COP 6930 - Distributed Algorithms

- **Catalog Description**:

  Prerequisite: A high-level programming language, basic knowledge of computer architecture and operating systems, deep understanding of algorithm design and analysis, or permission of the instructor. This course covers baiscs of distributed computer systems and distributed algorithms, with a focus on the latter. Discussion of special issues related to distributed control such as election, mutual exclusion, communication, consensus, resource allocation, logical time and synchronizers.

- **Textbook**:

  1. *Distributed Algorithms*
     Nancy A. Lynch, Morgan Kaufmann Publishers, Inc., 1996

- **References**

  1. *Distributed System Design*
     Jie Wu, CRC Press, 1999.
  2. *Distributed Systems: Principle and Paradigms*
     Andrew S. Tanenbaum and Maarten Van Steen, Prentice Hall, 2002.

- **Instructor**:

  Dr. Jie Wu, Professor of Computer Science and Engineering
  jie@cse.fau.edu, http://www.cse.fau.edu/~jie

- **Goals**: The student will get exposed to fundamental issues in distributed algorithm design, recent development, and research trends in this area.

- **Class time**: M-W 4:30 PM - 5:50 PM

- **Office hours**: M-W 2:30 PM - 4:30 PM (S&E 410)

- **Prerequisite by topic**:

  1. Basic concepts of computer architecture and operating systems
  2. Knowledge of a high level programming language
  3. Deep understanding of algorithm design and analysis

- **Topics**:

  1. Introduction and motivation
  2. Distributed systems vs. distributed algorithms
  3. Different modelings: synchrounous, asynchrounous, and partially synchronous models
  4. Sample distributed algorithms
     (a) Leader election
     (b) Consensus
     (c) Mutual exclusion
     (d) Synchronizers
     (e) Logical time
     (f) Snapshots
     (g) Resource allocation
  5. Applications in distributed systems