

Department of Electrical and Computer Engineering

Title: «Antenna applications of Metamaterials with emphasis on
Implantable Biomedical Devices»

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Wednesday, 5th February 2014, 17:30 – 18:30
Room KENTP. - A008, Old Campus
University of Cyprus

Abstract:

Wireless connectivity with implantable biomedical devices is becoming increasingly important for patient monitoring, as well as monitoring the status of the biomedical devices, while reporting back the data from their sensors. Additionally, wireless power transfer directly to the implanted devices can reduce the need for additional medical procedures for battery replacement. In this presentation, the basic operation of transmission-line based metamaterials as these relate to antenna applications will be presented. Subsequently, various metamaterial-based antenna designs will be presented that are suitable for integration with implantable biomedical devices such as heart pumps, pacemakers or cardiac defibrillators.

Biography:

Marco A. Antoniadis (S'99-M'09) received the B.A.Sc. degree in electrical engineering from the University of Waterloo, ON, Canada, in 2001, and the M.A.Sc. and Ph.D. degrees in electrical engineering from the University of Toronto, ON, Canada, in 2003 and 2009, respectively.

From 1997 to 2001, he worked for a number of telecommunications and engineering companies, including Spacebridge, Cisco, Honeywell, Ericsson and Westinghouse, as part of the work-experience program at the University of Waterloo. From 2001 to 2009, he was a research assistant at the University of Toronto, where he developed microwave devices and antennas based on negative-refractive-index transmission-line (NRI-TL) metamaterials. He continued working in this area as a post-doctoral fellow at the University of Toronto from 2009 to 2011. In 2011, he joined the School of Information Technology and Electrical Engineering at the University of Queensland, Australia as a Lecturer. In 2013, he joined the Department of Electrical and Computer Engineering at the University of Cyprus, also as a Lecturer. He has authored over 50 refereed publications, and has coauthored two book chapters titled *Antenna Applications of Negative Refractive Index Transmission-Line (NRI-TL) Metamaterials* that appears in the *Modern Antenna Handbook*, edited by C.A. Balanis (New Jersey: John Wiley & Sons, 2008) and *Compact Planar Multiband Antennas for Mobile Applications* that appears in *Advancements in Microstrip and Printed Antennas*, edited by A. Kishk (InTech, 2013). His research interests include passive and active antenna design, RF/microwave circuits and negative-refractive-index metamaterials for use in broadband wireless communications, radio-frequency identification, wireless sensing, biomedical applications and alternative energy systems.

Dr. Antoniadis received the Hellenic Canadian Federation of Ontario Academic Excellence Award in 2003, and the Edward S. Rogers Sr. Graduate Scholarship from the University of Toronto in 2003–2004 and 2004–2005. He also received the First Prize in the Student Paper Competition at the 2006 IEEE AP-S International Symposium on Antennas and Propagation. In 2009–2011, he was the recipient of the Ontario Post-Doctoral Fellowship from the Ministry of Research and Innovation of Ontario. He has served on the steering committee for the 2010 IEEE AP-S International Symposium on Antennas and Propagation. He has also served on the technical program committee for the IEEE AP-S International Symposium on Antennas and Propagation from 2010 to 2013 and for the 2013 and 2014 IEEE Radio and Wireless Symposium.