



INSTITUTO DE INGENIEROS ELECTRICISTAS
COLEGIO DE INGENIEROS Y AGRIMENSORES DE PUERTO RICO

' Parte Activa de un Nuevo Milenio '



Short Seminar Series

This seminar will cover three subjects of one hour each. The subjects are, Energy Efficient Lighting, Wireless Communication and Cross Layer Design and Optimization for Broadband Wireless Networks. Description and lecturer biodata is presented below for each course. IEEE Continued Education Units (IACET CEU'S) will be awarded for this seminar.

Where: Antonio's Restaurant (1406 Magdalena Ave. Condado
Tel.787-721-2139).

When: Wednesday February 11, 2009 from 6:30 to 9:30 PM

Cost: \$30.00 per person

Howard Wolfman - Energy Efficient Lighting

Roberto de Marca - Wireless Communication

Khaled Letaief - Cross-Layer Design and Optimization for Broadband
Wireless Networks

Title: Lighting Energy Efficiency (Power)Abstract

Lighting systems energy efficiency had remained relatively stagnant for many years until the decades of the 1990's and 2000's. The increasing demand for energy along with the almost level supply of energy caused an energy shortage in many areas of the US. Puerto Rico, in particular is impacted by the almost equal supply of, and demand for, electricity (2008 estimates of 24.8 billion kWh production and 23.2 billion kWh demand). In addition, the average Puerto Rican rate charge for electricity of about \$0.14/kWh further amplifies the need for power conservation and increased efficiency of use.

The lecture will focus on the changes that have occurred in the type of, and efficiency improvements that have taken place in, light sources, drivers, and systems with examples of application alternatives.

Bio sketch: Howard Wolfman received his BSEE from the University of Illinois, MBA from Northwestern University, and is a Registered Professional Engineer in the State of Illinois. After 20 years of experience with Motorola Lighting and the Electronics and Controls Division of OSRAM SYLVANIA, he is now the principal of Lumispec Consulting, specializing in Management and Lighting Energy Efficiency. Howard is past Chairman of the NEMA (National Electrical Manufacturer's Association) Lighting Systems Division, past Chairman of the Ballast Section and the Lighting Controls Section. Howard also chairs the ANSI (American National Standards Institute) C82 main committee for lighting ballasts. He also serves as Chairman of the Controls Protocol Committee of the Illuminating Engineering Society of North America (IESNA) and is the head of the US



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Delegation to IEC TC34 and the Technical Advisor to the US National Committee for IEC TC 34C. Howard is currently serving as a member of the IEEE Standards Board, Awards Board, and a member of the Industrial Applications Society Production and Application of Light Committee. He has served as Region 4 Director and as IEEE Treasurer. Howard serves on the Underwriters Laboratory (UL) Standards Technical Panel (STP) for fluorescent and HID ballasts, the STP for Luminaires, and the STP for Solid State Lighting, as well as on the Canadian Standards Association (CSA) advisory committee for fluorescent ballasts. He is an adjunct full professor in the Master of Engineering Program at the University of Illinois at Chicago and has been a guest lecturer at universities worldwide. Mr. Wolfman has made numerous presentations and has authored many papers. He is a recipient of the IEEE Centennial Medal, the IEEE Third Millennium Medal, and the NEMA Kite and Key Award.

Title: Cross-Layer Design and Optimization for Broadband Wireless Networks

Over the past decade, wireless communications has seen an exponential growth and will certainly continue to witness spectacular developments due to the emergence of new interactive multimedia applications and highly integrated systems driven by the rapid growth in information services and microelectronic devices. To support such applications under limited radio resources and harsh wireless channel conditions, dynamic resource allocation, which achieves both higher system spectral efficiency and better Quality of Service (QoS), has been identified as one of the key and promising techniques. In particular, jointly optimizing resource allocation across adjacent and even non-adjacent layers of the protocol stack leads to a dramatic improvement in the overall system performance. In this talk, we will discuss the challenges facing the XG ubiquitous broadband systems and then describe some of the leading enabling technologies for increasing system capacity and spectral efficiency while meeting the stringent requirements of future networks. In particular, we shall provide an overview of recent research on dynamic resource allocation, especially for MIMO and OFDM systems. Recent work and open issues on cross-layer resource allocation and adaptation will also be discussed.

BIO data: Professor Letaief received the Ph.D. Degrees in Electrical Engineering from Purdue University, USA in 1990. From 1990 to 1993, he was a faculty member at the University of Melbourne, Australia. Since 1993, he has been with HKUST where he is a Chair Professor and Head of the Electronic and Computer Engineering Department and the Director of the Hong Kong Telecom Institute of Information Technology.

Dr. Letaief is an acknowledged authority in the area of wireless and mobile communications. He served as consultants for different organizations and is the founding Editor-in-Chief of the IEEE Transactions on Wireless Communications. He has served on the editorial board of other



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prestigious journals including the IEEE Journal on Selected Areas in Communications - Wireless Series (as Editor-in-Chief). He has been involved in organizing a number of major international conferences and events. These include serving as the Co-Technical Program Chair of the 2004 IEEE International Conference on Communications, Circuits and Systems, ICCCS'04; General Co-Chair of the 2007 IEEE Wireless Communications and Networking Conference, WCNC'07; as well as the Technical Program Co-Chair of the 2008 IEEE International Conference on Communication, ICC'08.

In addition to his active research and professional activities, Professor Letaief has been a dedicated teacher committed to excellence in teaching and scholarship. He received the Mangoon Teaching Award from Purdue University in 1990; the Teaching Excellence Appreciation Award by the School of Engineering at HKUST (4 times); and the Michael G. Gale Medal for Distinguished Teaching (Highest university-wide teaching award and only one recipient/year is honored for his/her contributions).

He served as the Chair of the IEEE Communications Society Technical Committee on Personal Communications, Chair of the 2008 IEEE TAB/MGA Visit Program, an elected member of the IEEE Communications Society Board of Governors, an IEEE Distinguished lecturer, and the Chair of the Steering Committee of the IEEE Transactions on Wireless Communications. He is the recipient of the 2007 IEEE Communications Society Publications Exemplary Award and a Fellow of IEEE.

Title: "Wireless Technologies: Current Scenario and Road Ahead" The evolution of wireless technology and services has been truly remarkable. The combination of wireless access and Internet is changing our daily lives and will continue to do so in the near future. Although the number of cellular handsets in the market is now measured in billions and there is an increase use of data applications, the use of wireless communication will not be restricted for interactions between human beings. New applications are being developed at this moment that will allow increased safety on the roads through data exchange among vehicles, improved healthcare service to remote populations and a myriad of enhanced business processes and applications due to the widespread use of radio enabled tags (RFID). In this presentation we will review the state of the art of wireless technologies, focusing primarily on those that are applicable to public access cellular systems. The key concepts that are allowing the increase in system capacity to satisfy the constantly increasing bandwidth demand will be highlighted. A broad view of current research topics will also be given, including examples of the benefits expected from a couple of these new areas. Finally, a personal view of how the market evolution of cellular technology will unfold will be offered.



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Biodata: J. Roberto B. de Marca received his undergraduate engineering degree from the Pontifical Catholic University in Rio de Janeiro, Brazil. He was a Fulbright Scholar at the University of Southern California, where he earned a Ph.D. in Electrical Engineering. After finishing his graduate studies, he joined the faculty of the Catholic University, Rio de Janeiro, where he has held several leadership and administrative positions including Associate Academic Vice President for Sponsored Research. Twice on leave, Dr. de Marca served as Scientific Consultant with AT&T Bell Laboratories, Murray Hill. He has lectured in several institutions in Europe and North America. In the first part of 2008 he was a Visiting Professor at the Hong Kong University of Science and Technology and in the second semester he was a Visiting Scientist with NEC Europe Network Laboratory in Heidelberg, Germany. He was the founding President of the Brazilian Telecommunications Society and in 1990, Prof. de Marca was appointed Scientific Director of the Brazilian National Research Council (CNPq) where he approved the initial funding of the national research network which opened the way for the widespread use of Internet in Brazil. He was a delegate to several ITU-R TG8/1 meetings, where the wireless 3G technology specifications were developed. He is an IEEE Fellow, a full member of the Brazilian Academy of Sciences and also a member of the advisory committee of Brazil's largest R&D funding agency, FINEP. Dr. de Marca was the 2000-2001 IEEE Communications Society President and served two years in the IEEE Board of Directors as Division III Director. In 2006 he served as IEEE Secretary. Prof. de Marca was the 2008 IEEE Vice President for Technical Activities.