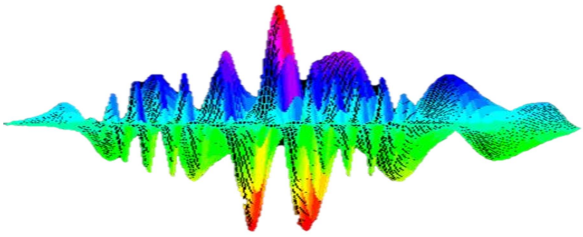
FACULTY DEVELOPMENT PROGRAM ON RECENT TRENDS IN SIGNAL REPRESENTATION: A MULTIRATE APPROARCH

(Sponsored by AICTE)

06 - 17 November 2017

FDP Co-coordinator: Dr. S. L. Nalbalwar



Rapid development in Multirate Signal Processing is visible by innovative and exciting applications in fields of speech, audio & signal processing, multi-carrier transmission systems and almost all the other fields alike.

- It is necessary to make teachers of engineering colleges and universities and people from industry aware of the opportunities and challenges in this field.
- Objectives of this FDP:
- To create awareness about the multirate signal processing and its importance over traditional signal processing
- To create awareness about the applications of multirate signal processing in signal compression, coding, analysis
- To promote research in the area of statistically matched multirate structure

- To enhance teachers' confidence level while teaching concepts of advanced signal processing
- To bridge the gap between industry and academia
- To serve as an induction programme for Ph. D researchers working in the area of signal processing
- To provide a forum for academicians, teachers and researchers to discuss emerging trends in aforementioned areas

A few assignments were mailed, well in advance, to all the participants to be submitted at the time of registration. Purpose of these assignments was to make the participants aware of the course content and brush up their knowledge of pre-requisites for the course. Assignments were mere prologue to what to come/expect in 12 days of programme.

Day 1, 6th November 2017

Inaugural function started at 10:00 am. FDP Coordinator Dr. S. L. Nalbalwar welcomed all the participants and gave a brief idea about programme and basic theme on which all the sessions would be carried out in the duration of programme. Hob'ble Vice Chancellor Dr. V. G. Gaikar greeted all the participants and gave his valuable thoughts on importance of such programmes. He congratulated Dr. S. L. Nalbalwar for arranging FDP and wished all present a good time ahead.

Two books, one authored by Dr. S. L. Nalbalwar and another authored by Dr. B. R. Iyer, Assistant Professor, Department of Electronics and Telecommunication Engineering, were inaugurated/ launched/ released by Hob'ble Vice Chancellor Dr. V. G. Gaikar.

This was followed by vote of thanks by Dr. B. R. Iyer.

Keynote was delivered by Dr. M. S. Sutaone, Head, Department of Electronics and Tele-Communication Engineering, CoE, Pune. Theme of his speech was **Wavelet Transform**, which was essentially in line with subject of FDP, viz. Recent Trends in Signal Representation: A Multirate Approach.

Day was concluded after a session conducted by Mr. Dheeraj Dhondalkar, Founder and CEO of EtaServe Software solutions Pvt. Limited, Bangalore on Embedded System Testing.

Day 2, 7th November 2017

Day 2 started with sessions by Dr. S. L. Nalbalwar, on **Linear Algebra For signal processing and fundamentals of Multirate Systems**. These sessions were particularly aimed at covering basic aspects required to further dwell in Multirate Digital Signal Processing realm.

Post-lunch session was conducted by Dr. Hemprasad Y. Patil, reviewer to Elsevier and Springer Journals, on **Introduction to MATLAB for Signal Processing**.

Day 2 was concluded after a session by Dr. P. K. Bhramankar, Professor, Mechanical Engineering department, Dr. Babasaheb Ambedkar Technological University, Lonere on **Pedagogical Practices: Some New Perspective**.

Day 3, 8th November 2017

On day 3, Dr. S. L. Nalbalwar delivered lectures on **Polyphase Representation of Filter Banks and Linear Prediction and Processes Modeling**.

Post-lunch Lab Sessions were supervised by Dr. Hemprasad Y. Patil. All the participants got hands-on experience on **MATLAB for Signal Processing** in these two sessions.

Day 4, 9th November 2017

On day 4, Dr. S. L. Nalbalwar engaged morning sessions to make participants acquainted with **Vector Space Representation of Filter Bank**.

In the afternoon sessions, Dr. S. L. Nalbalwar explained **Signal Matched Filter Bank and Generation of AR, MA, and ARMA processes**.

