

Registration

Registration fee Rs. 1000/- for students(UG and PG) / Research scholars Rs. 2000/- for others. The fee is payable by Demand Draft in favor of 'Director, Centre for Excellence in Microwave Engineering' payable at Hyderabad. Last date of receipts of registration form along with the fee is 15th December, 2009. Seats are limited; hence, candidates will be admitted on a first-come first-serve basis.

Travel/Accommodation:

All arrangements including travel, boarding and lodging should be made by the participants themselves.

ADDRESS YOUR ENQUIRIES TO

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WORKSHOP ON **Cognitive Wireless Communications Radar and Networks**

Venue: E-class room, University
College of Engg Main Building

8th January, Friday, 2010

Course Advisor
Prof. V.U. Reddy, IIIT, Hyderabad

Coordinator
Dr. V.M. Pandharipande



Organized by
Centre for Excellence in Microwave Engineering
(funded by Astra Microwave Products Limited)

Dept. of Electronics and Commn. Engineering,
University College of Engineering (A)

Osmania University,

Hyderabad – 500 007

About the Department

The Department of Electronics and Communication Engineering of Osmania University has completed 50 years of Excellence in Electronics Engineering Education and is recognized as one of the best departments in the state of Andhra Pradesh. The Department has successfully completed prestigious project IMPACT funded by World Bank, Project NETWORK funded by Swiss Development Cooperation, FIST project funded by Department of Science and Technology in addition to various sponsored projects funded by CSIR, DRDO, ISRO, Ministry of HRD, AICTE etc in the field of Digital Signal Processing, Microwave Engineering, Image Signal Processing, Microwave Engineering, Communication Systems, VLSI, VHDL.

About the Centre

The Centre for Excellence in Microwave Engineering was established in 2006 under the leadership of Prof. V.M. Pandharipande as its Director. The Centre is fully funded by Astra Microwaves Products Limited, Hyderabad, a leading Industrial Organisation in the field of RF, MIC^s, Antennas and Communication System products. The objective of the Centre is to create quality manpower in the field of RF and Microwave Engineering and to carry out frontier research in this state of the art technology field.

Tutorial 1: DoA Estimation and MIMO Radar
By Prof. V.U. Reddy IIIT Hyderabad

Tutorial 2: Cognition and cooperation for
spectrum sharing in future wireless networks

By Dr. Ashish Pandharipande, Philips Research,
The Netherlands

Tutorial 1:

Abstract: In this tutorial, we will first develop the subspace based DOA (direction-of-arrival) estimation algorithm for narrowband case and then discuss how this problem is addressed with several configurations of array geometry. To facilitate implementation of these techniques in practical applications, we need to resort to adaptive estimation of the underlying subspaces, and we present an efficient method for this. We briefly introduce the wideband case and the corresponding technique for DOA estimation.

Recently, MIMO (multiple-input multiple-output) radars have been receiving lot of attention since they provide (in addition to range and Doppler resolution) spatial resolution as well as spatial diversity which results in a significant reduction in target scintillations. We introduce briefly the ambiguity function in the MIMO case and present one method of waveform design based on hit-array formalism.

Speaker bio: Prof. Reddy was on the faculty of IIT, Madras, IIT, Kharagpur, Osmania University and Indian Institute of Science (IISc), and held several visiting appointments with Stanford University and University of Iowa. After retiring from IISc, he held positions of CTO and Chief Scientist with Hellosoft India Private Ltd, and Microsoft Chair Professor at IIIT, Hyderabad. Presently, he holds Institute Professor position with IIIT, Hyderabad and Distinguished Scientist Emeritus position with CR Rao Advanced Institute of Mathematics, Statistics and Computer Science, Hyderabad Central University Campus.

Prof. Reddy served on the Editorial Boards of Indian Journal of Engineering and Materials Sciences, and Proceedings of IEEE. He was the Chairman of Indian National Committee for International Union of Radio Science. He is a Fellow of the Indian Academy of Sciences, the Indian National Academy of Engineering, the Indian National Science Academy and the IEEE. He holds 2 US patents.

Tutorial 2:

Abstract: With the explosive growth of wireless communications, there has been an increasing demand for radio spectrum. To address the need for improved spectrum utilization, dynamic spectrum sharing models and in particular cognitive radios have received recent attention.

In this tutorial talk, we describe the motivation of spectrum sharing, resulting new wireless applications, and present different spectrum sharing models. Two resulting forms of cognitive radios - conventional and cooperative, are introduced. The first is based on a conventional way of looking at cognitive radios, where secondary access of spectrum is achieved with the constraint of limiting harmful interference to incumbent licensed systems. Under this model, we consider the problem of spectrum sensing and present some state-of-art approaches. The second model is based on cooperative cognitive radios, where secondary access is permitted under the constraint that a desired QoS metric of the licensed system is not adversely affected. Under this setting, we consider protocols based on cognition and cooperation for spectrum sharing with licensed systems. The tutorial will focus on fundamental concepts, present recent results in this area and outline potential research directions.

Speaker bio: Ashish Pandharipande received the B.E. degree in Electronics and Communications Engineering from Osmania University, in 1998, the M.S. degrees in Electrical & Computer Engineering and Mathematics, and the Ph.D. degree in Electrical and Computer Engineering from the University of Iowa, Iowa City, in 2000, 2001, and 2002, respectively. Since then, he has been a Postdoctoral Researcher at the University of Florida, and a Senior Researcher at Samsung Advanced Institute of Technology, Suwon, South Korea. He has held visiting positions at AT&T Laboratories, the Department of Electrical Communication Engineering, IISc, and Nanyang Technological University, Singapore. He is currently a Senior Scientist at Philips Research, Eindhoven, The Netherlands.

Ashish is a senior member of the IEEE. He is currently an editor of EURASIP JWCN and was a guest co-editor of a special issue on reconfigurable wireless systems in JWCN. He has organized special sessions on cognitive wireless networks in the past at PIMRC and MILCOM. He had served as secretary of the IEEE 802.22 working group on cognitive radio based regional area networks in 2005-2006. He was also the lead author of Samsung's system proposal to IEEE 802.22. His research interests are in the areas of cognitive wireless networks, sensor signal processing, multicarrier and MIMO wireless communications, and signal processing applications. He has more than 50 publications and 20 patent applications in these topics.

REGISTRATION FORM

**Cognitive Wireless Communications
Radar and Networks
8th January 2010 (9.30 to 17.30 hrs)**

- 1. Name:.....
- 2. Designation/Organisation
.....
- 3. Address for correspondence
.....
.....
.....
- 4. Email :.....
- 5. Educational Qualifications
.....

Signature of Applicant

Mr. Miss./ Mrs.
employed
is sponsored for the 'Cognitive Wireless
Communications and Radar Networks' Fee of
Rs.1000/2000 by D.D. No..... is
enclosed.

Place:

Date:

Signature of
Sponsoring authority with seal

(Xerox copies of the form can be used)