

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

NPTEL Video Course - Computer Science and Engineering - NOC:Computational Complexity

Subject Co-ordinator - Prof. Subrahmanyam Kalyanasundaram

Co-ordinating Institute - IIT - Hyderabad

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

Lecture 1 - Introduction to Computational Complexity
Lecture 2 - The Class P
Lecture 3 - The Class NP
Lecture 4 - The Class NP - Alternate Definition
Lecture 5 - Polynomial Time Reductions
Lecture 6 - NP - Completeness
Lecture 7 - Cook Levin Theorem - Part 1
Lecture 8 - Cook Levin Theorem - Part 2
Lecture 9 - More NP Complete Problems
Lecture 10 - Polynomial Hierarchy - Part 1
Lecture 11 - Polynomial Hierarchy - Part 2
Lecture 12 - Polynomial Hierarchy - Part 3
Lecture 13 - Time Hierarchy Theorem
Lecture 14 - Introduction to Space Complexity
Lecture 15 - NL-Completeness
Lecture 16 - Savitch's Theorem
Lecture 17 - NL = co-NL - Part 1
Lecture 18 - NL = co-NL - Part 2
Lecture 19 - PSPACE Completeness
Lecture 20 - Games and PSPACE Completeness
Lecture 21 - Space Hierarchy Theorem
Lecture 22 - Ladner's Theorem
Lecture 23 - Oracle Turing Machines
Lecture 24 - Polynomial Hierarchy Using Oracles
Lecture 25 - Baker-Gill-Solovay Theorem - Part 1
Lecture 26 - Baker-Gill-Solovay Theorem - Part 2
Lecture 27 - Randomized Complexity Classes - Part 1
Lecture 28 - Randomized Complexity Classes - Part 2
Lecture 29 - Randomized Complexity Classes - Part 3

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- Lecture 30 - Randomized Complexity Classes - Part 4
- Lecture 31 - Comparison Between Randomized Complexity Classes
- Lecture 32 - BPP is in Polynomial Hierarchy
- Lecture 33 - Circuit Complexity - Part 1
- Lecture 34 - Circuit Complexity - Part 2
- Lecture 35 - Formal Definition of Circuits
- Lecture 36 - Hierarchy Theorem for Circuit Size
- Lecture 37 - Complexity Class : P/Poly
- Lecture 38 - Karp-Lipton Theorem
- Lecture 39 - Turing Machines That Take Advice
- Lecture 40 - Classes NC and AC
- Lecture 41 - Parity Not in AC0 - Part 1
- Lecture 42 - Parity Not in AC0 - Part 2
- Lecture 43 - Adleman's Theorem
- Lecture 44 - Polynomial Identity Testing and Bipartite Perfect Matching in RNC
- Lecture 45 - Search Bipartite Perfect Matching is in RNC - Part 1
- Lecture 46 - Search Bipartite Perfect Matching is in RNC - Part 2
- Lecture 47 - Promise Problems and Valiant-Vazirani Theorem
- Lecture 48 - Valiant Vazirani Theorem Continued
- Lecture 49 - #P and the Complexity of Counting
- Lecture 50 - Permanent is #P-Complete - Part 1
- Lecture 51 - Permanent is #P-Complete - Part 2
- Lecture 52 - Toda's Theorem - Part 1
- Lecture 53 - Toda's Theorem - Part 2
- Lecture 54 - Introduction to Communication Complexity - Part 1
- Lecture 55 - Introduction to Communication Complexity - Part 2
- Lecture 56 - Lower Bound Techniques
- Lecture 57 - Communication Complexity of Relations
- Lecture 58 - Monotone Depth Lower Bound for Matching
- Lecture 59 - Interactive Proofs
- Lecture 60 - #3SAT is in IP
- Lecture 61 - Public Coin Interactive Proofs and AM/MA
- Lecture 62 - Simulating Private Coins using Public Coins
- Lecture 63 - Summary and Concluding Remarks