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- Lecture 2 - Introduction to Graph Theory - Part 2
- Lecture 3 - Introduction to Graph Algorithms - Part 1
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- Lecture 5 - Havel Hakimi Theorem - Part 1
- Lecture 6 - Havel Hakimi Theorem - Part 2
- Lecture 7 - Havel Hakimi Theorem - Part 3
- Lecture 8 - Graph Traversals - Part 1
- Lecture 9 - Graph Traversals - Part 2
- Lecture 10 - Topological Sort and Mengers Theorem - Part 1
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- Lecture 12 - Topological Sort and Mengers Theorem - Part 3
- Lecture 13 - Hamiltonian Graphs - Part 1
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- Lecture 15 - Shortest path Algorithms 1 - Part 1
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- Lecture 19 - Matching in Graphs - Part 1
- Lecture 20 - Matching in Graphs - Part 2
- Lecture 21 - Some Graph Theoretic Puzzles - Part 1
- Lecture 22 - Some Graph Theoretic Puzzles - Part 2
- Lecture 23 - Network Flow Algorithms - Part 1
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- Lecture 29 - Network Flows - Part 1
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- Lecture 33 - Turán's and Mader's theorem - Part 1
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- Lecture 35 - NP Computations - Part 1
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- Lecture 37 - Spectral Graph Theory-I - Part 1
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- Lecture 40 - NP Computations II - Part 1
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- Lecture 42 - Graph Coloring - Part 1
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- Lecture 44 - Spectral Graph Theory-II - Part 1
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- Lecture 46 - NP Computations Reductions - Part 1
- Lecture 47 - NP Computations Reductions - Part 2
- Lecture 48 - NP Computations Reductions - Part 3
- Lecture 49 - Spectral Graph Theory-III - Part 1
- Lecture 50 - Planar Graphs - Part 1
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- Lecture 52 - NP Computations and Approximation Algorithms - Part 1
- Lecture 53 - NP Computations and Approximation Algorithms - Part 2
- Lecture 54 - Spectral Graph Theory-IV - Part 1
- Lecture 55 - Spectral Graph Theory-IV - Part 2
- Lecture 56 - Approximation Algorithms I - Part 1
- Lecture 57 - Approximation Algorithms I - Part 2
- Lecture 58 - Social Network Analysis - Part 1
- Lecture 59 - Social Network Analysis - Part 2
- Lecture 60 - Spectral Graph Theory-V - Part 1
- Lecture 61 - Spectral Graph Theory-V - Part 2
- Lecture 62 - Approximation Algorithms II - Part 1
- Lecture 63 - Approximation Algorithms II - Part 2
- Lecture 64 - Spectral Graph Theory-VI - Part 1

Lecture 65 - Spectral Graph Theory-VI - Part 2

Lecture 66 - RSA Crypto - Part 1

Lecture 67 - RSA Crypto - Part 2

Lecture 68 - Approximation Algorithms III - Part 1

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Lecture 79 - Introduction to Parameterized Algorithms - Part 1

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Lecture 81 - Chardal Graphs - Part 1

Lecture 82 - Chardal Graphs - Part 2

Lecture 83 - Branching - Part 1

Lecture 84 - Branching - Part 2

Lecture 85 - Interval Graphs and Split Graphs - Part 1

Lecture 86 - Interval Graphs and Split Graphs - Part 2

Lecture 87 - Vertex cover linear vertex kernel using LP - Part 1

Lecture 88 - Vertex cover linear vertex kernel using LP - Part 2

Lecture 89 - Comparability Graphs - Part 1

Lecture 90 - Comparability Graphs - Part 2

Lecture 91 - Introduction to Randomized Algorithms and Karger's Min-cut Algorithm - Part 1

Lecture 92 - Introduction to Randomized Algorithms and Karger's Min-cut Algorithm - Part 2

Lecture 93 - Probability Methods to Ramsey Number - Part 2

Lecture 94 - Probability Methods to Ramsey Number - Part 2

Lecture 95 - Color Coding - Part 1

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Lecture 97 - Fast Min-cut Algorithm and its analysis - Part 1

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[Lecture 101 - Hardness for FPT - Part 1](#)

[Lecture 102 - Hardness for FPT - Part 2](#)

[Lecture 103 - Application of min-cut Algorithm](#)

