

CS621: Parallel and Distributed Computing

Fall 2009 (TTh: 2:00pm – 3:15pm) FB-B13

Instructor: Jun Zhang. E-mail: jzhang@cs.uky.edu. Tel: 257-3892.

Office: 763F Anderson Tower.

Office Hours: TTh: 1:00pm – 2:00pm, and by appointment.

Web Page: <http://www.cs.uky.edu/~jzhang/CS621/cs621.html>.

Objectives: To introduce parallel and high performance computing to people carrying out graduate work or expecting a career involving parallel and distributed scientific computations. Students will have hands-on programming experience using MPI on their own simulated parallel computers.

Prerequisites: Two 500 level computer science courses, or consent of instructor. Some background on computer architectures and scientific computing. No previous experience with parallel computers is necessary. However, programming skill in Fortran or C is required.

Important Changes from Previous Teaching: We will no longer use the supercomputers at the UK Computing Center for the assignments. Students must have their own machines (PC or whatever machines) to run a version of MPI to simulate parallel and distributed computations.

Reference Text Book: *Introduction to Parallel Computing*, by Kumar, Grama, Gupta and Karypis, Benjamin Cummings Publishing Co., 2nd Ed., 2003.

Using MPI: Portable Parallel Programming with the Message-Passing Interface, by William Gropp, Ewing Lusk, and Anthony Skjellum, 2nd Ed., 1999.

Topical outline (tentative, Chapters 1 - 5):

- Parallel and high-performance computers;
- Models and parallel computers;
- Basic communication operations;
- Performance and scalability;
- MPI and OpenMP programming;
- Basic matrix computations;
- Direct methods for systems of linear equations;
- Applications.

Grading: Programming projects and homeworks (30%); One Midterm (October 27, Tuesday) (35%); Final Project (Tuesday, December 8) (35%). Final grade: A: 100 - 90, B: 89 - 76, C: 75 - 60, E: below 60.