

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

NPTEL Video Course - Electrical Engineering - NOC:Nonlinear System Analysis

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Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Examples of Nonlinear Physical Systems
Lecture 2 - Math Preliminaries - Part 1
Lecture 3 - Math Preliminaries - Part 2
Lecture 4 - Math Preliminaries - Part 3
Lecture 5 - Lipschitz Continuity and Contraction Mapping Theorem - Part 1
Lecture 6 - Lipschitz Continuity and Contraction Mapping Theorem - Part 2
Lecture 7 - Lipschitz Continuity and Contraction Mapping Theorem - Part 3
Lecture 8 - Existence and Uniqueness Theorem of ODE - Part 1
Lecture 9 - Existence and Uniqueness Theorem of ODE - Part 2
Lecture 10 - Existence and Uniqueness Theorem of ODE - Part 3
Lecture 11 - Existence and Uniqueness Theorem of ODE - Part 4
Lecture 12 - Equilibrium Points
Lecture 13 - Phase Portrait - Part 1
Lecture 14 - Phase Portrait - Part 2
Lecture 15 - Phase Portrait - Part 3
Lecture 16 - Phase portrait of Nonlinear Systems
Lecture 17 - Limit Cycles
Lecture 18 - Limit Cycles - Examples - Part 1
Lecture 19 - Limit Cycles - Examples - Part 2
Lecture 20 - Introduction to Bifurcation Theory - 1
Lecture 21 - Introduction to Bifurcation Theory - 2
Lecture 22 - Necessary and Sufficient Conditions for Local Bifurcation
Lecture 23 - Problems on Bifurcation Theory.
Lecture 24 - Stability Notions
Lecture 25 - Stability Notions
Lecture 26 - Stability Notions
Lecture 27 - Stability Notions
Lecture 28 - Stability Analysis and types of stability
Lecture 29 - Lypaunov Stability

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- Lecture 30 - Supplementary lecture
- Lecture 31 - Center Manifold Theorem
- Lecture 32 - Interconnection between non linearity and a linear system - Sector Nonlinearities And Aizermannâ s conjecture
- Lecture 33 - Counter example for Aizermannâ s conjecture
- Lecture 34 - Passivity inspiration - passive circuits - dissipation equality
- Lecture 35 - Dissipative Equality for circuit (Continued...)
- Lecture 36 - PR condition for passivity of SISO system
- Lecture 37 - Examples of PR transfer functions
- Lecture 38 - Relation between storage function and Lyapunov function - PR Lemma
- Lecture 39 - Proof of PR Lemma
- Lecture 40 - Proof (Continued...) using spectral factorization theorem
- Lecture 41 - PR definition for MIMO case
- Lecture 42 - PSD Storage function in PR Lemma and how to make it PD (strictly PR)
- Lecture 43 - KYP Theorem
- Lecture 44 - Passivity preservation under interconnection
- Lecture 45 - Aizermannâ s conjecture under passivity assumption is true
- Lecture 46 - Sector Nonlinearities and need for generalizing KYP Lemma
- Lecture 47 - Need for Loop transformations
- Lecture 48 - Loop Transformations - Part 1
- Lecture 49 - Loop Transformations - Part 2
- Lecture 50 - Circle criterion for PR
- Lecture 51 - Examples based on circle criterion and stability under circle transformations