

İ.T.Ü. ELEKTRİK-ELEKTRONİK FAKÜLTESİ
ELEKTRONİK VE HABERLEŞME MÜHENDİSLİĞİ BÖLÜMÜ

SEMİNER DUYURUSU

WIRELESS MEDICAL TELEMETRY: CURRENT STATUS AND FUTURE CHALLENGES

Prof. Dr. Erdem TOPSAKAL
Chair of Electrical and Computer Engineering Department
Virginia Commonwealth University

TARİH : 29 ARALIK 2015 SALI

SAAT : 14:00

YER : EEF-İdris Yamantürk Konferans Merkezi-1302

Abstract: Transformation of healthcare from reactive and hospital-centered to preventive and person-centered mandates development of new technologies that would enable “*long-term continuous monitoring*” of all physiological parameters. As a result, early diagnostics capabilities will also be enhanced tremendously and active management of own health by improving the lifestyle will become a reality. Among the critical physiological parameters requiring continuous monitoring are blood levels of glucose, cholesterol, uric acid, lactic acid, and calcium, iron, magnesium, and potassium ions, etc. The most effective way to monitor these parameters is through subcutaneous sensors, which can provide high sensitivity and accuracy owing to their direct access to the interstitial fluid, unlike noninvasive technologies such as bioimpedance, infrared, Raman, optical coherence, etc.. However, current state-of-the-art implantable sensors, *e.g.* for glucose monitoring, have limited functional longevity (1 week) due to degradation and fouling from fibrosis and inflammation. It is thus imperative to develop biocompatible biosensors that can remain functional in the body for an extended period (>1 year). In this presentation, I will discuss existing and emerging wireless medical telemetry technologies that can potentially extend the lifetime of implants.

Short Bio: Erdem Topsakal received his BSc. degree in 1991, M.Sc. degree in 1993 and PhD degree in 1996 all in Electronics and Communication Engineering from Istanbul Technical University. He worked as an Assistant Professor in Electrical and Electronics Engineering Department at Istanbul Technical University between 1997 and 1998. He was a post-doctoral fellow from 1998 to 2001 and an assistant research scientist from 2001 to July 2003 in Electrical Engineering and Computer Science Department of the University of Michigan. In August 2003, he joined the Electrical and Computer Engineering Department of James Worth Bagley College of Engineering at Mississippi State University as an Assistant Professor and worked at the same institution until May 2015. He is currently a tenured full Professor and Department Chair at Virginia Commonwealth University in Richmond, Virginia. His research areas include implantable antennas, numerical methods, cancer monitoring and detection, microwave hyperthermia, fast electromagnetic methods, antenna analysis and design, direct and inverse scattering. He has published over 160 journal and conference papers in these areas. He received the URSI young scientist award in 1996 and NATO fellowship in 1997. He is the recipient of 2004-2005 Mississippi State University Department of Electrical and Computer Engineering outstanding educator award, 2009 Bagley College of Engineering Research Paper of the Year Award, and 2010/2011 Mississippi State University State Pride Award. He is a senior member of IEEE and an elected member of the URSI commissions B and K. He served as the Associate Editor for IEEE Antennas and Wireless Propagation Letters (AWPL) from 2006-2015, Associate Editor for URSI Radio Science Bulletin 2011-2014, and Chair for URSI-USNC Commission K, Electromagnetics in Biology and Medicine from 2012-2015. He is currently the Chair of the USNC URSI student paper competition. He is on the IEEE USA Committee on Communications & Information Policy as a representative of IEEE Engineering in Medicine and Biology Society. He is a member of National Institute of Health SBIB (10) Biomedical Imaging study section. He is also a member of electrical engineering honor society, eta kappa nu. He is the founder of Mississippi State University Ballroom Dance club which has been active since 2005.