Healthcare Goes Wireless: Body Area Networks

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5:00–6:00 pm, Friday, Nov. 15, 2013, ENG LG06

ABSTRACT
The past decade has witnessed many significant advances in the use of wireless technologies in healthcare. This presentation offers a high level overview of various aspects of wireless technologies that are being used in healthcare applications with emphasis on body area networks. As wireless devices and networks are becoming ubiquitous their energy consumption is gradually increasing. Minimizing the total energy-consumption in both circuits and signal transmission is an important requirement in the design of future wireless networks. This requirement have led to a push towards green wireless communications and have created inter-disciplinary research challenges in hardware and protocols in different layers of the wireless stack. Central to this research area is to development of energy-efficient physical layer modulation and coding schemes. This presentation introduces some theoretical concepts of energy efficiency along with the system view emphasis on green modulation & coding. Emphasis is given on how these concepts can be applied in actual energy-constrained body area networks. Open research issues and future trends will be briefly discussed.

BIOGRAPHY
Konstantinos N. (Kostas) Plataniotis is a Professor with the ECE Department at the University of Toronto. He is the founder and inaugural Director–Research for the Identity, Privacy and Security Institute (IPSI) at the University of Toronto and he has served as the Director for the Knowledge Media Design Institute (KMDI) at the University of Toronto from January 2010 to July 2012. His research interests are: knowledge and digital media design, multimedia systems, biometrics, image & signal processing, communications systems and pattern recognition. Among his publications in these fields are the recent books WLAN positioning systems (2012) and Multi-linear subspace learning: Reduction of multidimensional data (2013).

Dr. Plataniotis is a registered professional engineer in Ontario, Fellow of the IEEE and Fellow of the Engineering Institute of Canada. He has served as the Editor-in-Chief of the IEEE Signal Processing Letters, and as Technical Co-Chair of the IEEE 2013 International Conference in Acoustics, Speech and Signal Processing. He is the IEEE Signal Processing Society Vice President for Membership (2014–2016). He has received the IEEE Canada Engineering Educator Award for “contributions to engineering education and inspirational guidance of graduate students”.