Day 5, 10th November 2017

In the morning sessions, Dr. A. P. Shesh, Head, English Department elaborated **The Unique Challenges in Learning Academic Languages** and emphasized on the importance of **Technical Communication Skills** in the field of academics. It was a refreshing experience for the participants and they participated in group activities asked to complete in the session by Dr. Shesh.

Dr. S. L. Nalbalwar covered all the possible **nitty-gritty of implementation of Signal Matched Filter Bank** in the afternoon sessions.

Day 6, 11th November 2017

The first week was concluded by the field Visit to Reliance Jio, Navi Mumbai.

This field visit was organized by EXTC department of DBATU Lonere, for various faculties from various institutes all over the state participated in faculty development program. The main objective behind this visit was to get exposure about different applications of multi-rate signal processing in industry.

The field visit was commenced by visiting to Jio Experience center where there were different Jio apps like JIO4G VOICE, JIOMAGS, JIOXPRESSNEWS, JIOCHAT, JIOCINEMA, JIOMUSIC, JIOMONEY, JIOSECURITY etc. Then Dr.

Munir Sayyad, General Manager of Jio Innovation lab shared his past experiences and explained the need of multi-rate in industry and emphasized on the need of academicians in industry and with the aid of academicians (M. Tech & Research Scholars) how we can create innovative things.

Then we visited server room where they stored the data. Finally we reached in NOC (National operation center) center where there were large screens and data traffics along with ticket raised by customers from various states were seen & how NOC team was working there to resolve the tickets. In NOC center, Mr. Raja Talwar, Head NOC has guided us about the working of that center.

Day 7, 12th November 2017

It was a much needed rest day for the participants not only to rejuvenate themselves for second week of FDP but also to complete all the assignments, if not submitted, given on each day in first week of programme. Assignments were given every day to test the understanding of participants on completed topics. These assignments elicited the participants to actively get involved in all the sessions and get their queries answered and solved.

Day 8, 13th November 2017

The second week of the programme Started with a talk on **Auditory Signal Processing using Multi-resolution Approach** by Dr. Abhijeet Karmarkar Senior Principal Scientist, CSIR – Central Electronics Engineering Research Institute, Pilani, Rajasthan. This informative talk continued till the afternoon session.

The last session of the day was conducted by Dr. Arnab Das, Director of Maritime Research Centre, Indian Maritime Foundation, Pune, who explained **Under Water Signal Processing**.

Day 9, 14th November 2017

Dr. Arnab Das continued his talk on Under Water Signal Processing from where he left previous day. Remaining all sessions of the day were helmed by Dr. R. S. Holambe, Shri Guru Gobind Singh Institute of Engineering and Technology, Nanded. Topic of his presentation was **Signal Representation using Orthogonal Transform.**

Day 10, 15th November 2017

Day 10 started with sessions by Dr. Sanjeev Kubakaddi, Founder of ITIE Knowledge Solutions, Bangalore on **Contextual Understanding of Biomedical Signal Processing (BSP)**.

In his last session of the programme, Dr. S. L. Nalbalwar addressed **different aspects of filter banks**.

Day concluded with a Lab Session by Dr. Sanjeev Kubakaddi with the demonstration on **ENOBIO**, a wireless and wearable brain monitoring device that record EEG.

Day 11, 16th November 2017

On day 11, Dr. Sanjeev Kubakaddi covered the remaining aspects of **BSP**.

A session for **Stress Management** was convened by Dr. A.B. Nandgoankar, faculty in Department of Electronics and Telecommunication Engineering. All the participants thoroughly enjoyed this session meant to negotiate with every day stress & reasons that render it and acquire some relaxation methods.

Day 12, 17th November 2017

Dr. B. R. Iyer delivered the morning session on **Research on Patent**, preceded by a Lab Session Prof. N. S. Jadhav on **EEG analysis**, Assistant Professor, Department of Electronics and Telecommunication Engineering.

A test was conducted for all the participants, based on all topics covered in this FDP.

Every participant gave feedback and talked about their experience in this course.

In the valedictory function, Dr. S. L. Nalbalwar congratulated all the participants for successfully completing Faculty Development Programme and thanked all involved in this programme for making it a success.

Hon'ble Vice-Chancellor of University Dr. V. G. Gaikar distributed the certificates to all the participants.

Total 30 theory sessions and eight lab sessions of one and half hour each were conducted making this course of 57 hours. All the course material was provided to all the participants in a Pen-drive.


Faculty Development Programme on
Signal Representation & Multirate Approach
6th-17th November 2017


A two week
AICTE Sponsored FDP on
Recent Trends in
06 - 17 November, 2017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