nerve render them more tractable to targeted modulation. The vision for bioelectronics medicines is one of implantable and miniaturized devices that can be attached to individual nerves anywhere in the viscera. Such platform will be able to decode and modulate neural activities, and the precision could be further enhanced through a closed loop control system that can control neural interfaces and integrate data transmission, power management, and signal processing.

In this talk, I will describe our efforts to expand the reach and capabilities of soft wireless bioelectronics that spans from designing soft neural interface technologies to developing fully implantable wireless platform electronics that can record neural activities and physiological parameters, analyze the date in real time and modulate neural circuits accordingly with optogenetics studies in the brain, peripheral nerves, and spinal cords.

Biography: Sung Il Park is an assistant professor in Texas A&M university. Dr. Park earned his Ph.D. in electrical engineering from Stanford University, his M.S. from the University of Texas at Austin, and B.S.E degree from Hanyang University. His expertise is in soft neural interface, low power analog circuits, high frequency RF circuit and antenna, and wireless power/communications systems, and aims to create new technology, soft wireless bioelectronics, for interfacing with individual neurons in the nerve systems to complex neural circuits in the brain at a much finer scale and broader coverage than previously possible by providing insights of how these tools can be translated into clinical practice. He has served as a peer reviewer for Applied Physics Letters, IEEE Transaction on Biomedical Engineering, and Progress in Electromagnetics Research. His recent work on soft, stretchable, fully implantable miniaturized optoelectronic systems for wireless optogenetics has been featured in Nature Biotechnology and several news agencies.