ACC double seminar on

Carrier Synchronization
in
Coherent Wireless Communications

Sunday, November 25, 2007
3:00 - 4:30PM

(coffee will be served from 2:45)

Claire and Emanuel G. Rosenblatt Auditorium
The Wolfson Computer and Software Engineering Building
Tel Aviv University

3:00 - 3:45

Self-Normalizing Structures for Synchronization and SNR Estimation in Coherent Wireless Communications

Dr. Yair Linn
Dept. of Electrical and Computer Engineering
University of British Columbia

Abstract: In this lecture we shall outline and investigate the usage of self-normalizing structures for synchronization and SNR (Signal-to-Noise Ratio) estimation in coherent wireless communications. The meaning of "self-normalizing" is, generally speaking, a structure whose dynamic range is inherently bounded by its mathematical characteristics. This has a profound impact on the design of the communications system and makes self-normalizing structures particularly attractive for usage in fixed-point logic within FPGAs (Field Programmable Gate Arrays) and ASICs (Application Specific Integrated Circuits). Often, the reduced dynamic range of the self-normalizing structure allows the design of the overall system to be much simpler and compact. Moreover, the proposed structures are shown to have excellent performance as compared to previously available structures

3:45 - 4:30

Mean Time to Lose Lock of Decision-Directed PLLs for QAM Modulation, with Applications

Prof. Ben-Zion Bobrovsky
School of Electrical Engineering
Tel Aviv University

Abstract— A method to evaluate the performance of phase detectors in a discrete-time decision-directed PLL under phase and channel noise conditions is developed. A continuous time model that closely approximate the loop’s behavior is determined, and the applicable S-curve and phase dependent noise function are computed. Fokker-Planck and singular perturbations techniques are used to compute the loop’s mean time to lose lock. The calculation is then applied to compare two common phase detectors under phase noise and noiseless conditions. The regions where one detector outperforms the other are demonstrated