**NPTEL : ACM Summer School in Data Science (Special Lecture Series)**

**Co-ordinators : Prof. Murugaiyan Amirthalingam**

Lecture 1 - Probability - Part 1

Lecture 2 - Probability - Part 2

Lecture 3 - Probability - Part 3

Lecture 4 - Math Foundation - Part 1

Lecture 5 - Math Foundation - Part 2

Lecture 6 - Math Foundation - Part 3

Lecture 7 - Math Foundation 2 - Part 1

Lecture 8 - Math Foundation 2 - Part 2

Lecture 9 - Math Foundation 2 - Part 3

Lecture 10 - Introduction to probability for Data science - Part 1

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Lecture 21 - Clustering II - Part 3

Lecture 22 - Dimensionality Reduction - Part 1

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Lecture 24 - Dimensionality Reduction - Part 3

Lecture 25 - Supervised Learning I - Part 1

Lecture 26 - Supervised Learning I - Part 2

Lecture 27 - Supervised Learning I - Part 3

Lecture 28 - Supervised Learning II - Part 1

Lecture 29 - Supervised Learning II - Part 2

Lecture 30 - Supervised Learning II - Part 3

Lecture 31 - Supervised Learning III - Part 1

Lecture 32 - Supervised Learning III - Part 2  
Lecture 33 - Supervised Learning III - Part 3  
Lecture 34 - Linear Models For Classification - Part 1  
Lecture 35 - Linear Models For Classification - Part 2  
Lecture 36 - Linear Models For Classification - Part 3  
Lecture 37 - Tree Based Methods - Part 1  
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Lecture 42 - Ensemble Methods - Part 1  
Lecture 43 - Ensemble Methods - Part 2  
Lecture 44 - Ensemble Methods - Part 3  
Lecture 45 - Learning Theory - Part 1  
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Lecture 49 - Introduction to Probabilistic Modeling - Part 3  
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Lecture 56 - Deep Learning I - Part 1  
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Lecture 59 - Deep Learning II - Part 1  
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[Lecture 71 - Map-Reduce and Spark - Part 3](#)

[Lecture 72 - Scalable Machine Learning - Part 1](#)

[Lecture 73 - Scalable Machine Learning - Part 2](#)

**NPTEL : Topics in Theoretical Computer Science (Special Lecture Series)**

**Co-ordinators : Dr. N S. Narayanaswamy**

Lecture 1 - Finite Automata

Lecture 2 - TMs, Halting Problems

Lecture 3 - Concurrency

Lecture 4 - Blockchain and Bitcoin

Lecture 5 - Complexity Theory

Lecture 6 - Lower Bounds, Dealing with NP hardness

Lecture 7 - Online and streaming algorithms

Lecture 8 - Zero Knowledge Proofs

Lecture 9 - Verification, Games



**NPTEL : Researching Anglo-Indians in India and the Diaspora (Special Lecture Series)**

**Co-ordinators : Prof. Merin Simi Raj**

Lecture 1 - Keynote Address

Lecture 2 - A Synopsis of 'Two Cheers'

Lecture 3 - Higher Education Among Anglo-Indians

Lecture 4 - Perception of trust, risk and intimacy among elderly Anglo-Indians living in Tollygunge home in Kolkata

Lecture 5 - The Daunting Spirit and the Empowering Voice of Eunice De Souza

Lecture 6 - Origin Myth and Anglo-Indian Identity: Exploring the Representation of the History of the Origin of Anglo-Indian community in Hugh and Colleen Gantzers Lyndsale Raj

Lecture 7 - Keynote Address

Lecture 8 - Shame and Guilt in Alison McQueens The Secret Children

Lecture 9 - Re-visiting McCluskieganj: De-hyphenating the Anglo-Indian Consciousness through Vikas Kumar Jhas Novel

Lecture 10 - The Imaging of the Anglo-Indian Woman in Colonialist Literature

Lecture 11 - Expostulating Celluloid Stereotypes: Researching Anglo-Indian Representation in Malayalam Cinema

Lecture 12 - Chutney Mary: Rethinking AI Identity through their Culinary Consumption Culture

Lecture 13 - In Search of a New Home: Anglo-Indians in the Darjeeling Hills, 1900-1947

Lecture 14 - (Re)discovering Anglo-Indians of Visakhapatnam - An Overview

Lecture 15 - Genealogy of Sporting Culture through a Study of Anglo-Indian Institutions of Asansol

Lecture 16 - Keynote Address

Lecture 17 - Crowdsourcing as a Research Tool

Lecture 18 - Researching Community, Writing Cultures: Challenges and Opportunities

Lecture 19 - Revisiting the Anglo-Indian Community: Making and Unmaking of Anglo-Indian Identity in India

