
Electrical & Computer Engineering
S E M I N A R
Louisiana State University

**Low-Power, High-Performance, and Smart
Circuits and Systems for Diagnosis and
Treatment of Neurological Disorders**

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Abstract—According to the World Health Organization, around one billion people worldwide are affected by neurological disorders, ranging from Parkinson’s Disease to peripheral neuropathy. Conclusive diagnosis of many of these disorders can only be made through tests requiring use of large, expensive, time-consuming, and uncomfortable tools, which cannot be operated outside the clinic. Therefore in many cases, patients are diagnosed and receive treatment only after they visit the clinic when symptoms occur. An increasingly popular treatment option for many neurological disorders, such as sensory losses and mental problems, is electrical neuromodulation. Despite the collaborative research efforts of engineers and clinicians towards improving clinical outcomes from neuromodulation treatment, engineering challenges remain; designing energy-efficient and unobtrusive systems achieving closed-loop operation and improved-selectivity of stimulation pathways must still be tackled. This talk will focus on creating a new class of wearable and implantable sensing and neuromodulation systems that could be used by minimally-trained users in uncontrolled settings, thereby potentially enabling timely diagnosis and effective management of neurological disorders. The talk will emphasize robust, energy-efficient circuits as well as systems design approaches to address the engineering challenges of building such high-performance and smart systems and researching their translation into clinical use.

Bio—Hakan Töreyn received the B.S. degree in electrical and electronics engineering from Middle East Technical University, Ankara, Turkey, and the M.S. and the Ph.D. degrees in electrical and computer engineering from Georgia Institute of Technology, Atlanta in 2007, 2008, and 2014, respectively. Dr. Töreyn is currently a postdoctoral researcher in the School of Electrical and Computer Engineering at Georgia Institute of Technology. In 2007-2008 he was a Fulbright Fellow and in 2012 he was awarded the Chih Foundation Research Award. At the IEEE EMBC 2014 Student Paper Competition, he was recognized as the North America Finalist and awarded the third prize. Dr. Töreyn’s research interests include energy-efficient circuits and systems design for wearable and prosthetic biomedical applications.

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Where: Room 117 EE Building
Info: <http://www.ece.lsu.edu/seminar>

