CS 475 Projects

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Project Goals

- Apply the methods you learned so far to “something substantial.”
- Use the principles and extrapolate them to scale
- Tackle something that someone cares about enough to seek an improved performance.
- Have fun (the most important goal)
Grading Rubric (overall 15%)

- Initial study (3%)
- The work itself (9%)
  - Methods Used
  - Effectiveness
  - Iterations
- Poster Presentation (3%)

Initial Study (100 pts)

- Form a team (10)
  - Who you are
- Pick an application and platform (10)
  - What is the problem and why is it important
  - Justify the target
- Study the code (30)
- Measure baseline performance (30)
- Set yourself a target, with justification (10)
- Write this up (10)
  - Tell a story
Work Itself (100 pts)

- Loop through the iterative process
  - Try to get low hanging fruit first
- Keep a log
  - Things that you try initially may not work, but may become applicable after other things are done
- Keep track of lessons learnt
- Look back (how much the performance improved)
- Look ahead (how far to the machine peak)

Poster Presentation (100 pts)

- Thursday Dec 12
- CSB 3rd floor open area
- Set up posters by 10:00 AM.
- Be present during class time (and any other time you are free)
- Mingle interact
- Take down at 3:30
Sample projects

- DoE (Department of Energy) Exascale project(s)
- piRNA and its ilk (all source code is available)
  - piRNA 96 * (N*M)^6 double precision floating pt
  - BPMax 2 * (N*M)^6 and only does max-plus on ints (maybe even shorts)
  - BPPart 10 ** (N*M)^6
- Back Propagation Learning
  - Challenge: get as close to TMP as possible
- Non-negative matrix factorization
- CUDA MMScan++