CS 395T Prediction Mechanisms in Computer Architecture

Classes:	Fridays 10:00-noon, GDC 5.516
Unique number:	52650
Piazza Page:	http://piazza.com/utaustinx/spring2023/cs395tlin

Instructors

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Office Hours:	MW 3:30-4:15	F 12:00-1:00	

Course Objectives. This research-focused course will explore uses of prediction to improve hardware performance. Our goal is to understand the state-of-the art, to understand basic concepts and mechanisms for performing prediction, including machine learning, and to identify new ideas for advancing the state-of-the art. We will focus on caching and data prefetching, but students may pursue other topics in computer architecture if they are interested.

This year, we will work towards the theme of applying these ideas to large multi-core systems, though your course project does not necessarily need to follow this theme. We will revisit old papers in this area and explore new ideas that arise from changes in technology.

Workload. The workload will be moderate to heavy:

- We will read and discuss one or two papers per week. Everyone is expected to read and actively participate in the discussion of these papers.

- There will be a course project that will likely pursue some new idea. (We have lots of suggestions.)

- There will be brief oral presentations and progress reports.

- There will be a few assignments whose goals are to prepare students for their projects.

Text. There is no text book.

Prerequisites. An undergraduate or graduate computer architecture course. Facility with C/C++.

Grading.

Classroom participation	15-25%
Readings and assignments	25%
Project	50-60%

Readings

For each assigned reading, you will submit a written response by 5:00pm two days before the class meets. You have great freedom in your response, but the point is to encourage you to think critically about what you've read. You might ask clarifying questions, ask insightful questions, challenge assumptions, make new connections, contrast or relate the reading to other readings or programming assignments, identify aspects that you'd like to explore more deeply, or summarize the main points.

Class Communication. We will communicate using Piazza.

Office Hours/Open Door Policy. My door is usually open when I am in, so please feel free to come to my office whenever my door is open. (If the door is slightly cracked, consider it open.) In the rare case that my door is completely closed, **please do not knock** unless you have an appointment.

Assignment 0

Due: January 16.

Part 0: Join our Piazza group so that you can participate in online discussions about the course and the assignments:
> `http://piazza.com/utaustinx/spring2023/cs395tlin`

Part 1: Read and understand our class rules on Academic Dishonesty, including the University's rules on plagiarism (see below).

> If you have any questions about academic dishonesty or plagiarism, please post to the Piazza page (use Piazza's private message facility if you do not want your questions to be made public).

Part 2: Send a brief email message to the instructors.

(a) If you have any specific reason for taking this course or any particular topics that you would like to better understand, please let us know.

(b) Let us know if you have read and understood the University's rules on plagiarism. If you at any time you have questions that were not answered by the Piazza discussion, please let us know.

Scientific Ethics

We'll apply the usual standards of the scientific community: collaboration is encouraged but must be cited. Cheating, including plagiarism, will lead to failure of the course. The following site has more about plagiarism:

> `https://liberalarts.utexas.edu/rhetoric/first-year-writing/plagiarism-collusion.html`

Here are a few points of emphasis from this document:

- While it's clear that the use of verbatim material without proper attribution constitutes plagiarism, other types of material can be plagiarized as well, such as ideas drawn from an original source or even its structure (e.g., sentence construction or line of argument).

- Minor revisions to borrowed text amounts to plagiarism. So by merely changing a few words or rearranging several words or sentences, you are not paraphrasing; you are plagiarizing.

- Material that is copied or slightly modified is considered to be plagiarized even if the original work is cited as a reference. To avoid plagiarism, you need to both cite the work and make it clear that the text was originally written by others.