Πανεπιστήμιο Κύπρου
University of Cyprus

School of Engineering
Department of Electrical and Computer Engineering

IEEE
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Department of Electrical and Computer Engineering

Title: «*Some Key Elements of Cognitive Radio Research*»

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Room ΠΤΕΡ Ε113, Old Campus
University of Cyprus

Abstract:
The ever increasing demand for wireless bandwidth and the scarcity of available spectrum has led researchers to investigate the practicality of using cognitive (smart) radio technology to make more efficient use of the radio spectrum. This will require a multi-disciplined approach. An important step is the development of standard protocols and ontologies that will permit the rapid adaption of communication networks to changing spectrum conditions. This flexibility will require efficient designs that minimize overhead impact on the intended communication functions. The Wireless Center at IPFW is actively involved in this new area of cognitive radio technology. This presentation will give a summary of some our research in this area. Topics to be covered include:

1. Extension of the VITA-49 standard to the RF and digital interface of a software defined radio (SDR).

2. The development of a radio ontology that describes the RF capabilities of an SDR radio. The ontology facilitates the exchange of radio information necessary to adapt a cognitive radio network.

3. Efficient algorithms for network node sensing of the local spectrum environment. These are suboptimal algorithms that are computationally efficient compared to cyclo-stationary techniques and applicable to mobile SDR architectures.

Biography:

James C. Isaacs recently retired from ITT Corporation where he was a staff scientist in the communications division. He is now an adjunct professor at IPFW where he teaches in the Engineering and Computer Science Department. His current research interest is in cognitive radio technology, emergency communications, and DSP applied to communication systems. While at ITT Dr. Isaacs was the lead modem engineer for the JTRS soldier radio waveform, a military software defined radio program. He has over 30 years' experience in the area of military communications. Prior to working at ITT, he was employed at Honeywell Marine Systems and Bell Laboratories. Dr. Isaacs received his BSEE, MSEE, and Ph.D degrees from the University of Virginia. He is a Senior Life Member of the IEEE.

Todor Cooklev is Director of the Wireless Technology Center at Indiana University-Purdue University Fort Wayne, Fort Wayne, Indiana, and ITT Associate Professor of Wireless Communication and Applied Research at the same institution. He also has several years of industry experience in Silicon Valley, California on a full-time and part-time consulting basis. He has worked on the development of several standards for communication systems developed by various standardization organizations, serving at times in leadership roles. His research interests include signal processing, radio architectures, and software-defined radio.

Dr. T. Cooklev received the Best Paper Award at the 1994 Asia-Pacific Conference on Circuits and Systems, and the 1995 NATO Science Fellowship Award. He has a long record of service to the IEEE and the IEEE Standards Association. During 2012 he received an award from the IEEE Standards Association for his contributions to IEEE 802.11. He currently serves on the Editorial Board of the Journal of Purdue Undergraduate Research.