Non-linear Adaptive Signal Processing

Overview

The goal of nonlinear adaptive signal processing is to numerically model the behavior of non-linear adaptive systems with its characteristics. The classical theory of signal processing is based on models which are stationary, linear and in many cases also assume that signals have Gaussian amplitude distributions. In recent years there has been a rapid growth in the applications of signal processing in many modern areas of engineering, communications and computing, as well as in financial time series, macro-economics, the environmental and biological sciences, physiology, etc; parallel advances in the theory have introduced many new models and methods. Among these are nonlinear autoregressive and state-space models; models with time-varying or state-dependent coefficients as representations of nonstationary and nonlinear series; adaptive methods of forecasting, interpolation and smoothing; linear non-Gaussian methods, and methods derived from the theory of dynamical systems. Speech is basically used for the transmission of messages. The speech chain consists of message formulation, speech generation, speech transmission, speech recognition, and message understanding. The brain controls the time-varying vocal tract shapes for producing the intended sound sequences. This course is a thorough exploration for engineers and scientists of the foundational signal processing methods for interference suppression, detection, imaging and tracking that are at the core of most modern radar systems. It provides a solid base for studying advanced techniques, such as radar imaging, advanced waveforms, and adaptive processing in greater detail.

The course will cover: Basic theory of linear and non-linear signal processing, different design techniques and apply different fast algorithms for filtering, adaptive systems and its properties, speech production, speech perception, speech analysis in both time and frequency domain, speech synthesis and speech recognition. Introduction about radar theory, radar equation, Radar transmitters and receivers, Hyperbola system of navigation, Instrument landing system, Microwave landing systems, Satellite navigation systems. Apart from this, the course will cover current research on the applications of non-linear adaptive signal processing in communications, defense, and industry.

Modules	**A: Introduction to Signals and Spectral Analysis** **March 13, 2017** **B: Filter Design** **March 14, 2017** **C: Random process and Order Statistics Filter** **March 15, 2017** **D: Wavelet and Speech Signal Analysis** **March 16, 2017** **E: Radar Signal Processing** **March 17, 2017** **Exam of the course will be conducted on March 18, 2017** ***Number of participants for the course will be limited to fifty.*** ***All modules are compulsory to attend***
You Should Attend If…	▪ You are an executive, engineer and researcher from industry and government organizations, including R&D laboratories interested in learning/working signal processing. ▪ Youare a student at all levels (B.Tech/M.Sc/M.Tech/Ph.D) or Faculty from the reputed academic institutions interested in pursuing research in Signal Processing
Fees	The participation fees for taking the course is as follows: **Participants from abroad : US $300** **Industry/ Research Organizations: Rs. 5000/-** **Academic Institutions: Rs. 4000/- (Faculty) & Rs. 1,000/-(Student)** **(For SC/ST students 50% fee is waived)** The above fee includes all instructional materials, computer use for tutorials and assignments, laboratory equipment usage and Internet facility.

The Faculty

Prof. John J. Soraghan received the B.Eng. (Hons.) and M.Eng.Sc. degrees in electronic engineering from University College Dublin, Dublin, Ireland, in 1978 and 1983, respectively, and the Ph.D. degree in electronic engineering from the University of Southampton, Southampton, U.K., in 1989. His doctoral research focused on synthetic aperture radar processing on the distributed array processor. After graduating, he worked with the Electricity Supply Board in Ireland and with Westinghouse Electric Corporation in the U.S. In 1986, he joined the Department of Electronic and Electrical Engineering, University of Strathclyde, Glasgow, U.K., as a Lecturer, where he became a Senior Lecturer in 1990, a Reader in 2000, and a Professor of signal processing in September 2003, within the Institute for Communications and Signal Processing (ICSP). In December 2005, he became the Head of the ICSP. He currently holds the Texas Instruments Chair in Signal Processing with the University of Strathclyde. He was a Manager of the Scottish Transputer Centre from 1988 to 1991 and a Manager of the DTI Parallel Signal Processing Centre from 1991 to 1995. His main research interests are signal processing theories, algorithms, and architectures with applications to remote sensing, telecommunications, biomedicine, and condition monitoring.

Dr. Soraghan has elected Member of the IEEE Signal Processing in Education Technical Committee, organizer for 3rd European DSP Education and Research Conference. He has appointed the Texas Instruments Chair in Signal Processing. He was the external Examiner for the MSc Course in Communications and Signal Processing in the Dept. EEE, University of Edinburgh 2009 -2012. Also he was external Examiner for the MSc Courses in the Dept. EEE, University of Glasgow 2009 -2012.

Dr. Badri Narayan Subudhi is an Assistant Professor in the department of Electronics and Communication Engineering, at National Institute of Technology Goa since July 2014. His research interests include Image and Video Analysis, Medical Image Analysis, Pattern Recognition, and Remotely Sensed Image Analysis.

Dr. T. Veerakumar is working as an Assistant Professor in the Department of Electronics and Communication Engineering, National Institute of Technology Goa, India. His research interests include Signal Compression, Image Denoising, Medical Image Analysis and Video Processing.

Location:

National Institute of Technology Goa
Farmagudi, Ponda, Goa-403401, India

Course Duration:

One Week: March 13-18, 2017

Course Coordinators

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Course Registration Link:

http://www.gian.iitkgp.ac.in/GREGN
http://www.nitgoa.ac.in/gian/

A
6 Days Course
On

Non-linear Adaptive Signal Processing

(Under the aegis of MHRD- Global Initiative on Academic Network)

13-18 March 2017, at NIT Goa

Registration Form

GIAN portal Application Number_____

1. Name of the candidate:
2. Category : Academic / Industry /Student
3. Category of registration: SC/ ST/ General & OBC
4. Organization:
5. Address:
6. Mobile Number:
7. Email-id:
8. Highest academic qualification:
9. Bank Draft number: Date:
10. Amount : Drawn on:_____

_____ _____

Signature of the candidate Signature of the head of the Dept. / Institution

Note: Step-1: First register in GIAN portal, http://www.gian.iitkgp.ac.in/GREGN/index, get Application Number.

Step-2: Fill in this file. Take a print out of it. Get is signed by corresponding authority.

Step-3: Draw DD (amount specified in brochure) in favour of "**Director NIT Goa**" payable at Goa. and send the hard copy of this registration form with DD to**: Dr. Badri Narayan Subudhi, Assistant professor, Department of Electronics and Communication Engineering, National Institute of Technology Goa, Farmagudi, Ponda, Goa-403401**, Contact: +918322404204 (O)/ +918981744131 (M). Email: subudhi.badri@nitgoa.ac.in/tveerakumar@nitgoa.ac.in