EC330 Discussion 1

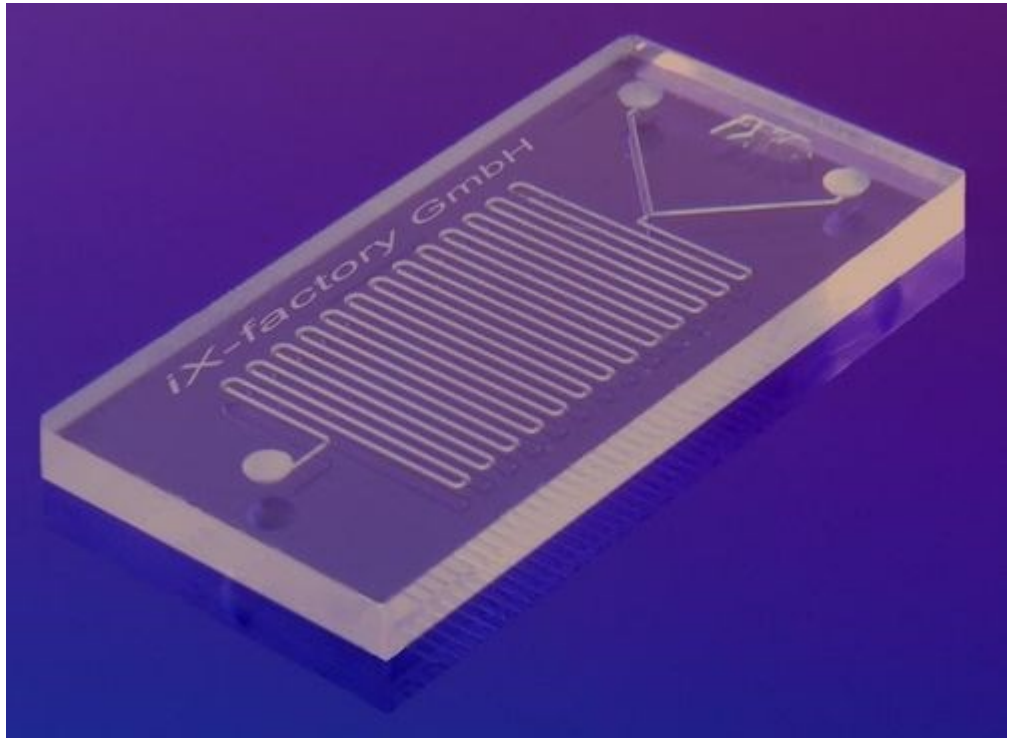
Shane McCormack

About Me

- First-year PhD student in computer engineering
- Graduated BU in CE+BME spring 2017
- Taken EC330 w/ Prof. Trachtenberg spring 2015
- Latest PhD addition to Prof. Densmore's CIDAR lab
- Research includes building a simplified language for specifying microfluidic devices for fabrication

My Research - Microfluidics

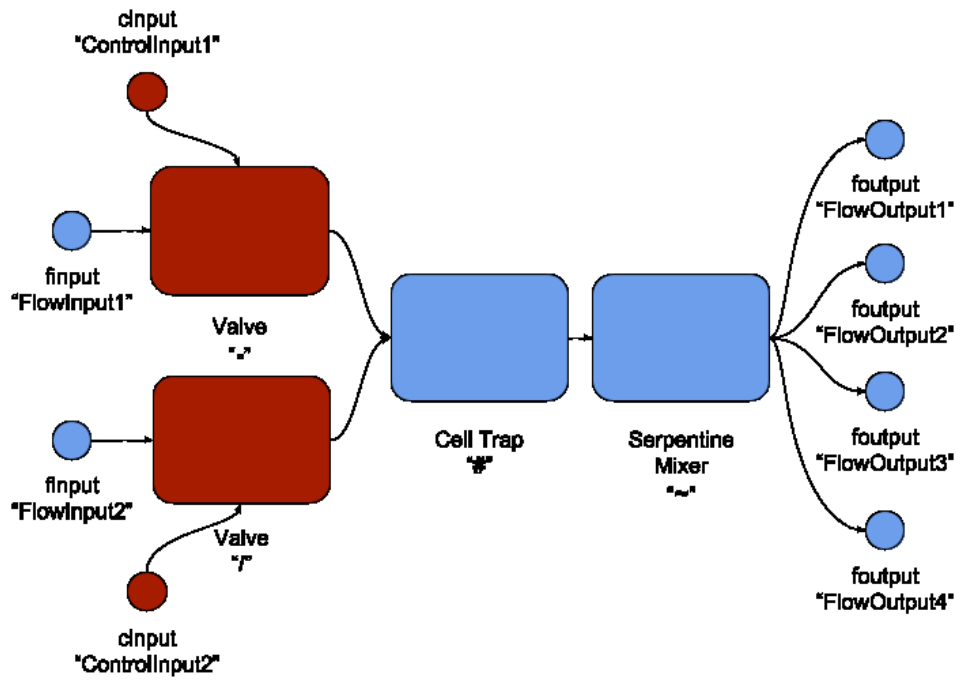
- Small (uL) devices
- Intake and outlet fluids
- Manipulate fluids via microfluidic components milled into chip
- Controllable via automated liquid pumps
- Parallelizable: can run many side-by-side
- End goal: replicate + automate biological experiments on-chip, obtain better data throughput via parallization



