NPTEL Video Course - Aerospace Engineering - Optimal Control, Guidance and Estimation

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Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Introduction, Motivation and Overview
Lecture 2 - Overview of SS Approach and Matrix Theory
Lecture 3 - Review of Numerical Methods
Lecture 4 - An Overview of Static Optimization - I
Lecture 5 - An Overview of Static Optimization - II
Lecture 6 - Review of Calculus of Variations - I
Lecture 7 - Review of Calculus of Variations - II
Lecture 8 - Optimal Control Formulation Using Calculus of Variations
Lecture 9 - Classical Numerical Methods to Solve Optimal Control Problems
Lecture 10 - Linear Quadratic Regulator (LQR) - I
Lecture 11 - Linear Quadratic Regulator (LQR) - II
Lecture 12 - Linear Quadratic Regulator (LQR) - III
Lecture 13 - Linear Quadratic Regulator (LQR) - III
Lecture 14 - Discrete-time Optimal Control
Lecture 15 - Overview of Flight Dynamics - I
Lecture 16 - Overview of Flight Dynamics - II
Lecture 17 - Overview of Flight Dynamics - III
Lecture 18 - Linear Optimal Missile Guidance using LQR
Lecture 19 - SDRE and $\hat{I}$ - D Designs
Lecture 20 - Dynamic Programming
Lecture 21 - Approximate Dynamic Programming (ADP), Adaptive Critic (AC) and Single Network Adaptive Critic (
Lecture 22 - Transcription Method to Solve Optimal Control Problems
Lecture 23 - Model Predictive Static Programming (MPSP) and Optimal Guidance of Aerospace Vehicles
Lecture 24 - MPSP for Optimal Missile Guidance
Lecture 25 - Model Predictive Spread Control (MPSC) and Generalized MPSP (G-MPSP) Designs
Lecture 26 - Linear Quadratic Observer & An Overview of State Estimation
Lecture 27 - Review of Probability Theory and Random Variables
Lecture 28 - Kalman Filter Design - I
Lecture 29 - Kalman Filter Design - II

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Lecture 30 - Kalman Filter Design - III
Lecture 31 - Integrated Estimation, Guidance & Control - I
Lecture 32 - Integrated Estimation, Guidance & Control - II
Lecture 33 - LQG Design; Neighboring Optimal Control & Sufficiency Condition
Lecture 34 - Constrained Optimal Control - I
Lecture 35 - Constrained Optimal Control - II
Lecture 36 - Constrained Optimal Control - III
Lecture 37 - Optimal Control of Distributed Parameter Systems - I
Lecture 38 - Optimal Control of Distributed Parameter Systems - II
Lecture 39 - Take Home Material
Lecture 40 - Take Home Material
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