BODE PLOTS

MATLAB Control System Toolbox

Understanding Bode Plots, Part 2: What Are They?

33,753 views •Apr 9, 2013 5:16

https://www.youtube.com/watch?v=COzQwkeu8Ek

Analyze and design control systems in the frequency domain

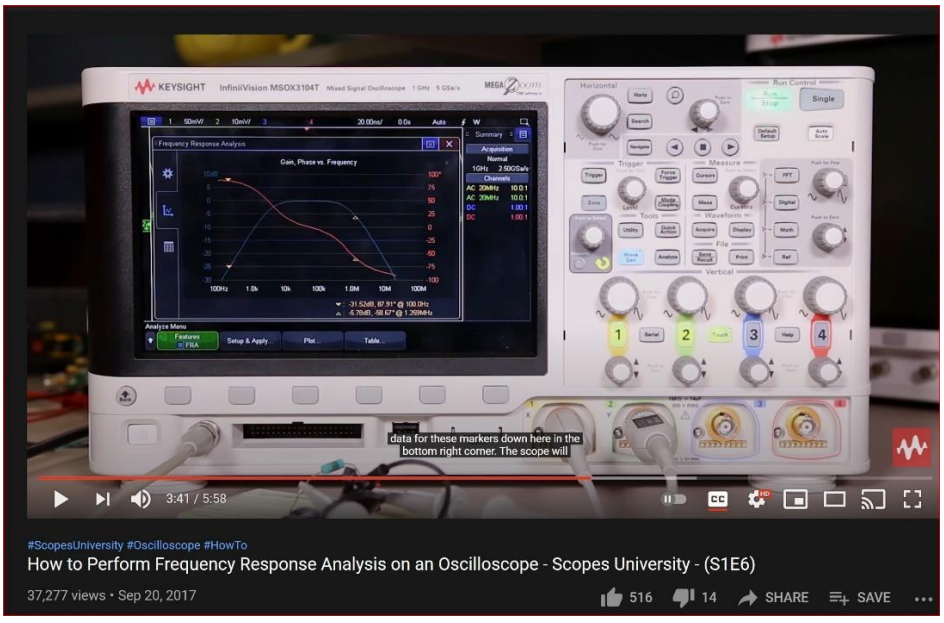
The Bode plot is named for its inventor, Hendrick Bode, an American engineer who worked at Bell Labs. It graphs the frequency response of a linear time-invariant (LTI) system. Both the amplitude and phase of the LTI system are plotted against the frequency. A logarithmic scale is used for frequency, as well as amplitude, which is measured in decibels (dB).

How to Perform Frequency Response Analysis on an Oscilloscope - Scopes University - (S1E6)

37,197 views •Sep 20, 2017 5:58

https://www.youtube.com/watch?v=ADmVAs6vqLU

Frequency Response Analysis and Bode plots. Click to subscribe: http://bit.ly/Scopes_Sub Learn more about Frequency Response Analysis ► http://bit.ly/ScopesUniversity ◄ In this episode of Scopes University, we will learn how to do Frequency Response Analysis, or FRA, on an oscilloscope. This Keysight exclusive application enables you to characterize your device using a Bode plot right on the screen of the oscilloscope. You will gain an understanding of why Frequency Response Analysis is important for amplifiers, power supplies, filters, audio systems, etc. Doing this further characterization gives you more insight into whether your device is operating correctly. In this exercise, we use a basic band pass filter to learn how to set up a Bode plot using an oscilloscope.



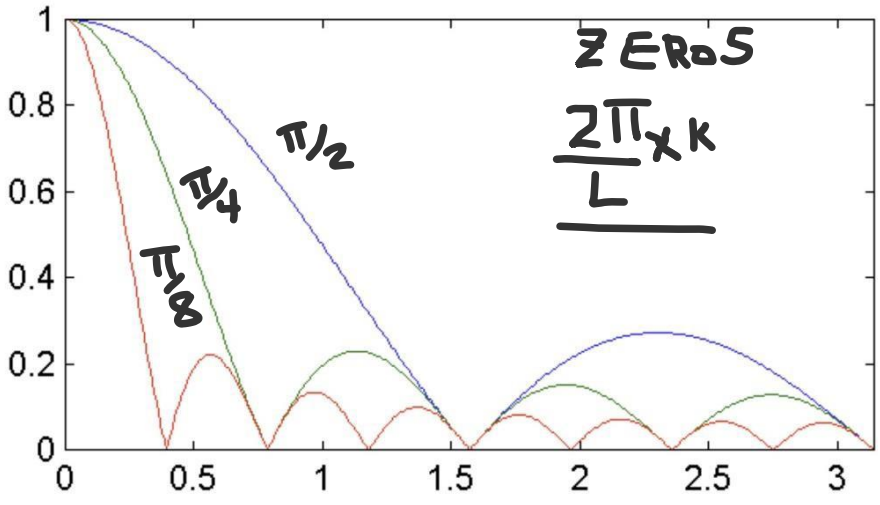
Digital Frequency

Frequency Response of the Running Average Filter

https://ptolemy.berkeley.edu/eecs20/week12/freqResponseRA.html

$$H(\omega) = (1/L)\,(1 - e^{-j\omega L})/(1 - e^{-j\omega}).$$

where we have let $a = e^{-j\omega}$, $N = 0$, and $M = L - 1$. We may be interested in the magnitude of this function in order to determine which frequencies get through the filter unattenuated and which are attenuated. Below is a plot of the magnitude of this function for $L = 4$ (red), 8 (green), and 16 (blue). The horizontal axis ranges from zero to π radians per sample.



DSPF Page 215 Zeros of Dl(w_hat) – sin(w_hat L/2) at w_hat = 2pi/L. L= 4 (pi/2) L=8 (pi/4, pi/2, 3pi/4)

Introduction to Bode Plots

3,869 views •Apr 24, 2019

https://www.youtube.com/watch?v=KX7GNqy3k7w

IN THIS VIDEO WE INTRODUCE THE CONCEPT OF BODE PLOTS INCLUDING WHAT THEY REPRESENT, HOW THEY ARE GENERATED, AS WELL AS HOW TO USE MATLAB TOOLS TO WORK WITH BODE PLOTS. TOPICS AND TIME STAMPS: 1:19 – INTRODUCTION 5:29 – DEFINING A BODE PLOT 8:42 – DEMONSTRATION WITH A REAL MASS, SPRING, DAMPER SYSTEM 20:58 – DEFINITION OF DECIBELS 30:31 – WORKFLOW TO GENERATE A BODE PLOT 32:34 – MANUALLY CREATING A BODE PLOT IN MATLAB 39:04 – USING MATLAB'S 'BODE' COMMAND ADDITIONAL VIDEOS IN THIS SERIES: -FREQUENCY DOMAIN ANALYSIS: INTRODUCTION AND THEORY (TBD) -INTRODUCTION TO BODE PLOTS (HTTPS://YOUTU.BE/KX7GNQY3K7W) -RESONANT FREQUENCY OF A DYNAMIC SYSTEM (HTTPS://YOUTU.BE/0ZUP07XP--A) -UNDERSTANDING AND SKETCHING INDIVIDUAL BODE PLOT COMPONENTS

(https://youtu.be/aoFakXGYOH0) -Bode Plots of Complex Transfer Functions (https://youtu.be/cBMgRWOzLnw)

Bode Plots for Feedback Loops

Understanding Bode Plots

3,782 views •Jun 11, 2020 8:34

For Control Applications

https://www.youtube.com/watch?v=Ez1sZ2qtGJs

MATLAB Documentation

https://www.mathworks.com/discovery/bode-plot.html