Lecture 20 - Minoritizing English: Anglo-Indians as a Linguistic Minority in India

**NPTEL : Dravidian Temple Architecture and Construction Techniques (Special Lecture Series)**

**Co-ordinators : Unknown**

Lecture 1 - Introduction to Dravidian Temple Architecture and Construction Techniques - Part 1

Lecture 2 - Introduction to Dravidian Temple Architecture and Construction Techniques - Part 2

Lecture 3 - Introduction to Dravidian Temple Architecture and Construction Techniques - Part 3

Lecture 4 - Introduction to Dravidian Temple Architecture and Construction Techniques - Part 4

Lecture 5 - Introduction to Dravidian Temple Architecture and Construction Techniques - Part 5

Lecture 6 - Naal Kurithal - Part 1

Lecture 7 - Naal Kurithal - Part 2

Lecture 8 - Naal Kurithal - Part 3

Lecture 9 - Naal Kurithal - Part 4

Lecture 10 - Naal Kurithal - Part 5

Lecture 11 - Naal Kurithal - Part 6

Lecture 12 - Ayadhi Calculations - Part 1

Lecture 13 - Ayadhi Calculations - Part 2

Lecture 14 - Ayadhi Calculations - Part 3

Lecture 15 - Ayadhi Calculations - Part 4

Lecture 16 - Ayadhi Calculations - Part 5

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Lecture 18 - Ayadhi Calculations - Part 7

Lecture 19 - Ayadhi Calculations - Part 8

Lecture 20 - Ayadhi Calculations - Part 9

Lecture 21 - Ayadhi Calculations - Part 10

Lecture 22 - Ayadhi Calculations - Part 11

Lecture 23 - Alavukal - Part 1

Lecture 24 - Alavukal - Part 2

Lecture 25 - Alavukal - Part 3

Lecture 26 - Alavukal - Part 4

Lecture 27 - Alavukal - Part 5

Lecture 28 - Alavukal - Part 6

Lecture 29 - Dhisai Aridhal - Part 1

Lecture 30 - Dhisai Aridhal - Part 2

Lecture 31 - Dhisai Aridhal - Part 3

[Lecture 32 - Dhisai Aridhal - Part 4](#)

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**NPTEL : ACM Summer School in Data Science (Bangalore) (Special Lecture Series)**

**Co-ordinators : Unknown**

Lecture 1 - Web Browser Security

Lecture 2 - Trusted Computing

Lecture 3 - Buffer Overflow Vulnerability and Protection Techneques

Lecture 4 - Secure Software Engineering : Secure Design Principles and Coding Practices

Lecture 5 - Challenges and Opportunities with Cloud Security

Lecture 6 - Cognitive Security with Watson

Lecture 7 - IBM MaaS360 Architecture Overview

Lecture 8 - Unified Risk Management Approach

Lecture 9 - Data Encryption and Post Quantum Cryptography (PQC)

