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INTEGRATED CIRCUITS AND SYSTEMS GROUP (ICSG)

THE ICS SEMINAR SERIES

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Radio Frequency Interference Sensing and Mitigation in Wireless Receivers

Radio frequency interference (RFI) is a key limiting factor in communication performance of Wi-Fi, WiMax, cellular, and other wireless data communication systems. Sources of RFI include

1. other wireless users/services operating in the same frequency band, a.k.a. co-channel interference,
2. nearby electronic equipment, such as microwave ovens radiating in the 2.4 GHz band
3. the computational platform itself, including clock circuitry and power saving subsystems in laptops and notebooks.

In this talk, we present statistical modeling of platform RFI, validate the models using measured platform RFI datasets, and propose receiver designs for mitigating platform RFI. Several proposed designs demonstrate 10x-100x reduction in bit error rate for single-antenna and two-antenna receivers. The statistical models for platform RFI also model co-channel interference, and can be generalized to model RFI from nearby electronic equipment.

Biography:

Prof. Brian L. Evans is an IEEE Fellow "for contributions to multicarrier communications and image display". In multicarrier communications, his group developed the first linear complexity algorithm that allocates resources to optimize bit rates in multiuser OFDM systems (for cellular and WiMax) and is realizable in fixed-point hardware/software. His group also developed the first ADSL equalizer training method that maximizes a measure of bit rate and is realizable in real-time fixed-point software. In image display, his group's primary contribution is in the design, analysis, and quality assessment of halftoning by error diffusion for real-time processing by printer pipelines. (Error diffusion is two-dimensional data conversion by sigma-delta modulation.) He has graduated 16 PhD students and published more than 180 refereed conference and journal papers. He received a 1997 National Science Foundation CAREER Award.

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http://icsg.ece.utexas.edu/ics-seminar/