

Lecture 4: Deliver an Elevator Pitch

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Your Idea #1

- ☐ **Problem:** many bikes are being stolen; even though you can use heavier locks, thieves can eventually cut through and get away with expensive bike
- ☐ **Objective:** improve the locks from computer engineering perspective
- ☐ **Solution:** create a lock that, on top of being thick so it takes time to cut through, have sensors on the lock that can alert the owner if they have been triggered.

Your Idea #2

- ☐ **Problem:** Even though there are a lot of self defense tools, still every harassment and abductions exist
- ☐ **Objective:** Improve safety tool to make sure those people get help as soon as possible
- ☐ **Solution:** Just like how some elderly carry a simple button that they press every time they are in need of help, this safety button for self defense will have a GPS tracker and pre-defined contacts for emergency, you only need to press the button and your emergency contacts will get notified just like an amber alert.

Your Idea #3

- ☐ **Problem:** When you go out of town, you have to get someone to take care of aquariums for you.
- ☐ **Objective:** Design a system to automate this process
- ☐ **Solution:** The fish tank could automatically drop the required amount of food into the tank at the appropriate times. Also, there could be a lamp that turns on and off for the morning and night as well as adjusts in brightness to keep the water at the desired temperature. The temperature could be read from a sensor. Another sensor could be monitoring the toxicity of the water to let you know when the tank needed to be cleaned.

Your Idea #4

- ☐ **Problem:** I have a powerful GPU, a GTX 1070 Ti, but not a very good cooling system for it.
- ☐ **Objective:** monitors GPU's temperature and notifies my when the temperature gets too high, too the point that my PC would crash.
- ☐ **Solution:** There is software that already handles this, but I could also create my own circuit that does this. This wouldn't be too hard. It would involve a thermistor, which is a variable resistor based on temperature. (Or a temperature sensor) This means I could track the variable current and connect it to an actuator based on a temperature threshold. I could probably program it so the user can define the threshold.

Your Idea #5

- ☐ **Problem:** had a five acre property in Eagle Mountain with several fruit trees and a garden. Every season they had trouble keeping hungry wildlife off the land and away from the fruits and vegetables. The deer particularly were a nuisance. Chemical repellents are available in liquid form, but that would incur repetitive costs and additional labor.
- ☐ **Objective:** I propose a smart scarecrow device that would be engineered to defend crops from foraging wildlife.
- ☐ **Solution:** If a smart scarecrow could be developed such that it was both effective and affordable, it would be a great benefit to farming, especially for smaller, residential gardens and orchards.

Pitch Yourself Next Week

☐ We will have you come over to give elevator pitch

☐ Everyone has at most 3 minutes to talk about:

☐ Who are you?

☐ What do you do?

☐ What are your project ideas? (no need to be the final)

☐ What kind of people are you looking for?

☐ What are your skills?

☐ Why should other people team up with you?

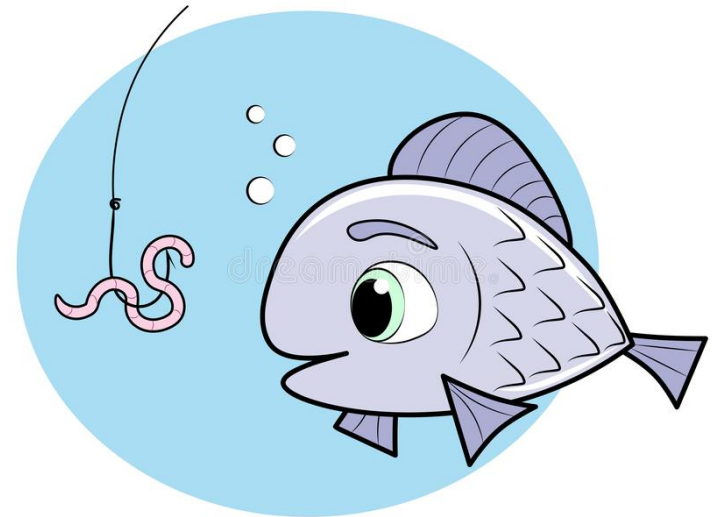
☐ Sign up:

