

NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Electrical Engineering - NOC:Digital Signal Processing and its Applications

Subject Co-ordinator - Prof. V. M. Gadre

Co-ordinating Institute - IIT - Bombay

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction: Digital signal processing and its objectives
Lecture 2 - Introduction to sampling and Fourier Transform
Lecture 3 - Sampling of sine wave and associate complication
Lecture 4 - Review of Sampling Theorem
Lecture 5 - Idealized Sampling, Reconstruction
Lecture 6 - Filters And Discrete System
Lecture 7 - Answering questions from previous lectures
Lecture 8 - Desired requirements for discrete system
Lecture 9 - Introduction to phasors
Lecture 10 - Advantages of phasors in discrete systems
Lecture 11 - What do we want from a discrete system?
Lecture 12 - Linearity - Homogeneity and Additivity
Lecture 13 - Shift Invariance and Characterization of LTI systems
Lecture 14 - Characterization of LSI system using its impulse response
Lecture 15 - Introduction to convolution
Lecture 16 - Convolution: Deeper ideas and understanding
Lecture 17 - Characterisation of LSI systems, Convolution-properties
Lecture 18 - Response of LSI Systems to Complex Sinusoids
Lecture 19 - Convergence of Convolution and Bibo Stability
Lecture 20 - Commutativity and Associativity
Lecture 21 - BIBO Stability of an LSI system
Lecture 22 - Causality and memory of an LSI system
Lecture 23 - Frequency response of an LSI system
Lecture 24 - Introduction and conditions of Stability
Lecture 25 - Vectors and Inner Product
Lecture 26 - Interpretation of Frequency Response as Dot Product
Lecture 27 - Interpretation of Frequency Response as Eigenvalues
Lecture 28 - Discrete time fourier transform
Lecture 29 - DTFT in LSI System and Convolution Theorem.

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- Lecture 30 - Definitions of sequences and Properties of DTFT
- Lecture 31 - Introduction to DTFT, IDTFT
- Lecture 32 - Dual to convolution property
- Lecture 33 - Multiplication Property, Introduction to Parseval's theorem
- Lecture 34 - Introduction and Property of DTFT
- Lecture 35 - Review of Inverse DTFT
- Lecture 36 - Parseval's Theorem and energy and time spectral density
- Lecture 37 - Discussion on Unit Step
- Lecture 38 - Introduction to Z transform
- Lecture 39 - Example of Z transform
- Lecture 40 - Region of Convergence
- Lecture 41 - Properties of Z transform
- Lecture 42 - Z- Transform
- Lecture 43 - Rational System
- Lecture 44 - Introduction and Examples of Rational Z Transform and their Inverses
- Lecture 45 - Double Pole Examples and their Inverse Z Transform
- Lecture 46 - Partial Fraction Decomposition
- Lecture 47 - LSI System Examples
- Lecture 48 - Why are Rational Systems so important?
- Lecture 49 - Solving Linear constant coefficient difference equations which are valid over a finite range of
- Lecture 50 - Introduction to Resonance in Rational Systems
- Lecture 51 - Characterization of Rational LSI system
- Lecture 52 - Causality and stability of the ROC of the system function
- Lecture 53 - Recap of Rational Systems and Discrete Time Filters
- Lecture 54 - Specifications for Filter Design
- Lecture 55 - Four Ideal Piecewise Constant Filters
- Lecture 56 - Important Characteristics Of Ideal Filters
- Lecture 57 - Synthesis of Discrete Time Filters, Realizable specifications
- Lecture 58 - Realistic Specifications for low pass filter. Filter Design Process
- Lecture 59 - Introduction to Filter Design. Analog IIR Filter, FIR discrete-time filter, IIR discrete-time fil
- Lecture 60 - Analog to discrete transform
- Lecture 61 - Intuitive transforms, Bilinear Transformation
- Lecture 62 - Steps for IIR filter design
- Lecture 63 - Analog filter design using Butterworth Approximation
- Lecture 64 - Butterworth filter Derivation And Analysis of butterworth system function
- Lecture 65 - Chebychev filter Derivation
- Lecture 66 - Midsem paper review discussion
- Lecture 67 - The Chebyshev Approximation
- Lecture 68 - Next step in design: Obtain poles

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- Lecture 69 - Introduction to Frequency Transformations in the Analog Domain
- Lecture 70 - High pass transformation
- Lecture 71 - Band pass transformation
- Lecture 72 - Frequency Transformation
- Lecture 73 - Different types of filters
- Lecture 74 - Impulse invariant method and ideal impulse response
- Lecture 75 - Design of FIR of length $(2N+1)$ by the truncation method, Plotting the function $V(w)$
- Lecture 76 - IIR filter using rectangular window, IIR filter using triangular window
- Lecture 77 - Proof that frequency response of an fir filter using rectangular window function centred at 0 is
- Lecture 78 - Introduction to window functions
- Lecture 79 - Examples of window functions
- Lecture 80 - Explanation of Gibb's Phenomenon and its application
- Lecture 81 - Comparison of FIR And IIR Filter's
- Lecture 82 - Comparison of FIR And IIR Filter's
- Lecture 83 - Comparison of FIR And IIR Filter's
- Lecture 84 - Introduction and approach to realization (causal rational system)
- Lecture 85 - Comprehension of Signal Flow Graphs and Achievement of Pseudo Assembly Language Code
- Lecture 86 - Introduction to IIR Filter Realization and Cascade Structure
- Lecture 87 - Cascade Parallel Structure
- Lecture 88 - Lattice Structure
- Lecture 89 - Recap And Review of Lattice Structure, Realization of FIR Function
- Lecture 90 - Backward recursion, Change in the recursive equation of lattice
- Lecture 91 - Lattice structure for an arbitrary rational system
- Lecture 92 - Example realization of lattice structure for rational system
- Lecture 93 - Introductory Remarks of Discrete Fourier Transform and Frequency Domain Sampling
- Lecture 94 - Principle of Duality, The Circular Convolution