ECE408 / CS483/CSE408 Fall 2022

Applied Parallel Programming

Lecture 26: Course Retrospective

Course Reminders

- Labs
  - Full set of grades will be available by Friday. Please review
- Project
  - PM3 is due this Friday Dec 1st
  - Competition finishes on Fri Dec 8th
- Midterm Exam 2
  - Tuesday 7-9pm December 5th
  - In Person, same rooms, 1 sheet of notes (8.5x11inch, handwritten)
  - Non-internet connected calculator is allowed

ECE 408 Retrospective: What did we do this semester?

- Elementary Computational Patterns
  - Matrix Multiply, Convolution, Reduction, Scan, Histogram, Sparse Representations
- Parallel Optimization
  - Threading, Memory Management, Coalescing, Thread Divergence, Task Management, Profiling
- Programming Systems
  - CUDA, (OpenCL, SYCL, Hip, DPC++)

Thread Granularity

Fine Grained
Single Code Flow
Loop Oriented
Simple Sync/Sharing
Parallel Potential (1Mx?)

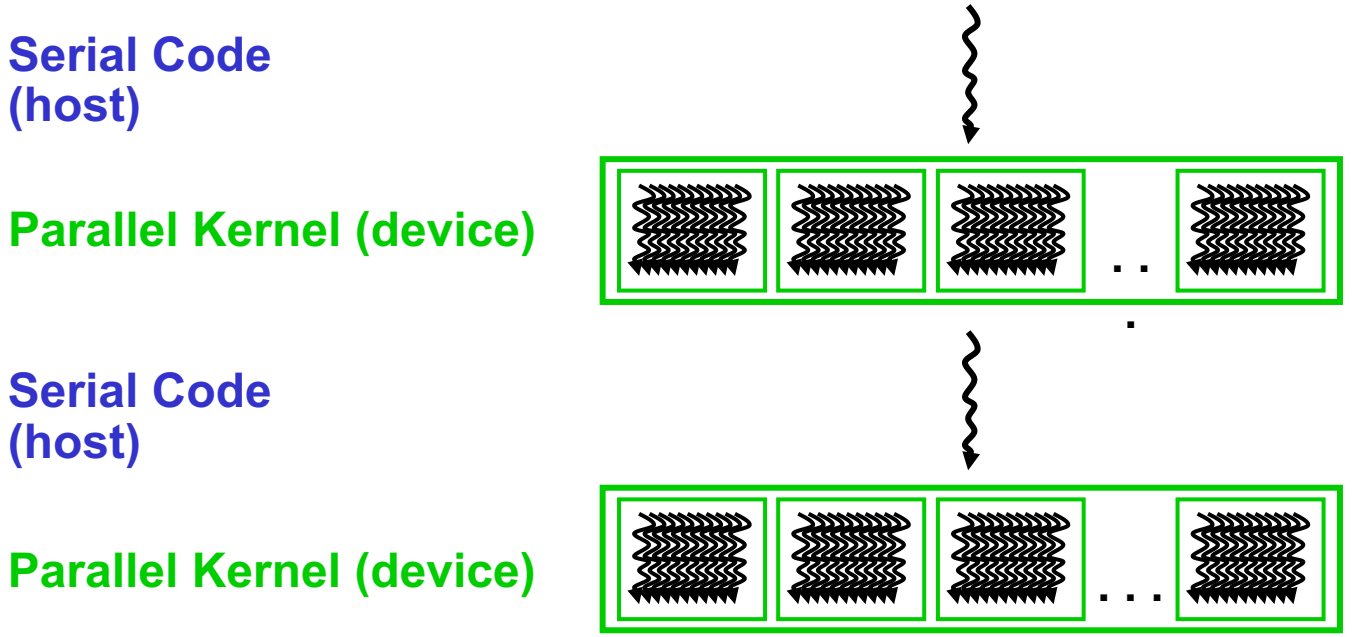
GPU / Accelerators
CUDA, SYCL, Hip, etc

Coarse Grained
Multiple Independent Flows
Task Oriented
Complex Sync/Sharing
Parallel Potential (50x?)

CPU MultiCores, Clusters
OpenMP, MPI

Bulk Synchronous Model Contributed to the Success

- In bulk synchronous, barriers separate temporal regions of code. interleaving / data sharing occurs only within regions (called phases).



If this is exciting to you…

- Courses in Advanced Computing: ECE 508, ECE 511, CS 533
- Computational Science: CSE 401
- Topical Courses: Bioinformatics, Machine Learning / AI, Scientific Computing, Material Science