Group size for this homework and the project is unrestricted, see below.

Proposals

Propose an interesting final project. The final project should be performance related, incorporating one or more areas discussed in class (or performance considerations relevant to some problem not discussed in class). This homework should briefly describe the problem and context and the performance related aspects.

The group size for the project is up to you. The amount of work should be proportional to the number of people in the group. Only one writeup of the proposal is necessary for your group.

You should describe the test environment and performance measurements you plan to do. This includes, if applicable, what baseline measurements are.

Turning in

Turn in by email (text/html is fine, or by attached pdf) to lenharth@ices.utexas.edu.

Meetings

Arrange meeting times next week to discuss the proposal. Office hours are ideal, but other times can be arranged by email.

This homework is not complete until you have talked to me. Arrange a time after you hand it in.

Projects Ideas

Take a real program of some note and optimize it by applying vectorization, cache and data-layout optimizations, or parallelization to some performance critical portion.

- Implement any of the algorithms used in the projects on a GPU.
- Parallelize a non-trivial (ideally irregular) algorithm.
- Analyze the scalability of existing parallel code.
- Implement an offline algorithm with asynchronous IO (e.g. text diff).
- Investigate Head-of-line blocking in either IO or network (related: buffer bloat). Construct tests or simulations showing the effect on latency and bandwidth.