NPTEL Video Course - Electrical Engineering - NOC:Information Theory

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Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - What is information?
Lecture 2 - How to model uncertainty?
Lecture 3 - Basic concepts of probability
Lecture 4 - Estimates of random variables
Lecture 5 - Limit theorems
Lecture 6 - Review
Lecture 7 - Source model
Lecture 8 - Motivating examples
Lecture 9 - A compression problem
Lecture 10 - Shannon entropy
Lecture 11 - Random hash
Lecture 12 - Review 2
Lecture 13 - Uncertainty and randomness
Lecture 14 - Total variation distance
Lecture 15 - Generating almost random bits
Lecture 16 - Generating samples from a distribution using uniform randomness
Lecture 17 - Typical sets and entropy
Lecture 18 - Review 3
Lecture 19 - Hypothesis testing and estimation
Lecture 20 - Examples
Lecture 21 - The log-likelihood ratio test
Lecture 22 - Kullback-Leibler divergence and Stein's lemma
Lecture 23 - Properties of KL divergence
Lecture 24 - Review 4
Lecture 25 - Information per coin-toss
Lecture 26 - Multiple hypothesis testing
Lecture 27 - Error analysis of multiple hypothesis testing
Lecture 28 - Mutual information
Lecture 29 - Fano's inequality

Lecture 30 - Measures of information
Lecture 31 - Chain rules
Lecture 32 - Shape of measures of information
Lecture 33 - Data processing inequality
Lecture 34 - Midyear Review
Lecture 35 - Proof of Fano's inequality
Lecture 36 - Variational formulae
Lecture 37 - Capacity as information radius
Lecture 38 - Proof of Pinsker's inequality
Lecture 39 - Continuity of entropy
Lecture 40 - Lower bound for compression
Lecture 41 - Lower bound for hypothesis testing
Lecture 42 - Review 7
Lecture 43 - Lower bound for random number generation
Lecture 44 - Strong converse
Lecture 45 - Lower bound for minmax statistical estimation
Lecture 46 - Variable length source codes
Lecture 47 - Review 8
Lecture 48 - Kraft's inequality
Lecture 49 - Shannon code
Lecture 50 - Huffman code
Lecture 51 - Minmax Redundancy
Lecture 52 - Type based universal compression
Lecture 53 - Review 9
Lecture 54 - Arithmetic code
Lecture 55 - Online probability assignment
Lecture 56 - Compression of databases
Lecture 57 - Compression of databases
Lecture 58 - Repetition code
Lecture 59 - Channel capacity
Lecture 60 - Sphere packing bound for BSC
Lecture 61 - Random coding bound for BSC
Lecture 62 - Random coding bound for general channel
Lecture 63 - Review 11
Lecture 64 - Converse proof for channel coding theorem
Lecture 65 - Additive Gaussian Noise channel
Lecture 66 - Mutual information and differential entropy
Lecture 67 - Channel coding theorem for Gaussan channel
Lecture 68 - Parallel channels and water-filling