<https://docs.google.com/spreadsheets/d/1JfWZkEyoXdVLtHkiwOqk24G7WVhLWMCP113cSe9fgsQ/edit?usp=sharing>

☐ Part of Assignment #2

Key Components of Elevator Pitch

- ❑ Simple, concise, specific, and no jargon
- ❑ Design your hook and make it attractive
 - ❑ A hook itself doesn't work
 - ❑ A hook should come with a worm
- ❑ Hook is what you offer and why you need it

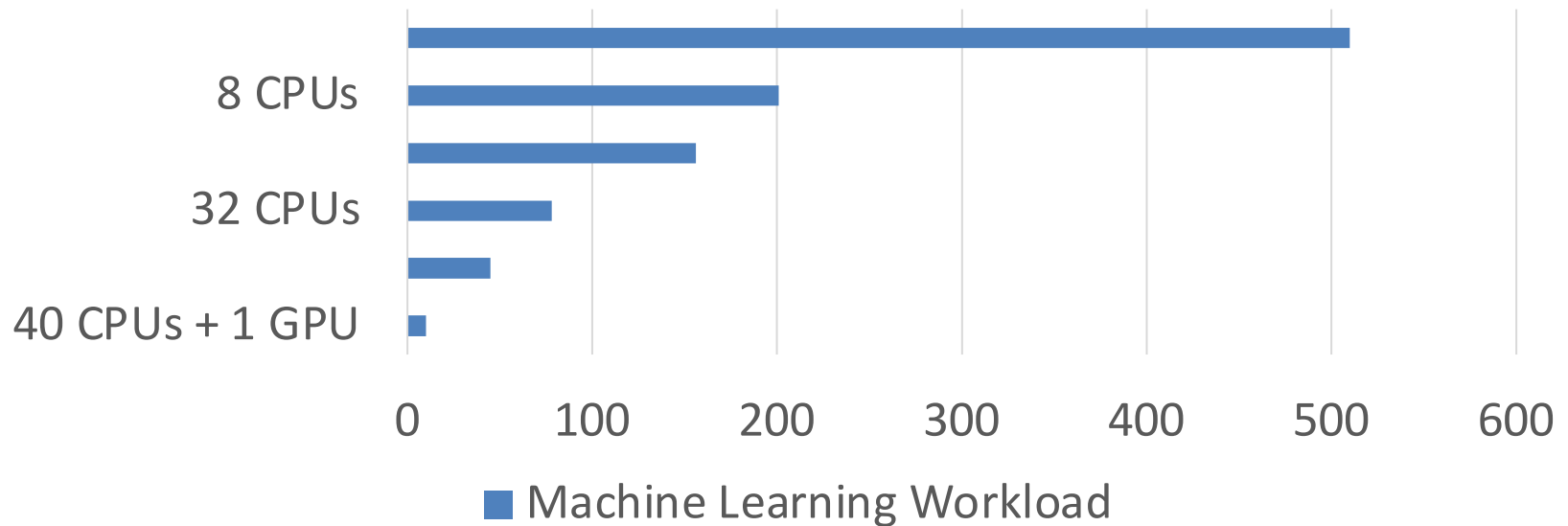


My Research Elevator Pitch

(Taskflow Project)

