EEL 6935: Cloud Computing and Storage (Fall 2014)

Announcements:

- We are using the e-learning course management system, https://lss.at.ufl.edu/ (http://elearning.ufl.edu/). Go to the Learning Support Services homepage, click “e-Learning Login” button, and enter your GatorLink username and password.

Syllabus

Instructor:

Dr. Xiaolin (Andy) Li
Office: 433 NEB
Office Hours: TR 2pm-3pm
Email: andyli-at-ece (suffix .ufl.edu)
Web: http://www.andyli.ece.ufl.edu/

Teaching Assistants:

Mr. Min Li
Office: 406 NEB
Office Hours: MW 2pm-3pm
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Mr. Ze Yu
Office: 406 NEB
Office Hours: MW 3pm-4pm
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Class Meeting Time and Place:

Time: T 3pm-3:50pm, 4:05pm-4:55pm; R 4:05pm-4:55pm
Place: 211 MAEB

Course Objective and Description:

Using large-scale computing systems to solve data-intensive real-world problems has become indispensable for many scientific and engineering disciplines. This course provides a broad introduction to the fundamentals in cloud computing and storage, focusing on system architecture, programming models, algorithmic design, and application development. Selected scientific applications will be used as case studies.

Prerequisite: introduction to programming or data structures and algorithms (EEL4834)
or equivalent), and Principles of Computer System Design (EEL-5934 or equivalent) or computer architecture (EEL5764 or equivalent), proficiency in Java, or instructor approval.

Textbook:


Other References:

- Many recent papers in leading conferences/journals will be discussed.
- Hadoop YARN, Arun Murthy, Vinod Kumar Vavilapalli, Doug Eadline, Jeffrey Markham, Joseph Niemiec, Addison Wesley, 2014.
- Data-Intensive Text Processing with MapReduce, Jimmy Lin and Chris Dyer, 2010. (PDF version available online)
- Programming Amazon EC2, Jurg van Vliet and Flavia Paganelli, O'Reilly Media, 2011.
- Programming Google App Engine, Dan Sanderson, O'Reilley, 2012.
- Distributed and Cloud Computing: From Parallel Processing to the Internet of Things by Kai Hwang, Jack Dongarra & Geoffrey C. Fox, Morgan Kaufmann, 2011.
- The Fourth Paradigm: Data-Intensive Scientific Discovery, Tony Hey, Stewart Tansley, and Kristine Tolle, Microsoft Research, 2009. (PDF version available online)

Course Homepage:

http://www.andyli.ece.ufl.edu/teaching/cloud

Course Outline (tentative):

1. Introduction and Overview
2. Programming Paradigms
3. Introduction to Hadoop, YARN, Spark
4. MapReduce Runtime Management
5. Algorithm Design and Implementation in MapReduce
6. Consistency and Coordination
7. NoSQL and NewSQL
8. Enhancements to MapReduce
9. Distributed File Systems
10. Case Study
Grading Policies:

- Class participation and contribution (bonus): 5%
- Homework assignments, reading summary, and paper presentation: 50%
  - Programming assignments (30%)
  - Reading Summaries (10%)
  - Paper Presentation (10%)
- Course Project: 50%
  - Proposal (10%)
  - Midterm Presentation (10%)
  - Final Presentation and Demo (15%)
  - Final Report (15%)

Note: Homework and programming assignments are due by 11:59pm of the due date (unless announced in class otherwise). Late homework (non-programming) will NOT be accepted. Late program penalty is 10% per day, according to the timestamp of your online submission. Only when verifiable extenuating circumstances can be demonstrated will extended assignment due dates be considered. Verifiable extenuating circumstances must be reasons beyond control of the students, such as illness or accidental injury. Poor performance in class is not an extenuating circumstance. Inform your instructor of the verifiable extenuating circumstances in advance or as soon as possible. In such situations, the date and nature of the extended due dates for the assignments will be decided by the instructor.

Attendance Policy:

Attendance is required. Students are responsible for any material covered in class. Lots of the materials covered in class will not be in the textbook. Announcements about homework, projects, programming assignments, etc. may be made in class or online or by emails. Students are encouraged to check the course Sakai system regularly.

Collaboration Policy:

Discussion of techniques and ideas covered in class is encouraged. However, every line of all assignments must be your own (or your team's). In programming assignments, discussion of techniques in a natural language (such as English) is allowed, but a discussion in a computer or algorithmic language is not allowed. (Computer language discussions and questions are to be limited to the language and should not concern the assignment.) Stealing, giving or receiving any code, drawings, diagrams, texts or designs (from others or Internet) is not allowed. Project reports should be written in your own words; apparent copy (ONE sentence or more) is assumed as plagiarism, if not quoted. Students who do not comply with the above described collaboration policy will receive a grade of F in the course. Furthermore, the case will be reported to the University Officials.

Honesty Policy

All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work
submitted and exams taken in this course and all others.

**Accommodation for Students with Disabilities**

Students Requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.

**UF Counseling Services**

Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

- University Counseling Center, 301 Peabody Hall, 392-1575, Personal and Career Counseling.
- SHCC mental Health, Student Health Care Center, 392-1171, Personal and Counseling.
- Center for Sexual Assault/Abuse Recovery and Education (CARE), Student Health Care Center, 392-1161, sexual assault counseling.
- Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.

**Software Use**

All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.