NPTEL Video Course - Computer Science and Engineering - NOC:Introduction to Parallel Programming in OpenMP

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Co-ordinating Institute - IIT - Delhi

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

Lecture 30 - Completion of tasks and scoping variables in tasks
Lecture 31 - Recursive task spawning and pitfalls
Lecture 32 - Understanding LU Factorization
Lecture 33 - Parallel LU Factorization
Lecture 34 - Locks
Lecture 35 - Advanced Task handling
Lecture 36 - Matrix Multiplication using tasks
Lecture 37 - The OpenMP Shared Memory Consistency Model
Lecture 38 - Applications finite element method
Lecture 39 - Applications deep learning
Lecture 40 - Introduction to MPI and basic calls
Lecture 41 - MPI calls to send and receive data
Lecture 42 - MPI calls for broadcasting data
Lecture 43 - MPI non blocking calls
Lecture 44 - Application distributed histogram updation
Lecture 45 - MPI collectives and MPI broadcast
Lecture 46 - MPI gathering and scattering collectives
Lecture 47 - MPI reduction and alltoall collectives
Lecture 48 - Discussion on MPI collectives design
Lecture 49 - Characteriziation of interconnects
Lecture 50 - Linear arrays 2D mesh and torus
Lecture 51 - d dimensional torus
Lecture 52 - Hypercube
Lecture 53 - Trees and cliques
Lecture 54 - Hockney model
Lecture 55 - Broadcast and Reduce with recursive doubling
Lecture 56 - Scatter and Gather with recursive doubling
Lecture 57 - Reduce scatter and All gather with recursive doubling
Lecture 58 - Discussion of message sizes in analysis
Lecture 59 - Revisiting Reduce scatter on 2D mesh
Lecture 60 - Reduce scatter and Allreduce on the Hypercube
Lecture 61 - Alltoall on the Hypercube
Lecture 62 - Lower bounds
Lecture 63 - Pipeline based algorithm for Allreduce
Lecture 64 - An improved algorithm for Alltoall on the Hypercube using E-cube routing
Lecture 65 - Pipeline based algorithm for Broadcast
Lecture 66 - Introduction to parallel graph algorithms
Lecture 67 - Breadth First Search BFS using matrix algebra
Lecture 68 - BFS Shared memory parallelization using OpenMP

Lecture 69 - Distributed memory settings and data distribution
Lecture 70 - Distributed BFS algorithm
Lecture 71 - Performance considerations
Lecture 72 - Prims Algorithm
Lecture 73 - OpenMP based shared memory parallelization for MST
Lecture 74 - MPI based distributed memory parallelization for MST
Lecture 75 - Sequential Algorithm Adaptation from Prims
Lecture 76 - Parallelization Strategy for Prims algorithm
Lecture 77 - Dry run with the parallel strategy
Lecture 78 - Johnsons algorithm with 1D data distribution
Lecture 79 - Speedup analysis on a grid graph
Lecture 80 - Floyds algorithm for all pair shortest paths
Lecture 81 - Floyds algorithm with 2D data distribution
Lecture 82 - Adaptation to transitive closures
Lecture 83 - Parallelization strategy for connected components
Lecture 84 - Analysis for parallel connected components