

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

NPTEL Video Course - Computer Science and Engineering - NOC:Distributed Optimization and Machine Learning

Subject Co-ordinator - Prof. Mayank Baranwal

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Introduction to optimization
- Lecture 2 - Analyzing optimization algorithms in continuous time domain
- Lecture 3 - Course Outline
- Lecture 4 - Basics of optimization problems
- Lecture 5 - Convex sets and Convex functions
- Lecture 6 - Strictly and strongly convex functions
- Lecture 7 - Implications of strong convexity
- Lecture 8 - Primal and dual optimization problems
- Lecture 9 - Slaters condition
- Lecture 10 - Analysis of gradient descent algorithm
- Lecture 11 - KKT conditions
- Lecture 12 - Acceleration under strong convexity
- Lecture 13 - Accelerate the convergence even further
- Lecture 14 - Stability theory
- Lecture 15 - Connections to optimization problems
- Lecture 16 - Exponential stability
- Lecture 17 - Bregman Divergence
- Lecture 18 - Rescaled Gradient Flow
- Lecture 19 - Advanced Results on PL inequality - Part 1
- Lecture 20 - Advanced Results on PL inequality - Part 2
- Lecture 21 - Constrained Optimization Problem
- Lecture 22 - Augmented Lagrangian
- Lecture 23 - Method of Multipliers
- Lecture 24 - Dual Ascent and Dual Decomposition
- Lecture 25 - ADMM Algorithm
- Lecture 26 - Basics of Graph Theory - 1
- Lecture 27 - Basics of Graph Theory - 2
- Lecture 28 - Consensus and Average Consensus - 1
- Lecture 29 - Consensus and Average Consensus - 2

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- Lecture 30 - Consensus Algorithms
- Lecture 31 - Consensus Algorithms - Fixed time
- Lecture 32 - Distributed Economic Dispatch Problem
- Lecture 33 - Algorithm for Uncapacitated EDP
- Lecture 34 - Capacitated EDP
- Lecture 35 - Algorithms for Distributed Optimization - 1
- Lecture 36 - Algorithms for Distributed Optimization - 2
- Lecture 37 - Continuous-time Distributed Optimization Algorithms
- Lecture 38 - Introduction to Neural Networks
- Lecture 39 - Large Scale Machine Learning
- Lecture 40 - Decentralized Stochastic Gradient Descent - 1
- Lecture 41 - Decentralized Stochastic Gradient Descent - 2
- Lecture 42 - Introduction to Federated Learning
- Lecture 43 - FedAvg Algorithm
- Lecture 44 - Convergence Analysis of FL
- Lecture 45 - Sources of Computational Heterogeneity in FL
- Lecture 46 - Objective Inconsistency Problem
- Lecture 47 - General Update Rule