NPTEL Video Course - Electrical Engineering - NOC:Sliding Mode Control and Applications

Subject Co-ordinator - Prof. Shyam Kamal

Co-ordinating Institute - IIT (BHU) Varanasi

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

Lecture 1 - A Transition from PID to Nonsmooth PID
Lecture 2 - Newton's Law - Inspired Tuning of P controller - 1
Lecture 3 - Newton's Law - Inspired Tuning of PI Controllers - 2
Lecture 4 - Tuning of PID and High Gain Controllers
Lecture 5 - Newton's Inspired Tuning of ON OFF Controller - 1
Lecture 6 - Finite - Time Stability Using a Lyapunov Function
Lecture 7 - Sliding Mode Control for Nonlinear Systems
Lecture 8 - Regular Form Representation of Npnlinear Systems - Part I
Lecture 9 - Regular Form Representation of Npnlinear Systems - Part II
Lecture 10 - A Regular Form Approach to Sliding Mode Control of Nonlinear System
Lecture 11 - Input Output Linearization - Part I
Lecture 12 - Input Output Linearization - Part II
Lecture 13 - Tracing Problem based on Sliding Mode Control for Nonlinear Systems
Lecture 14 - State Feedback Unit Vector Control
Lecture 15 - Output Based Hyperplane Design in Sliding Mode Control
Lecture 16 - Terminal Sliding Mode Control
Lecture 17 - Integral Sliding Mode Control
Lecture 18 - Integral Sliding Mode Control Design in Presence of Unmatched Pertubations
Lecture 19 - Robot Control
Lecture 20 - Control of Robot manipulators using Integral Sliding Mode Control
Lecture 21 - Observer Design in Control Theory
Lecture 22 - Observer Design for Nonlinear systems
Lecture 23 - High Gain Observer for Nonlinear Systems
Lecture 24 - Sliding Mode Observer Design
Lecture 25 - Sliding Mode Observer Design for Nonlinear Systems Application to Fault Estimation
Lecture 26 - Observer for Linear Systems with Binary Output
Lecture 27 - Application of Sliding Mode Observer in DC Motor Control
Lecture 28 - Chattering Analysis
Lecture 29 - Chattering Suppression via Boundary Layers and Observer Design

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Lecture 30 - Hybrid Chattering Suppression Approach
Lecture 31 - Solution of Differential Equations with eDiscontinuous Right Hand Sides
Lecture 32 - Higher Order Sliding Mode Control Concepts and Definitions
Lecture 33 - Homogeneity and Stability of Differential Inclusion
Lecture 34 - Finite Time Stability and Accuracy of Differential Inclusion
Lecture 35 - Twisting Algorithm
Lecture 36 - Lyapunov Analysis of Twisting Algorithm - 1
Lecture 37 - Lyapunov Analysis of Super Twisting Algorithm - 1
Lecture 38 - Geometrical Proof of Convergence of Super Twisting Algorithm
Lecture 39 - Continuous Integral Sliding Mode Control - 1
Lecture 40 - Continuous Terminal Sliding Mode Control - 1
Lecture 41 - Homogeneous Sliding Modes
Lecture 42 - Higher Order Super Twisting Algorithm
Lecture 43 - An Introduction to Differentiator Design
Lecture 44 - First Order Differentiator and Output Feedback Control Based on Sliding Mode
Lecture 45 - Arbitrary Order Robust Exact Differentiation
Lecture 46 - How to Implement Super Twisting Controller Based on Sliding Mode Observer
Lecture 47 - Parameter Identification Using Sliding Mode Control
Lecture 48 - Robust Finite Time Continuous Super Twisting Controller Design for MIMO Systems
Lecture 49 - Adaptive Sliding Mode Control
Lecture 50 - Adaptive Sliding Mode Control for Industrial Emulator
Lecture 51 - Stability Notions for Dicrete Time Systems
Lecture 52 - Discrete Sliding Mode Control
Lecture 53 - Minimum Operator Based Discrete Sliding Mode
Lecture 54 - Difference Equation with Minima Based Discrete Time Twisting and Super Twisting Like Algori
Lecture 55 - Multirate Output Feedback Based Discrete Sliding Mode
Lecture 56 - An Introduction to Arbitrary Time Stability
Lecture 57 - Arbitrary Time Terminal Sliding Mode Control
Lecture 58 - Stabilization of Continuous Time Uncertain Systems with Predefined Upper Bound of Sttling Time
Lecture 59 - Artificial Delayed Output Twisting Algorithm
Lecture 60 - Sliding Mode Approach for the Design of Control Systems for Power Converters