2023 Fall: CS 6204 Advanced Topics in System Software for Modern Storage Systems

Instructor

Sam H. Noh (samhnoh@vt.edu)

Course Overview

This is a **research-oriented** seminar course with a major course project. You will be expected to do a project and write a paper related to the project.

This course focuses on discussing important and interesting systems papers covering key topics related to system software for modern storage systems. We will take time to look back at some old technologies (still in use today) but will mostly focus on new emerging topics in storage systems. Specific topics will include modern memory/storage devices, buffer cache algorithms, indexing structures, file systems, Key Value Stores (KVS), computational storage, etc. Specific papers to be discussed are TBA. We will discuss 1-2 paper(s) each lecture. By the end of this course, you should be able to understand how the storage landscape has evolved to what it is today.

Schedule/Reading List

The tentative list of the reading list is here.

Class Participation I: Paper Reviews

Students will be required to read the papers and submit “reviews” of these papers before class. These reviews should include the following:

- Summary (one paragraph length)
- Short list (< 4 each) of pros and cons of the paper
- Detailed comments and questions of all parts of the paper
- A list of questions that you would like the authors to answer (rebuttal questions)
- Overall rate you give for the paper

Class Participation II: Paper Discussions

During the class, each of the papers will be discussed. A lead student will be assigned for each paper, who will start by presenting a summary of the paper and then lead the discussions. As each student has an assessment of the paper, each student will discuss and argue based on their own assessment. That is, for example, why you think that the contributions as what you assessed them to be and why the questions you posed are important. Essentially, everyone should be sharing each of the points that you made in the review.

Projects

Each student (or a team of students) must propose and conduct a project. Essentially, the project is simply a reproduction of (or a part of) the experiments conducted in papers in our reading list or a paper that is referenced in or relevant to a paper in the reading list. For PhD students, you will be expected to do a bit more as in extending the work in some extent. You should consult with the instructor as you consider your potential project.

The proposals will be presented in class, and the tentative plan is to end all presentations by mid October. As a final outcome, you will be expected to submit a report and do a presentation of your experiments and their results.

Grading

- 25%: Paper Reviews
- 25%: Paper Discussions
- 10%: Project Proposal
- 40%: Final Project Report and Presentation