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CMPT 855 - COMPUTER NETWORKS AND DISTRIBUTED SYSTEMS

Department of Computer Science UNIVERSITY OF SASKATCHEWAN

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CMPT 855

Department of Computer Science

University of Saskatchewan

2011-12, Term 2

Course Description

This course is intended to provide advanced graduate-level coverage of distributed sensor systems in Computer Science, particularly in wireless sensor networks. The unique characteristics of sensor data traffic will be examined with a view on reducing load through signal analysis, aggregation and routing techniques. This course will necessarily touch on a range of topics including but not limited to network protocols, signal analysis, artificial intelligence and databases.

Prerequisites

Graduate Student in Computer Science or Permission of the Instructor.

Lecture Information

Wednesdays 9:30-12:30, Thorvaldson 386

Instructor Information

Instructor: Kevin Stanley

Contact: kevin.stanley@usask.ca

Office Hours: By appointment

Textbook Information

Required Text

- F. Zhao and L. Guibas, *Wireless Sensor Networks: An Information Processing Approach*, Morgan Kaufman, 2004

Lecture Topics

1. Physical models and limitations of common sensors
2. Core sensor concepts including accuracy, repeatability and bandwidth
3. Basic Sensor Analysis

4. Sensor Network Fundamentals

1. Self-Organization
2. Routing in static networks

- i. Standard Routing
- ii. Distributed Routing
- iii. Geographic Routing

1. Aggregation and compression
2. Sensor Data Analysis and Fusion

1. Frequency Filtering
2. Kalman Filtering
3. Participle Filtering
4. Adaptive Measurement
5. Topics is Sensor Network routing and aggregation

1. Sensor Localization
2. Delay Tolerant Wireless Sensor Networks
3. Sensor Placement

PoliciesMissed Examinations

1. "Students who have missed an exam or assignment must contact their instructor as soon as possible. Arrangements to make up the exam may be arranged with the instructor. Missed exams throughout the year are left up to the discretion of the instructor if a student may make up the exam or write at a different time. If a student knows prior to the exam that she/he will not be able to attend, they should let the instructor know before the exam."
2. "Final exams - a student who is absent from a final examination through no fault of his or her own, for medical or other valid reasons, may apply to the College of Arts and Science Dean's office. The application must be made within three days of the missed examination along with supporting documentary evidence. Deferred exams are written during the February mid-term break for Term 1 courses and in early June for Term 2 and full year courses."

(2007/08. <http://www.arts.usask.ca/students/transition/tips.php>)

Incomplete Course Work and Final Grades

"When a student has not completed the required course work, which includes any assignment or examination including the final examination, by the time of submission of the final grades, they may be granted an extension to permit completion of an assignment, or granted a deferred examination in the case of absence from a final examination. Extensions for the completion of assignments must be approved by the Department Head, or Dean in non-departmentalized Colleges, and may exceed thirty days only in unusual circumstances. The student must apply to the instructor for such an extension and furnish satisfactory reasons for the deficiency. Deferred final examinations are granted as per College policy.

In the interim, the instructor will submit a computed percentile grade for the course which factors in the incomplete course work as a zero, along with a grade comment of INF (Incomplete Failure) if a failing grade. In the case where the instructor has indicated in the course outline that failure to complete the required course work will result in failure in the course, and the student has a computed passing percentile grade, a final grade of 49% will be submitted along with a grade comment of INF (Incomplete Failure).

If an extension is granted and the required assignment is submitted within the allotted time, or if a deferred examination is granted and written in the case of absence from the final examination, the instructor will submit a revised computed final percentage grade. The grade change will replace the previous grade and any grade comment of INF (Incomplete Failure) will be removed.

For provisions governing examinations and grading, students are referred to the University Council Regulations on Examinations section of the Calendar.

(2007/08 University of Saskatchewan Calendar/Exams & Grades/Grading System)

Department Policy on Academic Honesty

Students are expected to be academically honest in all of their scholarly work, including course assignments and examinations. Academic honesty is defined and described in the Department of Computer Science Statement on Academic Honesty (http://www.cs.usask.ca/content/academic_honesty/academic_honesty.jsp) and the University of Saskatchewan Academic Honesty Website (<http://www.usask.ca/honesty>).

The Student Academic Affairs Committee treats all cases according to the University Policy and has the right to apply strict academic penalties (see http://www.usask.ca/university_secretary/honesty/academic_misconduct.php).

Student Evaluation

1) Grading Scheme

1. Assignments 30% (15% each)
2. Class participation 20%
 1. Leading Discussion 5%
 2. Participating in Discussion 10%
 3. Paper summaries 5%
3. Project Proposal 10%
4. Final project 40%
 1. Presentation 10%
 2. Paper 30%

2) Attendance expectations

You are expected to attend all lectures and labs. No notes on the lectures or labs will be made available by the instructor, so if you do miss a class it is up to you to catch up with the help of one, or more, of your peers.

IMPORTANT! Please read:

1. All students must be properly registered in order to attend lectures and receive credit for this course.
2. Failure to complete required course work will result in failure of the course.

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