

CSE535 Asynchronous Systems

Spring 2018

Course Description:

With the wide use of networked and embedded systems, today's computing environment is naturally a distributed system. In the class, we will learn the basic and advanced algorithms for the distributed systems. We will also study some real-world examples of distributed systems.

Class hours: MW 2:00pm ~ 3:20pm

Class room: B206

Office hours: TBD

Instructor:

YoungMin Kwon

Office: B420

email: youngmin.kwon at sunykorea.ac.kr

Textbook and References:

Distributed Computing, Principles, Algorithms, and Systems, Cambridge , 2011, ISBN 978-0-521-18984-2.

Authors: Ajay D. Kshemkalyani and Mukesh Singhal

Hadoop: The Definitive Guide 4th Edition, O'Reilly, 2015, ISBN 978-1-491-90163-2

Author: Tom White

Course Website: <http://www3.cs.stonybrook.edu/~youngkwon/cse535/>

Grading:

Midterm exam: 25%

Final exam: 25%

Programming assignments: 25%

Presentations: 25%

Major Topics Covered in the Class: (tentative)

- Logical time and Global state
- Coordination and Agreement
- Fault tolerance
- Distributed shared memory

Course Learning Outcomes:

- Learn basic and advanced distributed algorithms
- Ability to write distributed programs
- Ability to analyze distributed algorithms

Tentative Course Schedule:

Week	Topics
Week 1 (2/26, 2/28)	Introduction, Models of Computation
Week 2 (3/5, 3/7)	Logical Time
Week 3 (3/12, 3/14)	Global State
Week 4 (3/21, 3/26)	Graph Algorithms
Week 5 (3/28, 4/2)	Termination Detection
4/4	Midterm exam
Week 6 (4/9, 4/11)	Mutual Exclusion
Week 7 (4/16, 4/18)	Deadlock Detection
Week 8 (4/23, 4/25)	Global Predicate Detection
Week 9 (4/30, 5/2)	Distributed Shared Memory
Week 10 (5/9, 5/14)	Consensus and Agreement
Week 11 (5/16, 5/23)	Replication and Consensus: Paxos
Week 12 (5/28, 5/30)	Distributed Key-Value Store: Amazon Dynamo
Week 13 (6/4, 6/11)	Distributed File Systems: Google File Systems
Week 14 (6/14)	Distributed Database: Google Spanner