# CSC 7220: Parallel Computing II: Algorithms and Applications
# ECE 7610: Advanced Parallel and Distributed Systems
# Term Project
# Winter 2014

**Assigned:** Monday March 3, 2014

**Deadlines:** Wednesday April 16, 2014, 5:00pm

**Requirements:** Develop an MPI program that implements the parallel quicksort algorithm presented in the textbook (the message-passing formulation: page 409-410). You should implement at least two methods for selecting the pivot for your parallel algorithm implementation. Analyze the performance of the two pivot selection methods and make recommendations on which method should be selected in practice and why.

You should also implement the sequential quicksort algorithm and use it for performance comparison. You should evaluate the performance of your parallel algorithm on sequences of 1 million integers generated randomly. The numbers should be generated at one process and distributed to all the other processes. You should run your program on the WSU grid by considering 4, 8, 12, and 16 processors. You should report the execution time, speedup and efficiency.

You are required to submit all the files containing your source code, the makefile, the job script, and the output file. These files should be submitted using the Blackboard drop box. You should also write a project report (as described below).

**Project Report:** It should describe your work in detail and have the format of a conference paper. It should contain an abstract, introduction, description of the problem, your work and contributions, conclusion and a list of references. You should provide plots supporting your performance analysis study. All your work such as hard copies of the source codes, sample test runs or any other relevant information should be included as appendices. The length of this report should be between 10 and 20 double spaced pages. The project should be submitted as hard copy by the deadline.