

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

NPTEL Video Course - Mechanical Engineering - NOC:Mechanics and Control of Robotic Manipulators

Subject Co-ordinator - Prof. Santhakumar Mohan

Co-ordinating Institute - IIT - Palakkad

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

- Lecture 1 - Introduction
- Lecture 2 - Introduction to robot mechanics
- Lecture 3 - Introduction to forward and inverse kinematics
- Lecture 4 - Description of position and orientation
- Lecture 5 - Transformation matrix
- Lecture 6 - Compound rotations - Part 1
- Lecture 7 - Compound rotations - Part 2
- Lecture 8 - Kinematic parameters
- Lecture 9 - DH parameters
- Lecture 10 - DH representation
- Lecture 11 - Frame arrangement and examples - Part 1
- Lecture 12 - Examples related to frame arrangement
- Lecture 13 - Frame arrangement and examples - Part 2
- Lecture 14 - Forward and inverse kinematics of robotic manipulators
- Lecture 15 - Examples related to inverse kinematics
- Lecture 16 - Inverse kinematic solution based on numerical methods
- Lecture 17 - Forward kinematic solution using Matlab
- Lecture 18 - Inverse kinematic solution based on numerical methods using Matlab
- Lecture 19 - Introduction to differential kinematics
- Lecture 20 - Velocity propagation model for serial manipulators and Jacobian matrix
- Lecture 21 - Velocity propagation model using Matlab
- Lecture 22 - Manipulator Statics and Workspace singularities
- Lecture 23 - Introduction to robot dynamics and Lagrange-Euler method
- Lecture 24 - Newton-Euler method
- Lecture 25 - Equation of motion in state-space form
- Lecture 26 - Dynamic model derivation using Newton-Euler method in Matlab
- Lecture 27 - Dynamic model derivation using Lagrange-Euler method in Matlab
- Lecture 28 - Dynamic simulation of serial manipulators using Matlab
- Lecture 29 - Introduction to trajectory generation

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- Lecture 30 - Trajectory generation using smooth functions
- Lecture 31 - Trajectory generation schemes for serial manipulators
- Lecture 32 - Trajectory generation using Matlab - Part 1
- Lecture 33 - Trajectory generation using Matlab - Part 2
- Lecture 34 - Trajectory generation for serial manipulators using matlab
- Lecture 35 - Trajectory generation for serial manipulators with workspace using matlab
- Lecture 36 - Introduction to robot motion control
- Lecture 37 - Types of robot manipulator control and concerns
- Lecture 38 - Kinematic control
- Lecture 39 - Matlab simulation on kinematic control
- Lecture 40 - Dynamic control
- Lecture 41 - Simulations related to dynamic control schemes using Matlab - Part 1
- Lecture 42 - Cascaded control design
- Lecture 43 - Simulations related to dynamic control schemes using Matlab - Part 2
- Lecture 44 - Simulations related to dynamic control schemes using Matlab - Part 3
- Lecture 45 - Kinematic and dynamic models of a mobile robot using DH approach