

G. PULLA REDDY ENGINEERING COLLEGE (Autonomous): Kurnool DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING



Report on

Five Day Online National Level FDP

on

"Applications of Signal Processing and Computer Vision using MATLAB and Simulink"

Event Type	: National Level FDP				
Date / Duration	: 7^{th} to 11^{th} March 2022				
Resource Persons	 Mr. J. Prem Kumar, Product Manager, Capricot Technologies, Hyderabad. Dr. S. Nagaraja Rao, Professor & HoD, Dept. of ECE, GPREC. Dr. M.V.R. Vittal, Associate Professor, Dept. of ECE, GPREC. 				
Convenor	: Dr. G. Amjad Khan, Associate Professor				
Co-Convenor	: Dr. D. Lakshmi Chaitanya, Associate Professor,				
Target Audience	: Faculty and Research Scholars				
Total no of Participants	: 76				

ABOUT THE COLLEGE:

G. Pulla Reddy Engineering College is the brainchild of Late Sri G. Pulla Reddy, (popularly known as Sweets Pulla Reddy in A.P.) the renowned philanthropist and a great humanist. Established in 1984-85, it is one of the earliest private engineering colleges in Andhra Pradesh state. GPREC has been functioning as an autonomous institution since 2006. The college is being managed by G. Pulla Reddy Charities trust, Hyderabad. The trust was instituted by late Sri G. Pulla Reddy Garu in 1977 with the motto of rendering service to the society.

ABOUT THE DEPARTMENT:

The ECE dept. was established in the academic year 1984-85 with an intake of 40 and currently with 198 regular and 18 lateral entry students. The department is offering one post graduate programme with the specialization of VLSI Embedded systems with an intake of 18 students. With the idea of **"Disseminating Knowledge through Interaction"**, department has been organizing National Level Technical Symposiums/Workshops/FDPs for the past twelve years through the constant support and enthusiasm of the management, faculty, students, alumni and industry experts.

WHY MATLAB IS SO IMPORTANT:

Millions of engineers and scientists worldwide use MATLAB for a range of applications, in industry and academia, including deep learning and machine learning, signal processing and communications, image and video processing, control systems, test and measurement, computational finance, and computational biology. Engineers use MATLAB[®] and Simulink[®] product families to design and simulate signal and image processing systems and control systems by capturing algorithms and system models. Using MATLAB and Simulink you can: Analyze signals and explore algorithms.

Matlab provides you a huge number of toolboxes to plot graphs, visualize complex datasets. You can use Matlab to perform complex scientific calculations, it also lets you visualize and implement complex mathematical functions.

Electronics and Communication Engineering Department has organised a FDP on "Applications of Signal Processing and Computer Vision using MATLAB and Simulink" from 7th to 11th March 2022 in association with Capricot Technologies Pvt Ltd. Hyderabad.

The resource persons for this event are Mr. J. Prem Kumar, Product Manager, Capricot Technologies, Hyderabad, Dr. S. Nagaraja Rao, Professor & HoD of ECE and Dr. MVR. Vittal, Associate Professor, Dept. of ECE.

The FDP was hosted by Dr. S. Nagaraja Rao, Professor & HoD of ECE, Dr. K. Suresh Reddy, Prof & Dean of ECE. Convenor Dr. G. Amjad Khan, Associate Professor of ECE department and Co-convenor Dr. D. Lakshmi Chaitanya, Associate Professor.Dr.S.Nagaraja Rao addressed the participants, further extended a warm welcome to the gathering and emphasized on the importance of Matlab for Faculty and Research Scholars. Dr.G.Amjad Khan Convenor of the FDP addressed the gathering regarding the Five days Schedule of the FDP.

The FDP was organized for five days and the topics like Introduction to MATLAB programming, signal processing and image processing with MATLAB, adaptive signal processing etc. were discussed by the speakers in a detailed manner.



Inaugural of the FDP on 7th March 2022

The inaugural address was followed by introduction of Day-1 speaker Dr. MVR. Vittal, by Coordinator Dr. G. Amjad Khan, over 76 participants from various institutions took part in this FDP.

Day-1 (7th March 2022) :

Speaker: Dr. MVR. Vittal, Associate Professor, Dept. of ECE, GPREC

Topic: Introduction to MATLAB Programming

Dr. MVR. Vittal discussed regarding application of Matlab in academics, finance, health care, transportation etc. He demonstrated the generation of various signals like sinusoidal, Ramp, Square etc and also explained how to write a Matlab program to perform different operations on matrices. Also gave an overview on how to generate images in Matlab.



Dr. MVR. Vittal, Resource Person, Explaining the importance of Matlab.



Dr. MVR. Vittal, Resource Person, Explaining the program writing in editor of Matlab

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Dr. MVR. Vittal, Resource Person, Explaining how to perform basic operations in Matlab

Day-2(8th March 2022):

Speaker: Mr. J. Prem Kumar, Product Manager, Capricot Technologies, Hyderabad Topic: Signal Processing with MATLAB

Mr. J. Prem Kumar elaborated on the generation of audio signal, Filter design with Matlab, HDL code generation, DOA (Direction of Arrival) estimation along with live examples. He explained the filter design with Simulink and discussed in detail on how to set the parameters for a component in Simulink. He demonstrated the process of executing live Matlab examples. He gave an overview on how to access various resources of Matlab online and offline Matlab documentation from the tool.



