



**NALLA NARASIMHA REDDY**

Education Society's Group of Institutions - Integrated Campus

(UGC AUTONOMOUS INSTITUTION)



School of Engineering

Department of Electronics and Communication Engineering

Date: 08-04-2024

Report

on

Guest Lecture: "SIGNAL PROCESSING"

### Overview of Program

The Department organized a Guest Lecture on "Signal Processing" by Dr. P. Anil Kumar, Director – Management Services & Scientist-F, Research Centre Imarat (RCI), DRDO. The lecture focused on the fundamentals of signal processing and its applications in defence, communication, healthcare, radar systems, and intelligent electronic systems.

| Date Organized | Title of Program    | Name of Resource Person                                                    | Participants                                              |
|----------------|---------------------|----------------------------------------------------------------------------|-----------------------------------------------------------|
| 04-04-2024     | "SIGNAL PROCESSING" | Dr P Anil Kumar, Director – Management Services & Scientist-F, R.C.I. DRDO | B. Tech. ECE III-II (76 Students) and ECE faculty members |



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Department of Electronics and Communication Engineering

Organizes

Guest Lecture

on

**SIGNAL PROCESSING**



Dr. P. Anil Kumar

Date: 04-04-2024

Time: 11:00 AM

Venue: ECE Seminar Hall, S-21

## Purpose of Program

The programme aimed to provide students with a strong foundation in signal processing concepts and expose them to modern applications in engineering and defence technologies. It also encouraged students to explore research opportunities in digital signal processing and related domains.

## Program Highlights

### 1. Analog and Digital Signal Processing

The session began with an introduction to the fundamentals of analog and digital signal processing. Students learned about the differences between continuous-time and discrete-time signals and their significance in modern communication and electronic systems. The resource person explained how analog signals are converted into digital form for efficient processing, storage, and transmission. Through practical examples, students understood the advantages of digital signal processing in terms of accuracy, flexibility, and noise immunity, which are essential for the design of advanced electronic systems.

### 2. Fourier Transform and Fast Fourier Transform (FFT)

Students gained a comprehensive understanding of the Fourier Transform and Fast Fourier Transform (FFT), which are fundamental tools for analyzing signals in the frequency domain. The speaker explained how complex time-domain signals can be represented as a combination of sinusoidal components, enabling engineers to study signal characteristics more effectively. Practical demonstrations illustrated the computational efficiency of FFT in reducing processing time, helping students appreciate its importance in communication systems, audio processing, biomedical applications, and spectrum analysis.

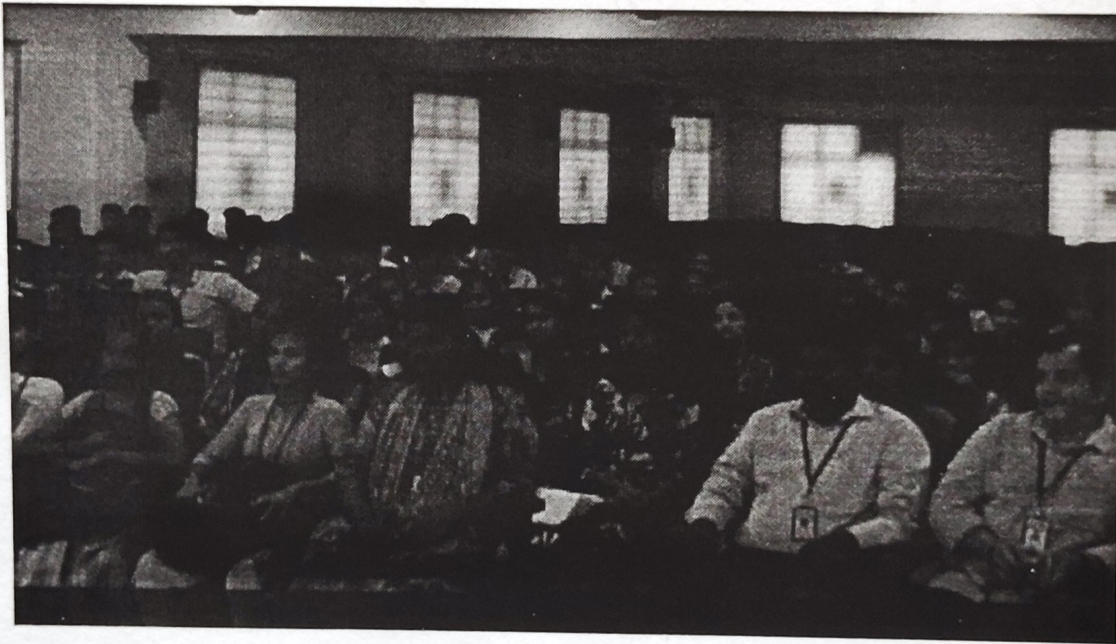


### 3. Digital Filtering Techniques

The resource person introduced various digital filtering techniques used to improve signal quality by removing unwanted noise and interference. Students learned about Finite Impulse Response (FIR) and Infinite Impulse Response (IIR) filters, their characteristics, and practical applications. The lecture emphasized the role of digital filters in enhancing the performance of communication systems, audio processing, medical equipment, and industrial automation. These discussions enabled students to understand the importance of filter design in achieving reliable and efficient signal processing.

### 4. Signal Processing Applications in Radar and Communication

Students were exposed to the real-world applications of signal processing in radar systems, wireless communication, satellite communication, and defence technologies. The resource person explained how advanced signal processing algorithms are employed for target detection, signal enhancement, noise reduction, and secure communication. Several examples from defence research and communication engineering were presented, allowing students to relate theoretical concepts to practical applications and understand the growing demand for signal processing technologies in modern engineering.



### 5. Career Guidance in Digital Signal Processing and Defence Research

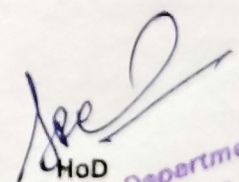
The lecture concluded with an informative session on career opportunities in Digital Signal Processing (DSP), communication engineering, embedded systems, and defence research organizations. Students actively participated in the interaction by seeking guidance on higher education, research opportunities, internships, and employment prospects in organizations such as DRDO, ISRO, BEL, and semiconductor industries. The resource person encouraged students to strengthen their knowledge of mathematics, programming, signal processing algorithms, and simulation tools to build successful careers in research, development, and advanced engineering technologies.



### Outcome of Program

Students developed a better understanding of signal processing concepts and their applications in engineering systems. The session enhanced their analytical skills and created awareness of research and career opportunities in DSP.

| Guest Lecture                     | Mapped POs & PSOs                         | Mapped SDGs                                                                                                           |
|-----------------------------------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Signal Processing<br>(04-04-2024) | PO1, PO2, PO3, PO5,<br>PO12<br>PSO1, PSO2 | SDG 3: Good Health and<br>Well-being<br>SDG 4: Quality Education<br>SDG 9: Industry, Innovation<br>and Infrastructure |

  
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