

CSCE 614
Computer Architecture
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Spring 2019

Project Guidelines

Each student needs to work on a term project for 20% of the course grade. Groups of two are recommended. Note that no more than two in a team is allowed. You must have group member names in your reports.

Report Type	Deadline
Proposal: It should present your initial thoughts and outline of the project. It should also include the proposed outcome of the work, outline the approach, and relevant references. Submit the soft-copy of the project proposal on e-campus, and hard copy in class. Proposal submission is individual on e-campus. Hard copy can be submitted one per group.	01/24/2019
Midterm Report: It should describe what you have done so far. You should have at least a clear idea about your project, be familiar with tools and frameworks that need to be used and prior work in this area. You should have at least some portions of your project implemented. Ideally, midterm report should be a halfway version of your final report.	03/19/2019
Final Report: It should describe your work in detail and have the format of a technical paper. In particular, it should include an abstract, introduction, description of your problem (including previous work), description of the proposed improvement, performance analysis, conclusions, and a list of references. Include all your work, all diagrams, simulation code, sample runs of your experiments/simulations, division of work (if more than one student participated) and other relevant information as appendices. Include the term project evaluation form (attached at the end) as the first page of the project report. Details about the submission instructions will be provided later. One hard copy needs to be submitted in class per group.	04/30/2019

Project Ideas

You are expected to do literature survey and come up with a suitable problem for the term project. The project should propose some sort of design improvement to CPU, ISA, compiler techniques, interconnection networks, or memory hierarchy and evaluate the same using a simulator or experiments on existing systems. Or the project can also characterize emerging applications such as Machine Learning, Virtual Reality, IoT workloads using simulator or existing systems, and conclude

architectural or system research implications. Here is a list of conferences to probe for ideas.

- International Symposium on Computer Architecture (ISCA)
- International Symposium on High-Performance Computer Architecture (HPCA)
- International Symposium on Microarchitecture (MICRO)
- Architectural Support for Programming Languages and Operating Systems (ASPLOS)
- International Conference on Measurement and Modeling of Computer Systems (SIGMETRICS)
- Annual ACM IEEE Design Automation Conference (DAC)
- International Symposium on Low Power Electronics and Design (ISLPED)

Examples

These are some of the projects that students did in the past.

- Implementing various neural network based prefetching schemes.
- Implementing different deep neural network architectures.
- Detecting different types of bugs using hardware support.
- Implementing various scheduling policies for GPU.
- Implementing various versions of transactional memory.
- Implementing/modifying various cache coherence protocols.
- Implementing some state-of-the art branch prediction scheme.
- Detecting various side-channel attacks/security attacks using hardware.

Report Format

Please use the following format:

<https://www.ieee.org/conferences/publishing/templates.html>

The page has both Word format and latex files. You can use either of them. If you use latex, use “conference” option in documentclass.

Simulators

You can use some of the most popular simulators used in literature. They are as follows:

- ZSim
- Multi2Sim
- ESESC
- Gem5

(Use this page as the first page of your report)

Name(s):

Project Title:

Date of Submission:

Evaluation	Max Score	Your Score
Overall Organization: Title, abstract (problem attempted, outline of your results, improvements), introduction (general description of the problem, motivation, related work, and goals), description of the related definitions and background, description of your work, experimental results, conclusions, appendices (your code may be included here).	10	
In depth description of the problem and its significance	10	
Techniques used and definitions (should be fairly self-sufficient)	20	
Description of your work and results	40	
Technical evaluation (soundness of approach and depth) of results	60	
Conclusions, summary of work, and directions for further work	15	
Appendices (if applicable)	5	
References	10	
Overall quality of report	30	
Presentation	50	
Total	250	