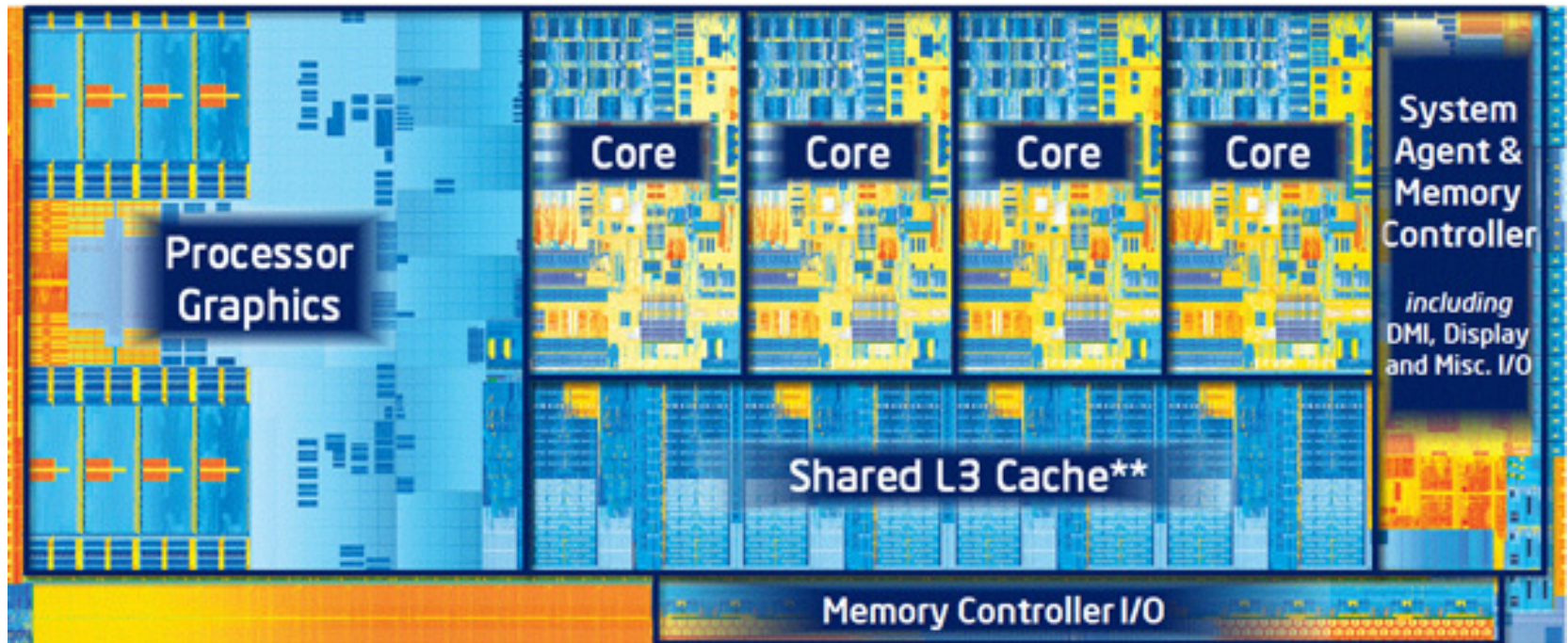
Why Do You Need Parallel Computing?

