

COMPUTATIONAL MATH, SCIENCE AND ENGINEERING DEPARTMENT

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Me

CMSE 822, Parallel Processing

Let's get started

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Me

Bill Punch:

- grad of THE Ohio State University
- ugrad BioChem/Chem
- Area is AI, Evolutionary Computation
- CMSE Grad Director
- Associate Director, HPCC
- Associate Prof, CMSE (long time CSE faculty as well)

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Teaching Assistant

Nathan Haut

Took this course last year in the same kind of setup.

We will schedule his office hours, probably zoom, soon

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We are Full!!

The original limit of the class was something like 35, I opened it up to the limit of seats in the room.

That's as big as we can get. If you are trying to add, you'll have to wait until someone drops.

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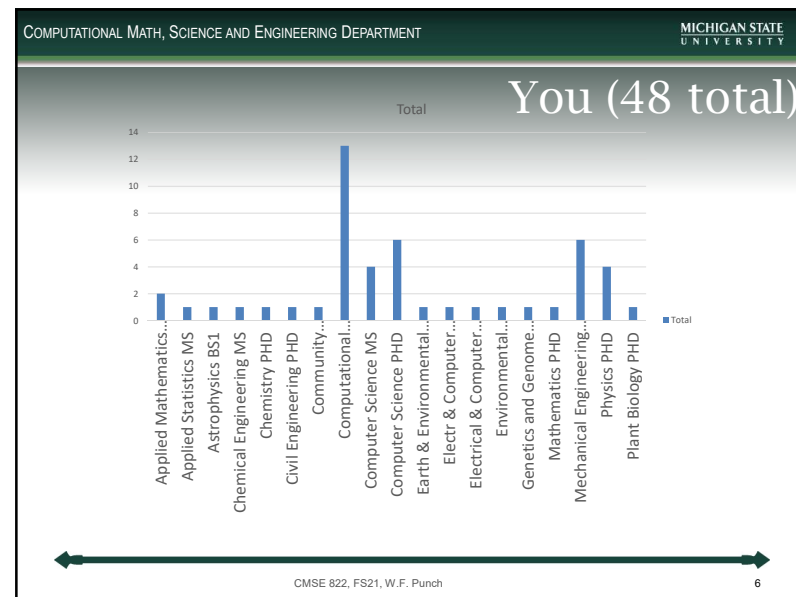
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Everything off the web page

<https://msu-cmse-courses.github.io/cmse822-FS21/>

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Covid

Let's get this out of the way:

- At this moment, we are in-person
 - masks required in-doors
 - vaccines up to a certain level
 - fill out the form (see the Syllabus)
- We are going to follow the rules of the university going forward
 - if you need an exemption, there's a form
 - see the Syllabus

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What if we have to Pivot

Let's continue in an honest tone. I believe there is a 50/50 chance that we will have to pivot during the semester.

Class is setup to make that straight-forward. We can do it if we have to. When we have to we'll figure it out.

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If you are sick, stay home

If you are ill, let me know. We can work out working online temporarily.

Don't just disappear, let me know!

If I get sick, we may have to work off zoom for a week or so.



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Syllabus

Let's take a look




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D2L for handin

- I know that other CMSE classes like to use git, and I think it's a great tool, but it is a tool with a purpose
- Git is good for multiple people doing development work in concert
- Git is not a CMS/handin system




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Why are we here?

There are a couple of reasons to want to study parallel processing:

- theory
- CS hardware software
- go fast!



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Going fast

We want to walk a fine line between all the CS level stuff and the practical stuff that can help you solve problems.

We have to do a little of both

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Why do I need all these details?



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Ariel Atom



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Ariel Atom

For traversing a Formula 1 type course the Atom is one of the fastest commercial cars available.

Wicked fast. And reasonably priced (starting at \$80K).

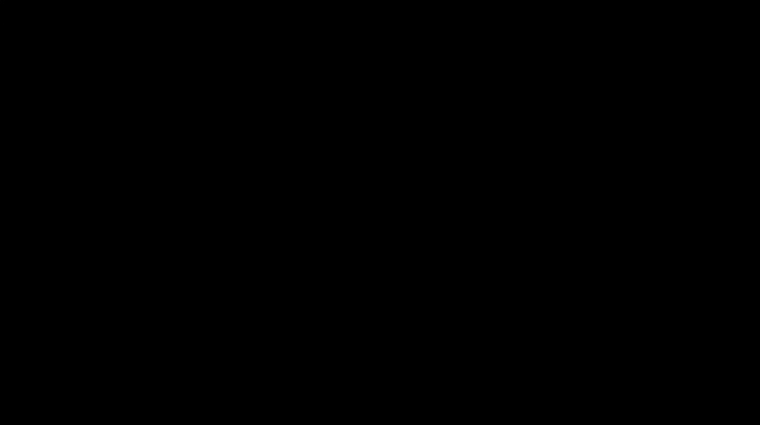
<https://www.arielna.com/arielatom>

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<https://www.youtube.com/watch?v=mbsYPXAJhxU>




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We look at details to go fast

To build a fast car, reasonably priced, you find the essence of what makes a good car and build that.

To build a fast program/parallel program, you have to understand how the program runs.



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C++

There are lots of languages out there, why work with C++?

"Because you're a C++ programmer, there's an above-average chance you're a performance freak. If you're not, you're probably sympathetic to their point of view (If you're not at all interested in performance, shouldn't you be in the Python room down the hall?)"

Effective Modern C++, Scott Meyers




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C++, fast and modern

- C/C++ is the standard by which the speed of most programming languages is gauged ("nearly as fast as C/C++")
- C++ is a modern, developing language (4 major updates since 2011)
- Most performance toolkits use C/C++



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C++, but not too much

Like hardware, C++ is useful but our job is not to become C++ wizards. I want to hit a few high spots that I think will be helpful, but a full language tour would take a full semester and that is not us.



Do the survey

As long as we are in person we will do programming and other exercises in small groups.

I'll form the groups, based on experience.

Do the survey!

