CSC 415: Parallel Computing

Introduction

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Welcome!

- Instructor
  - Marco Alvarez

- Lectures
  - MWF 9-9:50p @ Tyler 108

- Office Hours
  - TBA @ Tyler 257

Prerequisites

- CSC 301
  - implies programming and data structures

- Proficiency in at least 1 programming language
  - will mostly use C/C++ and eventually Python

- Ideally:
  - CSC 411 and CSC 412

Tentative List of Topics

- Computer Organization (review)
  - Instruction Set
  - Processor Architecture
  - Performance
  - Memory Hierarchy

- Operating Systems (review)
  - Processes
  - Threads
  - Synchronization

- Parallel Programming Platforms
  - Architectures
  - Memory
  - Communication
  - Topologies

- Message Passing
  - Send and Receive
  - MPI
  - Topologies
  - Communications

- Shared Address Space Platforms
  - Threads
  - Pthreads
  - Synchronization
  - OpenMP

- GPUs
  - Architecture
  - CUDA

- Parallel Algorithms and Applications
  - Dense Matrix Algorithms
  - Sorting
  - Graph Algorithms
  - Search Algorithms
Recommended Textbooks

Grading (subject to change)

- Assignments
  - 5 assignments (40%)
  - (interactive grading)

- In-class Presentations (30%)
  - special topics

- Exams
  - midterm 1 (15%)
  - midterm 2 (15%)