❑ Parallelism makes your applications run 100x faster



Your Computer is Already Parallel

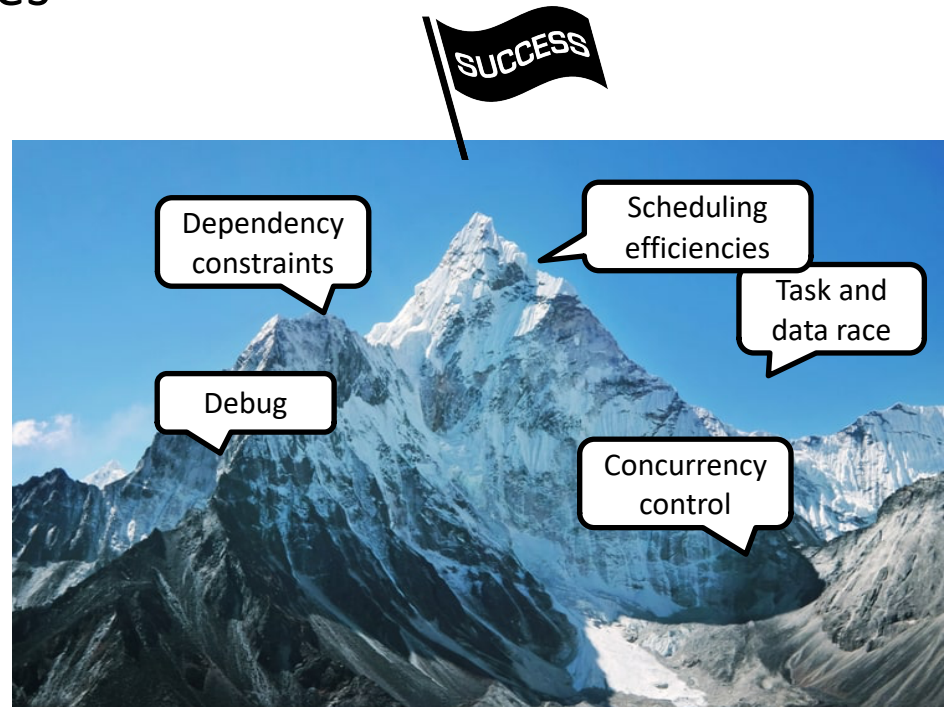
- ❑ Intel Core i7-377K (four cores to parallelize your jobs)



But, Parallel Programming is NOT Easy

- ❑ You need to deal with many difficult technical details
 - ❑ Concurrency control
 - ❑ Task dependencies
 - ❑ Scheduling efficiencies
 - ❑ Data race
 - ❑ Load balancing
 - ❑ ... (more)

Many developers have hard time in getting them right!



Taskflow Offers a Solution

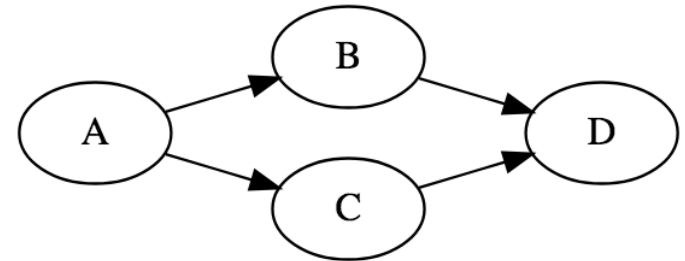
<https://taskflow.github.io/>



*How can we make it easier for you to quickly write
parallel and heterogeneous programs with **high**
performance and **simultaneous high productivity**?*

“Hello World” in Taskflow

```
#include <taskflow/taskflow.hpp>    // Taskflow is header-only
int main(){
    tf::Taskflow taskflow;
    tf::Executor executor;
    auto [A, B, C, D] = taskflow.emplace(
        [] () { std::cout << "TaskA\n"; },
        [] () { std::cout << "TaskB\n"; },
        [] () { std::cout << "TaskC\n"; },
        [] () { std::cout << "TaskD\n"; }
    );
    A.precede(B, C);
    D.succeed(B, C);
    executor.run(taskflow).wait();
    return 0;
}
```



// A runs before B and C
// D runs after B and C

Many Companies Are Using My Tools

- ☐ Machine learning
- ☐ Video processing
- ☐ Computer-aided design
- ☐ Data science
- ☐ Computer vision
- ☐ Scientific computing
- ☐ Game engine
- ☐ ...



That's it!

- ☐ **Step 1: control your nervousness**
- ☐ **Step 2: show your credentials**
- ☐ **Step 3: deliver your hook**

Assignment 2: Resume and Pitch

- ☐ This assignment lets others know about you
- ☐ Part 1: 1-page PDF
 - ☐ Resume + Link to your website
- ☐ Part 2: in-class pitch (next Wed)
 - ☐ <https://docs.google.com/spreadsheets/d/1JfWZkEyoXdVLtHkiwOqk24G7WVhLWMCP113cSe9fgsQ/edit?usp=sharing>
- ☐ Resume due 11:59 PM 2/5 via canvas