Lecture 10 - Network Security - I

Lecture 11 - Network Security - II

Lecture 12 - Network Security - III

Lecture 13 - Network Security - IV

Lecture 14 - Network Security - V

Lecture 15 - Network Security - VI

Lecture 16 - Security: Network and Transport Layers - I

Lecture 17 - Security: Network and Transport Layers - II

Lecture 18 - Security: Network and Transport Layers - III

Lecture 19 - Security Gap Analysis - I

Lecture 20 - Security Gap Analysis - II

**NPTEL : ACM Summer School on Algorithmic Game Theory (Special Lecture Series)**

**Co-ordinators : Prof. Meghana Nasre**

- Lecture 1 - Introduction to Stable Matchings
- Lecture 2 - Men-Optimality of the Men-Proposing Gale-Shapley Algorithm
- Lecture 3 - GS: Cheating Strategies for Men
- Lecture 4 - GS: Cheating Strategies for Women
- Lecture 5 - The Hospital Residents Problem
- Lecture 6 - Popular Matchings in the stable marriage problem
- Lecture 7 - Popularity in the House Allocation Problem - 1
- Lecture 8 - Popularity in the House Allocation Problem - 2
- Lecture 9 - Strategic Behavior in Popular Matchings
- Lecture 10 - Stable Roommates: Matchings in the Non-bipartite Setting
- Lecture 11 - An Introduction to Voting
- Lecture 12 - The Game of Trust - Nicky Case's Interactive Essay
- Lecture 13 - Arrow's Theorem
- Lecture 14 - Gibbard-Satterthwaite Theorem
- Lecture 15 - Domain Restrictions and Multiwinner Elections
- Lecture 16 - Incentive Design in Crowdsourcing Applications
- Lecture 17 - Adversarial Approaches in Deep Learning - Part 1
- Lecture 18 - Adversarial Approaches in Deep Learning - Part 2
- Lecture 19 - Algorithmic for Computing Market Equilibrium
- Lecture 20 - Tournament Fixing and Superkings
- Lecture 21 - Tournament Fixing Parameterized by FAS
- Lecture 22 - Tournament Fixing with Bribery
- Lecture 23 - An Introduction to Cake-Cutting
- Lecture 24 - Two Algorithms for Finding Proportional Allocations
- Lecture 25 - Envy-Freenes and Approximate EF
- Lecture 26 - Sperner's Lemma and Applications
- Lecture 27 - Cake Cutting with a Secret Agent
- Lecture 28 - Fairness Notions for Indivisible Goods
- Lecture 29 - Computing EF1 Allocations: Cycle Trading and Round Robin
- Lecture 30 - An Introduction to Rent Division
- Lecture 31 - Rent Division and Maximum Weight Matchings

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[Lecture 32 - Hall's Theorem and Maximin Share](#)

[Lecture 33 - Probability Review - Part 1](#)

[Lecture 34 - Probability Review - Part 2](#)

[Lecture 35 - Predicting Election Outcomes](#)

[Lecture 36 - Reservoir Sampling and Preference Elicitation](#)

Lecture 1 - Basic Graph theory and Graph Algorithms - Part 1

Lecture 2 - Basic Graph theory and Graph Algorithms - Part 2

Lecture 3 - Basic Graph theory and Graph Algorithms - Part 3

Lecture 4 - Basic Graph theory and Graph Algorithms - Part 4

Lecture 5 - Basic Graph theory and Graph Algorithms - Part 5

Lecture 6 - Geometric Algorithms - Part 1

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Lecture 8 - Geometric Algorithms - Part 3

Lecture 9 - Geometric Algorithms - Part 4

Lecture 10 - Geometric Algorithms - Part 5

Lecture 11 - Geometric Algorithms - Part 6

Lecture 12 - Introduction to Computational Complexity,P,NP classes

Lecture 13 - NPC Reductions through examples - Part 1

Lecture 14 - NPC Reductions through examples - Part 2

Lecture 15 - NPC Reductions through examples - 3SAT

Lecture 16 - Subset Sum, Knapsack

Lecture 17 - Directed Hamiltonian Path-NPC Reduction

Lecture 18 - Introduction to LPnDuality theorem

Lecture 19 - Design of Approx.algorithms using primal dual scheme - Hitting set

Lecture 20 - Approx Vertex Cover

Lecture 21 - Appox for Min Cost VC, Approx for Min cost Set Cover

Lecture 22 - 2-factor approx for metric TSP, 1.5 Approx christofides Algo

Lecture 23 - knapsack Approx, 1/2 - factor Approx, 1-  $\epsilon$  Approx: FPTAS

Lecture 24 - Perfect graphs,weak and strong perfect graph conjecture,line graphs,interval graphs

Lecture 25 -  $\hat{1}$  perfection of interval graphs,chordal graphs,expansion lemma, proof for weak perfect conjecture - Part 1

Lecture 26 -  $\hat{1}$  perfection of interval graphs,chordal graphs,expansion lemma, proof for weak perfect conjecture - Part 2

Lecture 27 - Comparability graph, Permutation graphs, AT-free graphs, Trapezoidal graphs, Circular arc graphs, Boxicity and related concepts

Lecture 28 - Fixed Parameter Algorithms, -VC, Cluster vertex deletion, - Branching

Lecture 29 - Kernelization, -VC, CrownDecomposition, Feedback vertex set, Herative compression, Analysing branching algorithm - Part 1

Lecture 30 - Kernelization, -VC, CrownDecomposition, Feedback vertex set, Herative compression, Analysing branching algorithm -

Part 2

Lecture 31 - Kernelization, -VC, CrownDecomposition, Feedback vertex set, Herative compression, Analysing branching algorithm - Part 3

Lecture 32 - Hardness in Parameterized Complexity - W - hard reductions Exponential algorithms - Part 1

Lecture 33 - Hardness in Parameterized Complexity - W - hard reductions Exponential algorithms - Part 2



Lecture 1 - Lattice Theory - Part 1

Lecture 2 - Lattice Theory - Part 2

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Lecture 4 - Lattice Theory - Part 4

