

CISC 310 – Fall 2014

Final Project Assignment

The goal of this assignment is to give you the opportunity to explore an advanced operating systems topic in more depth than we are able to cover in class. You should pick something of interest to you and your partner since you'll be spending a substantial amount of time working on this project.

Option A: Research Paper

In this option you pick a topic related to modern operating systems and conduct online/library research on the topic. For this option you need to prepare a well written and well documented term paper (approximately 10 pages long). This paper is more than just a book report. The only topics that will be approved are those where you will be pulling from a variety of sources to explore an advanced topic – both in terms of the current state of the art, ongoing research, and how the topics we have covered in class are applicable. This is expected to be a significant intellectual effort.

Example topics:

- Current challenges in mobile OS development – can focus on one particular issue or several related ones. Should make sure you relate to the topics in class and compare/contrast several potential solutions/areas of ongoing research aimed at addressing the challenge(s) you discuss.
- Embedded, real-time operating systems (e.g. in cars, etc) – same details as above.
- OS for the home - what would an OS for a smart home look like? What are some related ongoing projects? What types of resources and special challenges would be faced by a smart home OS?
- File storage in the cloud – very large file systems (e.g. storing photos on Facebook, the Google file system) – what is the scale experienced by these types of sites? What special challenges come with that type of scale? What are some of the techniques currently in use and currently being developed?
- An advanced security topic (related to OS)
- Scheduling in distributed, heterogeneous systems (e.g. ad-hoc clusters for protein folding)

Option B: Simulation Building

In this option you choose an operating systems topic in which you would like to get more experience programming. You will design a simulation that can be used to explain and further explore the concept. In addition to the simulation, you will need to turn in a report (approximately 5 pages long) that includes any necessary background on your topic, and a description of your simulation and how it works.

Example topics:

- Comparison (simulation) of different scheduling algorithms– create simulations of different algorithms and run through experimental data sets to show the benefits and drawbacks of each.
- Comparison of multiprocessor scheduling algorithms
- Simulation of paging in virtual memory
- Simulation of various methods for ensuring mutual exclusion highlighting deadlock avoidance and resolution techniques

Option C: Wild Card

If you have an idea for a project that does not fit neatly into one of these two bins, please come talk to me and we'll see if we can work something out.

Presentation

With any of the three options, you will present your project in class at the end of the semester.

Details:

- Groups of 2 or 3 (NO MORE THAN 3)
- Topic must be approved by me by Monday, October 20 at 5:00 PM. All topics are to be posted to the topic forum on Blackboard.
- There will be several checkpoints during the semester to help you stay on track towards finishing your project in a timely fashion. All of these checkpoints will contribute to the final grade you receive