



DEPARTMENT OF ELECTRICAL ENGINEERING

Graduate Seminar Guest Speaker

Dr. Dimitris Pados

Associate Professor

University at Buffalo, Department of Electrical Engineering

“Recent Advances in the Field of Information Theory”

Friday, February 23, 2007

11:00 AM

Knox 109

ABSTRACT

We will discuss some recent results in the field of Information Theory that are expected to impact significantly future communication practices and systems. Four diverse examples are chosen that indicate the breadth and span of the field and range from digital signature/waveform design and digital interference avoidance to steganography and steganalysis, and near-Shannon-limit performing linear block codes.

Optimal digital signature design provides sets of signatures (or codes or sequences) with minimal total squared correlation and has direct application to code division multiplexing problems. Digital interference avoidance shapes adaptively the waveform of a signal to maximize the post-filtering signal-to-interference-plus-noise ratio. Digitally optimized spread-spectrum steganographic embedding allows message hiding with minimal host medium distortion. Steganalysis is the reverse operation of recovering blindly an unknown hidden message. In the context of modern error correcting codes, new algebraically designed linear block codes are seen to offer error protection near the Shannon limit.

All presented results were developed in the Communications and Signal Laboratory at the Univ. at Buffalo under the sponsorship of U.S. AFOSR, National Science Foundation, and AFRL.

BIOGRAPHY

Dimitris A. Pados was born in Athens, Greece, on October 22, 1966. He received the Diploma degree in computer engineering and science (5-year program) from the University of Patras, Patras, Greece in 1989 and the Ph.D. degree in electrical engineering from the University of Virginia, Charlottesville, VA, in 1994.

From 1994 to 1997 he held an Assistant Professor position in the Department of Electrical and Computer Engineering and the Center for Telecommunications Studies, University of Louisiana, Lafayette. Since August 1997 he has been with the Department of Electrical Engineering, University at Buffalo, The State University of New York, where he is presently an Associate Professor. His research interests are in the general areas of communication theory and adaptive signal processing with emphasis on wireless multiple access communications, spread-spectrum theory and applications, coding and sequences. Dr. Pados served as an Associate Editor for the IEEE Signal Processing Letters from 2001 to 2004 and the IEEE Transactions on Neural Networks from 2001 to 2005. Articles that he co-authored with his students received a 2001 IEEE International Conference on Telecommunications best paper award and the 2003 IEEE Transactions on Neural Networks Outstanding Paper Award. Dr. Pados is a member of the IEEE Communications, Information Theory, Signal Processing, and Computational Intelligence Societies.