

CIS 6930

Fall, 2020

Syllabus

Course Title: Network Data Streaming
Credits: 3
Instructor: Shigang Chen
Office: CSE E452
Tel:
Office Hours: Monday 10:30am – 12:30pm (Zoom)
Email: sgchen@ufl.edu

Class Room: Online Video
Class Hours: Asynchronous

TA: N/A
Location:
Office Hours:

Prerequisites

Data Structures and Algorithms, Computer Networks

Objectives

This course covers algorithms and data structures for Internet-related data streaming as well as selected topics on the most recent development in the networking research community. The students are expected to learn network algorithms and data structures through lectures, while being exposed to the larger networking field through literature reading and presentations. Moreover, the students are also expected to complete a course project that implements a number of network streaming algorithms. The course provides a framework under which students will learn the start of the art in network data streaming research and perform hand-on work through implementation.

Course Content and Schedule

Week 1: (August 31 – September 4)

Syllabus, Introduction to Network Data Streaming, Flow Model and Hash Table

Week 2: (September 8 – September 11)

Cuckoo Hash and Multi-hash Table, D-left Hash and D-left Cuckoo Hash, Bloom Filter

Project 1 handout: hash tables and related

Week 3: (September 14 – September 28)

Counting Bloom Filter and Bloomier Filter, Mutiset Bloom Filters, Multiset Classification

Project 2 handout: Bloom filter and related

Week 4: (September 28 – October 2)

CountMin and Counter Update, Counter Sketch, Counter Braids

Project 3 handout: CountMin and related

Week 5: (October 5 – October 9)

Virtual Counters, Counter Tree, Probabilistic Counting

Week 6: (October 12 – October 16)

Multi-resolution Bitmap, FM Sketch, HLL Sketch

Week 7: (October 19 – October 23)

Virtual Bitmap, Virtual FM, Virtual HLL

Project 4 handout: Virtual Bitmap and related

Week 8: (October 26 – October 30)

Bloom Sketches, Virtual Sketches, Super kJoin Sketches

Week 9: (November 2 – November 6)

Non-duplicate Filtering, Paper handout, Student Presentation 1-2 and Recap

Week 10: (November 9 – November 13)

Student Presentation 3-8

Week 11: (November 16 – November 20)

Student Presentation 9-14

Week 12: (November 23 – November 27, holidays 11/24 – 11/27)

No Class

Week 13: (November 30 – December 4)

Student Presentation 15-20

Week 14: (December 7 – December 9)

Research papers due on December 8

Course Format

The course consists of four components. The first component is lecture, which happens during the first two thirds of the semester. The instructors will cover the streaming algorithms listed in Course Schedule. The second component is course projects. The third component is a presentation where the paper is assigned by the instructor. The fourth component is a research paper assignment that each student needs to complete independently.

Grading:

Individual Projects 60
Presentation on Selected Paper20
Research Paper 20

There are four software projects on a series of algorithms covered in the course.

The papers to be presented by the students will be selected by the instructor. For scoring, the 20 points are distributed as follows: 5 points for problem motivation, 5 points for precise problem definition, 5 points for related work, and 5 points for solutions.

For the research paper, the instructor will give a subject, but the students are free to pick their own subjects instead.

Final Total Score (out of 100)	Letter Grade
92 or above	A
88-91	A-
85-87	B+
80-84	B
75-79	B-
70-74	C+
65-69	C
60-64	C-
56-59	D+
53-56	D
50-53	D-
Below 50	F

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.

Recording Policy:

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.