D.N.R COLLEGE OF ENGINEERING & TECHNOLOGY
Department of Electronics and Communication Engineering
Academic Year: 2020- 2021 (Odd Semester)
Innovative Teaching Method

B-Tech, Semester& Branch: IV/ I Semester ECE

Title: Digital Image Processing

Name of the Faculty member: Dr. N.Venkata Rao

Name of the Topic Spatial and Frequency domain Filtering

Name of the Innovative Practice: MATLAB Simulation

Date& Duration: 27.07.2020 & 30 Minutes

Description:

MATLAB is one of the most popular fourth-generation programming languages in the world. It is one of the best numerical analysis environments. MATLAB is also the most powerful and high-performance language that is used in technical computing. It is built to solve the problems which use mathematics notations. Use of black-boards or the typical lecture methods are not adequate to teach science and other related subjects. The evolution of a process can be conveyed better with simulation. It helps to promote creativity and motivate the students to do projects using MATLAB Software.

```matlab
grayImage = imread('peppers.png');
% Get the dimensions of the image.
% numberOfColorBands should be = 1.
[rows, columns, numberOfColorBands] = size(grayImage);
if numberOfColorBands > 1
    % It's not really gray scale like we expected - it's color.
    % Convert it to gray scale by taking only the green channel.
    grayImage = grayImage(:, :, 2); % Take green channel.
end
% Display the original gray scale image.
subplot(2, 1, 1);
imshow(grayImage, []);
fontSize = 20;
title('Original Grayscale Image', 'FontSize', fontSize, 'Interpreter', 'None');

% Set up figure properties:
% Enlarge figure to full screen.
set(gcf, 'Units', 'Normalized', 'OuterPosition', [0 0 1 1]);
% Get rid of tool bar and pulldown menus that are along top of figure.
set(gcf, 'Toolbar', 'none', 'Menu', 'none');
% Give a name to the title bar.
set(gcf, 'Name', 'Demo by ImageAnalyst', 'NumberTitle', 'Off')

% Display the original gray scale image.
subplot(2, 1, 2);
F=fft2(grayImage);
S=fftshift(log(1+abs(F)));
imshow(S,[]);
title('Spectrum Image', 'FontSize', fontSize, 'Interpreter', 'None');
```

Original Grayscale Image

Spectrum Image
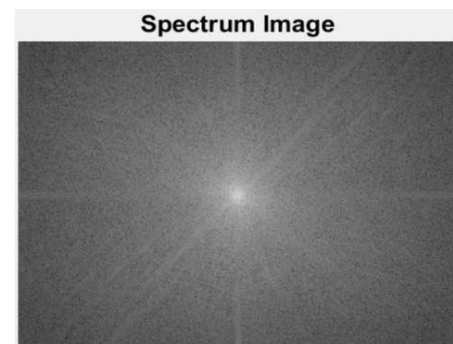
Reference:

1.Anil K.Jain, "Fundamentals of Digital Image Processing", Prentice Hall of India, 9th Edition, Indian Reprint,
2002.

2. B.Chanda, D.Dutta Majumder, "Digital Image Processing and Analysis", PHI, 2009.

B-Tech, Semester& Branch: II/ II Semester ECE
Title: Electronic Circuit Analysis
Name of the Faculty member: Dr. N.Venkata Rao
Name of the Topic: High frequency analysis of CE amplifier
Name of the Innovative Practice: Collaborative Learning
Date& Duration: 19.01.2021 & 40Minutes

Justification:

Collaborative learning is an educational approach to teaching and learning that involves groups of students working together to solve a problem, complete a task. Used to analyze the High frequency analysis of CE amplifier. Students must understand the concept of high frequency analysis and its importance.

Details of the Implementation:

First split the students into groups and ask them to sit as a group. The topic is divided into sub topics and each group of students allotted for sub topics. Students were asked to prepare the topic prior. They discussed within their group about the topic and present about the common Emitter amplifier and its high frequency analysis.

Reflective Critique:

❖ *Feedback of practice from students and other stakeholders:*
Students stated that they appreciated the activity and that it helped them remember topics and content when writing assessments.

❖ ***Benefit of the practice:*** (E.g.: Outcome attainment would have increased due to innovative practice over conventional practice)

The Students eagerly participated in that activity and then they acquired the concept of High frequency analysis of CE amplifier. Due to this activity, the students were able to recall the topic and remember the important terms easily.

❖ ***Challenges faced in implementation:***

I have planned this activity for 40 minutes. Students take some time to forming the group. After formed the group, they discussed the topic. Students asked doubts regarding the topic before presentation. I've given a brief overview of the amplifier. I encouraged the students which it takes another 5 minutes for completing the activity.

References:
1.Electronic Circuit Analysis and Design – Donald A. Neaman, Mc Graw Hill.
2. Electronic Devices and Circuits Theory – Robert L. Boylestad and Louis Nashelsky, Pearson/Prentice Hall,
Tenth Edition.
3. Electronic Circuit Analysis-B.V.Rao,K.R.Rajeswari, P.C.R.Pantulu,K.B.R.Murthy, Pearson Publications.

4. Microelectronic Circuits-Sedra A.S. and K.C. Smith, Oxford University Press, Sixth Edition.