Lecture 5 - Lattice Theory - Part 5

Lecture 6 - Lattice Theory - Part 6

Lecture 7 - Lattice Theory - Part 7

Lecture 8 - Lattice Theory - Part 8

Lecture 9 - Lattice Theory - Part 9

Lecture 10 - Machine Dependent Optimizations - Part 1

Lecture 11 - Machine Dependent Optimizations - Part 2

Lecture 12 - Machine Dependent Optimizations - Part 3

Lecture 13 - Machine Dependent Optimizations - Part 4

Lecture 14 - Machine Dependent Optimizations - Part 5

Lecture 15 - Machine Dependent Optimizations - Part 6

Lecture 16 - Machine Dependent Optimizations - Part 7

Lecture 17 - Machine Dependent Optimizations - Part 8

Lecture 18 - Machine Dependent Optimizations - Part 9

Lecture 19 - Machine Dependent Optimizations - Part 10

Lecture 20 - Program Execution Environment - Part 1

Lecture 21 - Program Execution Environment - Part 2

Lecture 22 - Program Execution Environment - Part 3

Lecture 23 - Program Execution Environment - Part 4

Lecture 24 - Program Execution Environment - Part 5

Lecture 25 - Program Execution Environment - Part 6

Lecture 26 - Program Execution Environment - Part 7

Lecture 27 - Program Execution Environment - Part 8

Lecture 28 - Optimizing Virtual Function Calls

Lecture 29 - High Level Optimizations - Part 1

Lecture 30 - High Level Optimizations - Part 2

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[Lecture 33 - High Level Optimizations - Part 5](#)

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- Lecture 1 - Introduction to Computational Geometry
- Lecture 2 - Convex hull
- Lecture 3 - Quick hull
- Lecture 4 - Plane sweep algorithm
- Lecture 5 - Voronoi Diagram - I
- Lecture 6 - Convex Geometry - I
- Lecture 7 - Convex Geometry - II
- Lecture 8 - Incidence Geometry - I
- Lecture 9 - Incidence Geometry - II
- Lecture 10 - Plane sweep algorithm
- Lecture 11 - Polygon Triangulation
- Lecture 12 - Geometric and Abstract Simplicial Complexes
- Lecture 13 - Convex Polytopes and Polyhedra
- Lecture 14 - Art Gallery Theorem
- Lecture 15 - Smallest Enclosing Disc
- Lecture 16 - Point Hyperplane Duality
- Lecture 17 - Voronoi Diagrams and Delaunay triangulations - I
- Lecture 18 - Voronoi Diagrams and Delaunay triangulations - II
- Lecture 19 - Point Location
- Lecture 20 - Range Searching (KD Tree)
- Lecture 21 - Range Searching (Range Tree)
- Lecture 22 - Visibility Graph and motion planning
- Lecture 23 - Geometric Approximation: The Shifting Strategy, Hochbaum and Mass, 1984
- Lecture 24 - Application of incidence geometry in combinatorics
- Lecture 25 - Robot motion planning and visibility
- Lecture 26 - Reeb Graph Introduction and Morse Theory basics
- Lecture 27 - Reeb Graph Properties
- Lecture 28 - Reeb Graph Algorithms, Applications
- Lecture 29 - Arrangements - I
- Lecture 30 - Linear Programming
- Lecture 31 - Arrangements - II

[Lecture 32 - Zone Theorem and Application](#)

[Lecture 33 - Randomized Incremental Construction - I](#)

[Lecture 34 - Randomized Incremental Construction - II](#)

[Lecture 35 - VC-dimension, Epsilon-nets, LP-based approximation for Geometric Covering](#)

[Lecture 36 - Quasi-uniform Sampling for Weighted Covering Problems.](#)

[Lecture 37 - Local Search for Packing and Covering](#)

[Lecture 38 - PTAS via Local Search - I](#)

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Lecture 3 - Learning on Finite State Automata and Decision Session - 3

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Lecture 8 - Probability Session - 5

Lecture 9 - Probability Session - 6

Lecture 10 - Probability Session - 7

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Lecture 22 - Neural Networks Session - 5

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Lecture 24 - Basic of Algorithm Design Session - 1

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Lecture 32 - Introduction to Reinforcement Learning Session - 3

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Lecture 38 - Introduction of Cryptography Session - 2

Lecture 39 - Introduction of Cryptography Session - 3

Lecture 40 - Compressive Sensing Session - 1

Lecture 41 - Compressive Sensing Session - 2

Lecture 42 - Compressive Sensing Session - 3

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Lecture 47 - Compressive Sensing Session - 8