Title: "Single-radio antenna arrays for reduced transmission power and circuit energy consumption"

Abstract:

Antenna arrays have been known for a long time as important enablers of advance wireless communication, offering, among other things, the ability to provide the same level of performance at reduced transmission power. This general trend holds for the entire gamut of multi-antenna transmission / reception schemes, ranging from beam forming to space-time coding to MIMO transmission and beyond. In this presentation, we examine how these schemes can be implemented in antenna arrays with a single active radio (often called parasitic antenna arrays). After reviewing some representative approaches for implementing the above mentioned schemes with parasitic antenna arrays, we also discuss their ability to reduce, beyond RF power, the power consumed at the transmitter / receiver device. A quantification of such power savings is also provided for selected applications. Overall, the message of the presentation is that the use of compact, such as parasitic, antenna arrays, can play an important role in reducing not only RF emissions but also circuit energy consumption in future wireless communication systems.

BIO:

Constantinos B. Papadias was born in Athens, Greece, in 1969. He received the Diploma of Electrical Engineering from the National Technical University of Athens (NTUA) in 1991 and the Doctorate degree in Signal Processing (highest honors) from the Ecole Nationale Supérieure des Télécommunications (ENST), Paris, France, in 1995. From 1992 to 1995, he was Teaching and Research Assistant at the Mobile Communications Department, Eurécom, France. In 1995, he joined the Information Systems Laboratory, Stanford University, Stanford, CA, as Post-Doctoral Researcher, working in the Smart Antennas Research Group. In November 1997 he joined the Wireless Research Laboratory of Bell Labs, Lucent Technologies, Holmdel, NJ, as Member of Technical Staff and was later promoted to Technical Manager. From 2004 to 2005 he was an adjunct Associate Professor at Columbia University. In 2006 he joined Athens Information Technology (AIT) in Athens Greece, as an Associate Professor and was later promoted to Professor. He is also currently an Adjunct Professor at Carnegie Mellon University's Information Networking Institute (INI), as well as AIT's Doctoral Program Academic Director. His research interests range from baseband wireless communications and smart antenna systems to scheduling and system-level optimization of wireless systems to cognitive radio and multihop wireless sensor networks. He has published over 130 papers, 5 book chapters and one edited book and one research monograph on these topics (with one more book under preparation) and has received over 3000 citations for his work. His distinctions include the 2002 Bell Labs President's Award, a Bell Labs Teamwork Award, the 2003 IEEE Signal Processing Society's Young Author Best Paper Award and ESI's "most cited paper of the decade" citation in the

area of wireless networks in 2006. A recent paper that he co-authored entitled “Is the PHY layer dead?” was rated as the 3rd most downloaded IEEE document on IEEE Xplore in April of 2011. He has also made standards contributions (most notably as the co-inventor of the Space-Time Spreading (STS) technique that was adopted by the cdma2000 wireless tandard for voice transmission) and holds 12 patents. He has participated in several European Commission research projects and is currently the Technical Manager of two FP7 Future & Emerging Technologies (FET) projects: “CROWN,” in the area of cognitive radio networks and “HIATUS,” in the area of interference alignment. He has served on the steering board of the Wireless World Research Forum (WWRF) from 2002-2006. He was a Member of the IEEE Signal Processing for Communications Technical Committee from 2002-2008, acting as its Industrial Liaison, and is currently an Associate Editor of the IEEE Transactions on Wireless Communications and the Journal of Communications and Networks. From 2007-2009 he was a National Representative of Greece in the European Commission’s FP7 program “IDEAS.” Dr. Papadias is a Senior Member of the IEEE and a member of the Technical Chamber of Greece.