Prof. Jingke Li (FAB 120-06, li@cs.pdx.edu); Class: MW 2:00-3:50pm @ FAB 40-07; Office Hr: MW 1-2pm & by appt.

CS 415/515 Syllabus

Description

This is an introductory course to parallel programming. We'll provide a general parallel computing background (theoretical foundations, architectures, and recent trends), and help students to understand the challenges in parallel programming. The focus of the course will be on the principles of parallel programming. We'll cover all prevailing parallel programming models (data-parallel, task-parallel, shared-memory, message-passing, and partitioned-global-address-space), introduce the current crop of established parallel programming languages and libraries (Pthreds, OpenMP, and MPI), as well as some newer ones (*e.g.* OpenCL and Chapel). We'll study programming-related issues such as, locality, synchronization, memory consistency, speed-up, and performance, and examine some parallel algorithms from various application domains (*e.g.* numerical, sorting, and graphs). Finally, we'll provide students with a hands-on experience in programming both shared-memory and message-passing systems using several different languages.

Prerequisites

Working knowledge of computer architectures, compilers, and operating systems (i.e. CS321 & CS333 or the equivalent). Adequate programming skills in C. No prior parallel computation background is necessary.

Textbook

There is no required text book. Some papers will be assigned for reading.

Class Times and Location

Class meeting times are Mon & Wed 14:00 - 15:50; the classroom is FAB 40-07. The weekly meetings are divided into 3 hours of lectures and 1 hour of labs. The labs will be held in FAB 88-09; and it is optional for CS515 students.

Class Web Page

We'll use D2L (`d2l.pdx.edu`) as this course's on-line resource center. Lecture notes, assignment handouts, announcements, and other class-related materials will be posted there. There are also dropboxes for submitting your assignments, and forums for discussing class-related issues with other students.

To access D2L, you need to login with your PSU (Odin) login-name and password.

Assignments and Exams

There will be four programming assignments. All assignments' programs will be tested and graded on the CS Linux lab machines (`linuxlab.cs.pdx.edu`) or the multicore Linux server, `babbage.cs.pdx.edu`. (Details will be provided in the individual assignment's handout.)

There will be a midterm and a final exam, both will be open-book.

The grade distribution on homework and exams are 35% and 60%. The remaining 5% is credited for attendance.

Special Note: This is a mixed undergraduate/graduate course. Although the lectures and course materials are the same, the requirements on homework and exams will be higher for graduate students.

Academic Integrity

We follow the standard guidelines for academic integrity. It is permissible to discuss assignments with other students, but you must develop the solution yourself, unless collaboration is explicitly allowed. Do not, under any circumstances, copy any part of another person's solution and submit it as your own. Writing code for use by others, or using others' code in any form (even with their permission) will be considered cheating. Cheating on an assignment or exam will result in an automatic zero grade for that piece of work, and the initiation of disciplinary action at the University level. Please refer to `http://www.pdx.edu/dos/codeofconduct` for details of the general PSU Student Code of Conduct.