

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

NPTEL Video Course - Aerospace Engineering - NOC:Advanced Aircraft Control Systems with MATLAB-SIMULINK

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Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction
- Lecture 2 - Basics of Linear Algebra
- Lecture 3 - State Space Equation and its Solution
- Lecture 4 - Example
- Lecture 5 - Linear Transformation of States
- Lecture 6 - Example of Linear Transformation
- Lecture 7 - State Space Analysis of Aircraft Longitudinal Dynamics
- Lecture 8 - Introduction to State Feedback Controller Design
- Lecture 9 - Controller Design in the Presence of Noise
- Lecture 10 - Tracking Controller Design
- Lecture 11 - Observability and Observer Design
- Lecture 12 - Example of Observer Design
- Lecture 13 - Ackermann's Formula
- Lecture 14 - Example to Demonstrate use of Ackermann's Formula
- Lecture 15 - Separation Principle
- Lecture 16 - Example of Separation Principle
- Lecture 17 - Example of Control Design for Aircraft System
- Lecture 18 - Example of Observer Design for Aircraft System
- Lecture 19 - Linear Quadratic Regulator
- Lecture 20 - Example of Linear Quadratic Regulator Design
- Lecture 21 - Stability Augmentation for Pitch Dynamics
- Lecture 22 - Stability Augmentation System for Short Period Longitudinal Dynamics
- Lecture 23 - Stability Augmentation System for full Longitudinal Dynamics
- Lecture 24 - Stability Augmentation for Lateral Dynamics
- Lecture 25 - Stability Augmentation for Lateral-Directional Dynamics
- Lecture 26 - Altitude Hold Auto-Pilot Design
- Lecture 27 - Introduction to Nonlinear Systems
- Lecture 28 - Stability of Nonlinear Systems
- Lecture 29 - Classification of Equilibrium Points of Planar Nonlinear Systems

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- Lecture 30 - Limit Cycles
- Lecture 31 - Lyapunov's First Method
- Lecture 32 - Sign Definiteness of Scalar Functions
- Lecture 33 - Lyapunov Stability Theorem
- Lecture 34 - Krasovskii's Theorem
- Lecture 35 - Feedback Linearization
- Lecture 36 - Feedback Linearization (Continued...)
- Lecture 37 - Feedback Linearization Control for Longitudinal Dynamics
- Lecture 38 - Feedback Linearization Based Control for Lateral Dynamics
- Lecture 39 - Introduction to Backstepping Control
- Lecture 40 - Backstepping Controller (Continued...)
- Lecture 41 - Backstepping Controller (Continued...)
- Lecture 42 - Backstepping Controller for Longitudinal Dynamics of Aircraft
- Lecture 43 - Backstepping Control for Lateral-Directional Dynamics of Aircraft
- Lecture 44 - Introduction to Sliding Mode Control
- Lecture 45 - Chattering Reduction in Sliding Mode Control
- Lecture 46 - Sliding Mode Control for Longitudinal Dynamics of Aircraft
- Lecture 47 - Quasi-Sliding Mode control and Backstepping-Sliding Mode Control for Longitudinal Dynamics of Aircraft
- Lecture 48 - Adaptive Sliding Mode Control
- Lecture 49 - Adaptive Back-Stepping Control
- Lecture 50 - MATLAB Implementation of First Order Systems
- Lecture 51 - Second Order System and its Solution
- Lecture 52 - MATLAB Simulation of Mass Spring Damper System
- Lecture 53 - SIMULINK Implementation of Pendulum System
- Lecture 54 - SIMULINK Implementation of Pendulum System (Continued...)
- Lecture 55 - Aircraft Equations of Motion for SIMULINK Block
- Lecture 56 - MATLAB and SIMULINK Implementation of Aircraft Dynamics
- Lecture 57 - 6 Dof Aircraft Equations of Motion
- Lecture 58 - MATLAB and SIMULINK Implementation of Complete 6 Dof Aircraft Dynamics
- Lecture 59 - Recap and Conclusion