My Research – LFR

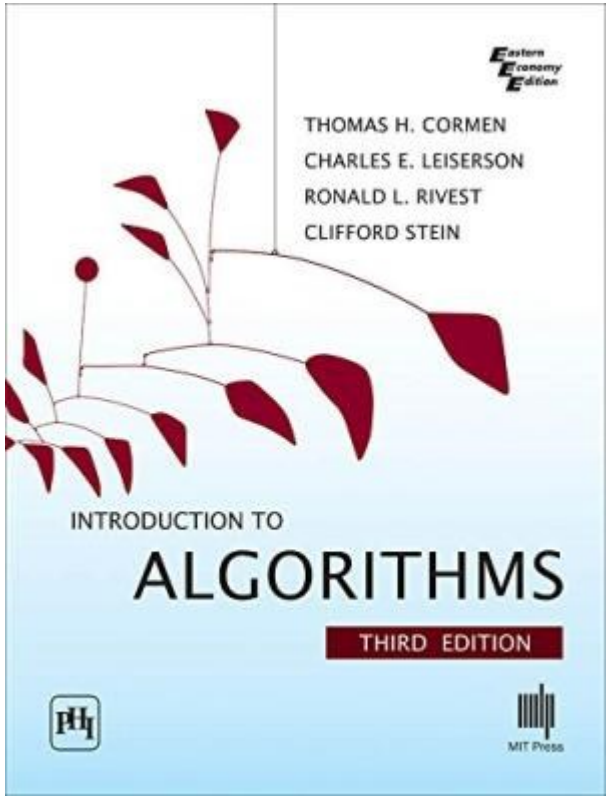
- Liquid Flow Relations
- User specifies inputs, outputs, and relations between these to define desired chip
- Relations are operators in Verilog-like assign statements
- Operators are defined in user-customizable library of parts
- LFR is translated to a more detailed, fabrication-ready language for chip production

```
module TwoInTwoValveYTrapSerpFourOut(finput flowInput1, flowInput2,
cinput controlInput1, controlInput2, foutput flowOutput1, flowOutput2,
flowOutput3, flowOutput4);
    fchannel flowChannel1, flowChannel2, flowChannel3;
    assign flowChannel1 = flowInput1-controlInput1;
    assign flowChannel2 = flowInput2/controlInput2;
    assign flowChannel3 = flowChannel2 # flowChannel1;
    assign flowOutput1 = flowChannel3~;
    assign flowOutput2 = flowChannel3~;
    assign flowOutput3 = flowChannel3~;
    assign flowOutput4 = flowChannel3~;
endmodule
```



Homeworks – Written

- A few problems/1.5 weeks
- Recommend referencing text if stumped
- Office Hours for TAs are M-F 6-8 PM in PHO 305
- My OHs are M 6-8 PM
- Submit in PDF format – only format Blackboard displays in-browser – helps graders a lot!



Homeworks – Programming

- Must compile on lab computers (PHO 305 & 307)!
  - Exams are held in lab, good to be familiar with the environment
- Can write/test code physically in lab, or via ssh'ing into eng-grid on BU WiFi or BU VPN
  - Windows 10:
    - Install bash: https://msdn.microsoft.com/en-us/commandline/wsl/install_guide
    - Alternative programs: Cygwin, MobaXTerm
  - Mac OS, Linux:
    - Use Terminal (included by default)

SSH’ing onto eng-grid

- `ssh KerberosUsername@eng-grid.bu.edu` to connect via bash
- Use `qlogin` after logging in with Kerberos credentials to be assigned to a dedicated computer
  - Forgetting to run qlogin leaves you at the eng-grid shared login entry point – slowing down everyone else!

Available IDEs

- The following IDEs can be used in lab via the following commands in terminal:
  - Eclipse
    - `source add_eclipse-oxygen.sh` to add
    - `eclipse-oxygen` to run
  - Netbeans
    - `source add_netbeans-8.2.sh` to add (full version)
    - `source add_netbeans-8.2-cpp.sh` to add (C++ only version)
    - `netbeans` to run (whichever was added)
  - Jetbrains CLion (requires Jetbrains .bu.edu email registration)
    - `clion` to run
- Being familiar with writing code in lab (text editors work too!) will save you time on exams

Compiling Code

- On lab computers & via eng-grid
- Use `module load gcc` to load up correct version of GCC compiler
- Use `g++ -o desired_program_name -std=c++11 file1.cpp file2.cpp file3.cpp …` to compile – this is how graders will compile your code

Important Points

- Contact: aonanam@bu.edu
- OHs: M-F 6-8 PHO 305, I will be there Mondays
- On exams:
  - Will be held in lab, on lab computers
  - cplusplus.org is available, Google/most sites will not be
  - Personal accounts will not be used, accounts will be created for the exam
  - Can bring text; hardcopy or on flashdrive