Mr. J. Prem Kumar, Resource Person, Explaining how to read and write an audio signal



Mr. J. Prem Kumar, Resource Person, Explaining how to access different toolboxes in Matlab



Mr. J. Prem Kumar, Resource Person, Explaining how to use Simulink

Day-3 (9th March 2022):

Speaker: Mr. J. Prem Kumar, Product Manager, Capricot Technologies, Hyderabad Topic: Image Processing with MATLAB

Mr. J. Prem Kumar discussed how to extract and segment required features form an image. He explained the digital image enhancement process using Matlab. Also explained the design of a filter and its analysis. He demonstrated the process of executing live Matlab examples. He gave an overview on the applications of digital image processing in engineering.



Mr. J. Prem Kumar, Resource Person, Explaining image processing using Rubik's cube example



Mr. J. Prem Kumar, Resource Person, Explaining how the use of toolboxes for image processing



Mr. J. Prem Kumar, Resource Person, Explaining how to download various toolboxes

Day-4 (10th March 2022):

Speaker: Mr. J. Prem Kumar, Product Manager, Capricot Technologies, Hyderabad Topic: Computer Vision with MATLAB and Simulink

Mr. J. Prem Kumar discussed how to import the video files and view them. He explained the hardware integration of an USB camera to demonstrate the application of computer vision. Examples of computer vision are also explained in Simulink. He demonstrated the process of executing live Matlab examples. He gave an overview on the applications of computer vision in engineering.



Mr. J. Prem Kumar, Resource Person, Explaining computer vision example

Day-5 (11th March 2022):

Speaker: Dr. S. Nagaraja Rao, Professor & Head, Dept. of ECE, GPREC

Topic: Adaptive Signal Processing and its Applications

Dr. S. Nagaraja Rao discussed the need for adaptive signal processing algorithms like to handle the challenges arising due to problem of estimation and tracking of time-varying systems. He demonstrated the comparison of LMS and RLS algorithms, stating that the RLS approach offers faster convergence and smaller error with respect to the unknown system at the expense of requiring more computations. He explained the process of canceling maternal ECG to calculate fetal ECG using adaptive filters with block diagrams. Also discussed about the removal of ocular artifacts from EEG signals using adaptive filtering.



Dr. S. Nagaraja Rao, Resource Person, Explaining the need for adaptive signal processing algorithms



Dr. S. Nagaraja Rao, Resource Person, Explaining the difference between LMS and RLS algorithms



Dr. S. Nagaraja Rao, Resource Person, Explaining the importance of fetal ECG monitoring

FDP BROCHURE:

Dept. of ECE



No Registration fee

CHAIRMAN

Sri P. Subba Reddy, Chairman

CHIEF PATRON

Dr. B. Sreenivasa Reddy, Principal

PATRONS

Dr. S. Nagaraja Rao, Professor & Head of ECE Dr. K. Suresh Reddy, Professor & Dean of ECE

CONVENER

Dr. G. Amjad Khan, Associate Professor of ECE

CO-CONVENER

Dr. D. Lakshmi chaitanya, Associate Professor of ECE

ADVISORY COMMITTEE

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- Dr. S. Saheb Basha, Professor of ECE
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- Dr. S.M. Shamsheer Daula, Associate Professor of ECE
 - Dr. G. Ramesh, Assistant Professor of ECE

ORGANISING COMMITTEE

Dr. Salai Thillai Thilagam, Associate Professor of ECE

- Dr. S. Vyshali, Associate Professor of ECE
- Sri. M. Madhusudan Reddy, Assistant professor of ECE

Smt. G. Divya Praneetha, Assistant Professor of ECE



Notification of FDP in the GPREC Website

FDP was highly informative in current scenario. Participants were enlightened with the most widely used advanced technologies in this domain. The FDP ended with Questionnaire session followed by vote of thanks. Feedback for the FDP was also collected.

Feedback / Suggestions:

- 1. It was very useful and effective session.
- 2. Mathworks explanation with overview was nice .
- 3. RGB Calculation, IM Tool, Plane examples are very useful.
- 4. Different research aspects in DSP were covered.

FEEDBACK IMAGES:





OVERALL FEEDBACK ABOUT THE SESSION

95 responses



CONTENT DELIVERED BY RESOURCE PERSON : Mr.J.Prem kumar

114 responses



Co-Convenor

Dr. D. Lakshmi Chaitanya Associate Professor Dept of ECE GPREC(A),Kurnool

Convenor

Dr.G.Amjad Khan Associate Professor Dept of ECE GPREC(A),Kurnool

HOD ECE

Dr.S.Nagaraja Rao Professor& HOD ECE Dept of ECE GPREC(A),Kurnool