

Research Seminar

Energy and Information Systems (EIS)



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Systems (EIS)

Seminar Committee:

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Distributed Spectrum Sensing under Electromagnetic Interference and Fading

Dr. Vinod Sharma | Indian Institute of Science (Bangalore, India)

Thu. Nov. 5th, 2015 | 12:00-1:00 PM | Porter Hall B34

Seminar abstract:

A nonparametric distributed sequential algorithm for quick detection of spectral holes in a Cognitive Radio set up is proposed. Two or more local nodes make decisions and inform the fusion centre (FC) over a reporting Multiple Access Channel (MAC), which then makes the final decision. The local nodes use energy detection and the FC uses mean detection in the presence of fading, heavy-tailed electromagnetic interference (EMI) and outliers. The statistics of the primary signal, channel gain or the EMI is not known. Different nonparametric sequential algorithms are compared to choose appropriate algorithms to be used at the local nodes and the FC. Modification of a recently developed random walk test is selected for the local nodes for energy detection as well as at the fusion centre for mean detection. It is shown via simulations and analysis that the nonparametric distributed algorithm developed performs well in the presence of fading, EMI and is robust to outliers. The algorithm is iterative in nature making the computation and storage requirements minimal.

Speaker bio:

Vinod Sharma completed his PhD in ECE from CMU in 1984. After spending time at Northeastern University and UCLA, he joined Indian Institute of Science, Bangalore in 1988 where currently he is a professor in the ECE department. He was chairman of the department from 2006 to 2011. His research interests are in wireless communication, information theory and detection-estimation.

Seminar notes: Pizza will be served