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ELECTRICAL & COMPUTER ENGINEERING
TEXAS A&M UNIVERSITY

S E M I N A R

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A CMOS Spectrum Sensor Based on Quasi-Cyclostationary Feature Detection for Cognitive Radios

by

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Abstract: : Sensitivity and sensing time are the key features for spectrum sensing in a cognitive radio (CR) which detects empty bands within VHF/UHF TV broadcast bands and uses them as a secondary user.
In this presentation, a fully integrated CMOS CR spectrum sensor for a CR receiver in 54-862 MHz band is presented. A quasi-cyclostationary feature (QCF) detector is proposed based on both energy and feature detection methods and can take advantage of both methods to reach a fast and accurate decision without the need for an analog-to-digital converter (ADC) for decision making. The integrated chip has been fabricated in a standard 0.18-µm CMOS IBM technology and has achieved minimum detection signal to noise ratio (SNR) of as low as -17 dB and dynamic range (DR) of 32 dB.

Paria Sepidband received the B.Sc. degree in electrical engineering from University of Tehran, Tehran, Iran, in 2010. She received the M.Sc. degree in electronics engineering from Sharif University of Technology, Tehran, Iran, in 2012. She is currently working toward the Ph.D. degree in electrical and electronics engineering at Texas A&M University, College Station, TX, USA. Since January 2013, she has been working as a Research Assistant at the Analog and Mixed Signal Center, Texas A&M University, College Station, TX. Her research interests include cognitive radios, spectrum sensing, and wideband receivers.