

Review Session

Course 1-02-435: Distributed Algorithms in Network Communication

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Abstract

This review session is meant to help review concepts from that we covered over the course of the semester. There are no computation problems, just concepts to review. The students are expected to review the equations and mathematics on their own.

1 Definitions

1. Distributed System
2. Asynchrony
3. Limited Local Knowledge
4. Global Time
5. Asynchronous/Synchronous Communication
6. Control Oriented/Event Driven Programming
7. Undirected graph
 - Connected graph
 - Connected component
8. Directed graph
 - Strongly connected graph
 - Strongly connected component
9. Subgraph, Induced subgraph
10. Path, Simple path
11. Cycle, simple cycle
12. Graph: Diameter, Distance
13. Regular graph, d -regular graph
14. Bipartite graph
15. Graph types:
 - Grid
 - Torus
 - Trees, forests, stars
 - Hypercube
 - Clique (complete graph)
16. Spanning tree, minimum weight spanning tree
17. Labeled transition system
18. Executions
19. Distributed Algorithm
20. Local Algorithm
21. Asynchronous communication model
 - Events
22. Synchronous communication model
23. Independent events
24. Fairness

- Unconditionally fair
 - Weakly fair
 - Strongly fair
25. Safety property
 26. Liveness property
 27. Invariant
 28. Norm functions
 29. Causal order
 30. Space-time diagram
 - Consistent cut
 - Rubber band transformation
 - Equivalent executions
 31. Logical clocks
 - Lamport
 - Vector
 32. Wave Algorithm
 - Definition
 - Properties
 - Usage
 - Propagation with feedback (PIF)
 - Synchronizing
 - Infimum (functions)
 - Traversal
 - DFS
 33. Traversal Algorithms
 - F -traversal algorithm
 34. Destination Based Routing
 35. S -path and S -distance
 - 36.

2 Algorithms

1. Ring Algorithm
2. Polling Algorithm
 - Sequential Polling
3. Tree Algorithm
4. Echo Algorithm
5. Clique traversal
6. Torus traversal
7. Hypercube traversal
8. Tarry's traversal algorithm
9. Classical DFS
10. Awerbuch DFS
11. DFS with neighbor knowledge
12. Balanced Sliding Window
13. Timer based Sliding Window
14. Floyd-Warshall
15. Toueg's Algorithm
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