3315 Videos April 2021

1. Examples of Using DFT to Compute Spectra

Barry Van Veen 5:05 Sunspots, etc. 11 Year cycle using DFT

Computing spectra of sunspot activity and a loon call using the DFT.

https://www.youtube.com/watch?v=M2Sby-oZGFI

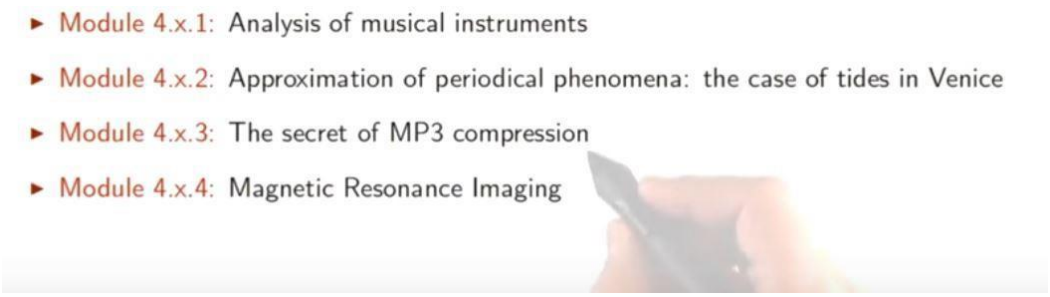
http://AllSignalProcessing.com for more great signal-processing content: ad-free videos, concept/screenshot files, quizzes, MATLAB and data files.

2. *Free Engineering Lectures*

Why the DFT is useful A few examples | Digital Signal Processing

1,025 views •Aug 23, 2014 18:54 4.x

https://www.youtube.com/watch?v=XjAN7iNMvzI&list=PL8OKZ0YYvdEvyhMsn3th1ESiyEG9gV45h&index=10



Exploration via a change of basis | Digital Signal Processing

671 views •Aug 23, 2014 4.1

https://www.youtube.com/watch?v=GBdT5Z-Hw8g&list=PL8OKZ0YYvdEvyhMsn3th1ESiyEG9gV45h&index=7

The DFT in practice | Digital Signal Processing

1,250 views •Aug 23, 2014 20.27 Module 4.3

https://www.youtube.com/watch?v=Nbq7BSaus6c&list=PL8OKZ0YYvdEvyhMsn3th1ESiyEG9gV45h&index=8

Watch until 17:25: Notice sunspots, daily temperature, train whistle, and periodic nature of DFT.

Discrete Fourier Transform - Simple Step by Step

639,130 views •Aug 3, 2015 10:34 Simon Xu

https://www.youtube.com/watch?v=mkGsMWi_j4Q

Easy explanation of the Fourier transform and the Discrete Fourier transform, which takes any signal measured in time and extracts the frequencies in that signal.

He takes 8 samples of a 1 Hz sine wave 1sin(2π1t) – so N=8, Ts=1/8 sec, NTs= 8(1/8) = 1 Hz. We expect frequencies spaces at 1Hz apart. In the result we might we expect

Fk = { 0, 1, 0 , 0, 0, 0, 0, 0} but the DFT yields { 0, -4j, 0 , 0, 0, 0, 0, 4j} AS EXPECTED.

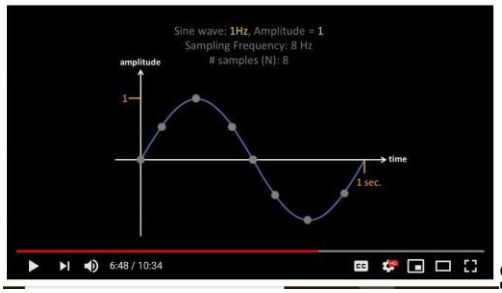
However – Fmax is 4 Hz because the sampling rate is 8 s/s, so the 4j term is the negative 1 Hz frequency. Combining as a sine result with inverse Euler, we have

Fk1 = { 0, 8, 0, 0, 0} from 0 to 4 Hz. The j in the DFT indicates a pi/2 phase shift.

To get the correct amplitude, we divide by N or

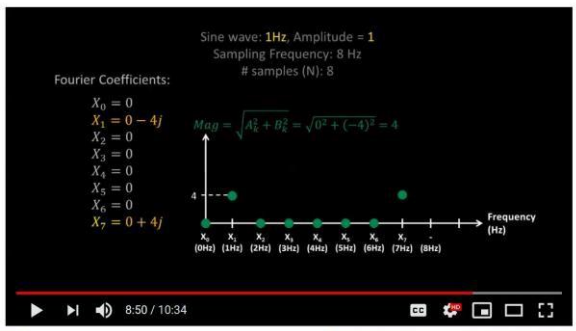
Fcorrect = (1/N) Fk1 = {0, 1, 0, 0} So this is a 1 Hz sine wave – Note as cosine we write

F(t) = 1 cos(2pi t + pi/2) = 1 sin(2pi t) as expected.



Sample a sine wave for 1 sec

8 points, spaces 1/8 sec apart NTs = 1 Hz



Show DFT – Valid only to 4 Hz

Image processing | Digital Signal Processing 17:03

https://www.youtube.com/watch?v=8pr-yrlXnmQ

A series of lectures using Fourier techniques for compressions – JPEG, etc.

FFT “the most important numerical algorithm of our lifetime”

1. FFT basic concepts

https://www.youtube.com/watch?v=z7X6jgFnB6Y

Basic concepts related to the FFT (Fast Fourier Transform) including sampling interval, sampling frequency, bidirectional bandwidth, array indexing, frequency bin width, and Nyquist frequency. 7:26

Note: He uses fs as the sampling rate. dF = 1/(NTs)

2 Applications of the (Fast) Fourier Transform (ft. Michael Kapralov)

59,366 views •Mar 30, 2017 12:31

This video presents 3 applications of the Fast Fourier Transform (FFT) and hints at many more. Gilbert Strang described FFT as "the most important numerical algorithm of our lifetime". The video features Assistant Professor Michael Kapralov of the IC School at EPFL.

https://www.youtube.com/watch?v=aqa6vyGSdos

Learn about Fourier transforms, convolutions, neural networks, image processing, GPS, MRI scans, hearnin, etc, etc - Fourier does it all.

3.FFT Tutorial TI

598,640 views •May 17, 2012 6:29

Try it with a real scope:

Tony and Ian from Tektronix present a FFT Tutorial (Fast Fourier Transform) covering what is FFT, an explanation of the FFT function as well as different FFT applications. They explain how the FFT works with a FFT example and show an oscilloscope demo to demonstrate how helpful the FFT can be. 6:29

https://www.youtube.com/watch?v=zKKGA30bHG0&feature=youtu.be