CSC467: Compilers and Interpreters

Jianwen Zhu

September 30, 2016

Course Info

<table>
<thead>
<tr>
<th>Instructor</th>
<th>Jianwen Zhu</th>
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<tr>
<td></td>
<td>312 Engineering Annex</td>
</tr>
<tr>
<td></td>
<td>jzhu at eecg.toronto.edu</td>
</tr>
<tr>
<td>TA</td>
<td>Reza Nakhjavani</td>
</tr>
<tr>
<td></td>
<td>reza.nakhjavani at mail.utoronto.ca</td>
</tr>
<tr>
<td></td>
<td>Jaffer Shehbaz</td>
</tr>
<tr>
<td></td>
<td>shehbaz.jaffer at mail.utoronto.ca</td>
</tr>
<tr>
<td></td>
<td>Zhao Xu</td>
</tr>
<tr>
<td></td>
<td>nuk.zhao at mail.utoronto.ca</td>
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<tr>
<td>Lecture</td>
<td>Mon 10-12 GB244</td>
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<td>Thu 10-12 GB244</td>
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<tr>
<td>Tutorial</td>
<td>Thu 01-02 BA2145</td>
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<td>Fri 05-06 HA410 on selected weeks</td>
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<td>Lab</td>
<td>Tue 09-12 GB243</td>
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<td>on selected weeks</td>
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Online Resources

Web Site http://www.eecg.toronto.edu/~jzhu/csc467/csc467.html

Important Dates

Oct 09 Midnight Lab 1 due
Oct 17 Midterm, in class
Nov 06 Midnight Lab 2 due
Nov 20 Midnight Lab 3 due
Dec 04 Midnight Lab 4 due

Tutorial Schedules

TUT1 TUT0101: Sep 29 13-14; TUT0102: Sep 30 17-18
TUT2 TUT0101: Oct 13 13-14; TUT0102: Oct 14 17-18
TUT3 TUT0101: Oct 27 13-14; TUT0102: Oct 28 17-18
Lab Schedules

Lab1  PRA0101: Sep 27 9-12; PRA0102: Oct 04 9-12
Lab2  PRA0101: Oct 25 9-12; PRA0102: Nov 01 9-12
Lab3  PRA0101: Nov 08 9-12; PRA0102: Nov 15 9-12
Lab4  PRA0101: Nov 22 9-12; PRA0102: Nov 29 9-12

Lecture Schedules

Lecture schedules can be found here

Office Hour

Please contact by email or during lectures to make appointment.

Prerequisites

You are presumed to have good knowledge of computer architecture and programming languages. Background in operating systems, and experience in programming with C will prove helpful.

Text Book


Machine Project

You are required to complete a machine project, in which you are to construct a mini OpenGL shader compiler for graphics processors. There will be 4 phases of the machine project, each of major scope. You are required to complete the majority of work of each phase in one of the corresponding labs scheduled, where you will receive helps from TAs. The detailed instructions for each lab will be posted separately. Deadlines for submitting the different phases of the project will be midnight of the following Sunday in the week where the lab is held.

The project will serve as an application of the theory presented in the lectures on a real machine. In particular, you will build a small compiler for a given version of a simple language. It will be implemented using the scanner generator Flex, the parser generator Bison and C language. It will produce assembly code.

You are allowed to work in groups of 2 students. It is your own responsibility to inform the teaching assistant about the list of students in your team at least one week before the handin of the first phase of the project. For the machine project you will need to work on the ecf lab machines. If you are engineering major, your account should have been already established. In any case, it is your own responsibility to meet Cathy Malbara (cathy@ecf.toronto.edu) with your student ID card so that you obtain the proper account.

The teaching assistant will discuss the format of the assignments. For every assignment you should handin: a description of which member of your team was responsible for each part of the work well written documentation for the work you did on the assignment. Documentation will worth at least 15% of the mark for each assignment.

The specification of the language can be found as follows.

MiniGLSL language description
ARB assembly language description
Demo
Screenshots
Some demos of the shader language can be founded here.

Demo1
Without Shader
With Shader

Demo2
Without Shader
With Shader

Lab 1
Spec Starter 1

Lab 2
Spec

Lab 3
Spec

Lab 4
Spec

Handouts
Tutorial 1
Shader tutorial and project review

Tutorial 2
Flex tutorial and Lab 1 review

Tutorial 3
Bison tutorial
Lec 2 Lec 3 Lec 4 Lec 5 Lec 6 Lec 8 Lec 11-12 Lec 13-14 Lec 15 Lec 16-18 Lec 19-23

Additional Readings
NFA Hardware
NFA-DFA Equivalence Proof
Storage Management
Standford Parser Notes 1
Standford Parser Notes 2
Standford Parser Notes 3
Past Midterm

Exams
There will be two comprehensive exams for this class: a 90min midterm and a 2:00hrs final. The exams will be based on material covered in the lectures (i.e., reading assignment), tutorials and the machine project. You are required to bring some form of valid picture ID. The dates and times of the exams will be announced in the newsgroup.

Grading Policy
The weighting scheme for the class requirements will be as follows:

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<tr>
<th>Requirement</th>
<th>Weight</th>
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<tr>
<td>Project</td>
<td>40%</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>20%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>40%</td>
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Minor lab downtime will not qualify for project extensions. Nuclear meltdown in the lab might qualify. To protect yourself, keep backups on the lab machines so if your computer crashes, you can recover.

Absence from any exam will result in a zero score unless it is due to an emergency and official documentation is provided.
Cheating Policy

Cheating is against “fair-play” and will not be tolerated under any circumstances. While the pressures of many classes, homeworks, work and/or extracurricular activities can be great, this is never an excuse for copying solutions from others. "Helping” somebody by allowing them to "borrow” your work is not doing them a favor either, but indicates your approval and active participation in such activities. The University holds among its highest principles the notion of academic freedom and integrity. If you are caught cheating it may lower your grade or it can even give you a fail grade for the class. If you think that there is an issue that influences your performance in the class then talk to the instructor.

Other References

The following textbooks are not required but they can serve as good reference material:

