香港中文大學
The Chinese University of Hong Kong

CSCI2510 Computer Organization

Lecture 00: Course Information

Ming-Chang YANG

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Course Information

- CSCI2510 Computer Organization

- Course Time and Place
  - Lecture (*3)
    - MON 12:30~14:15 (@ ERB 404)
    - TUE 12:30~13:15 (@ ERB 404)
  - Tutorial (*1)
    - TUE 14:30~15:15 (@ LSB LT1)

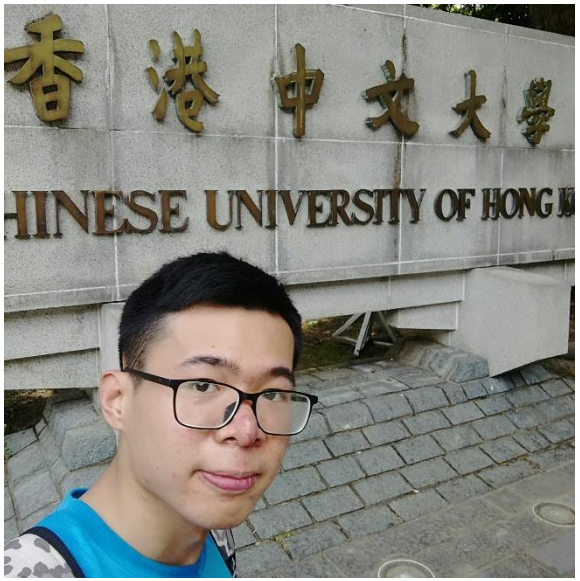
- Course Website
  - http://www.cse.cuhk.edu.hk/~mcyang/csci2510/2019F/csci2510.html

Course Instructor

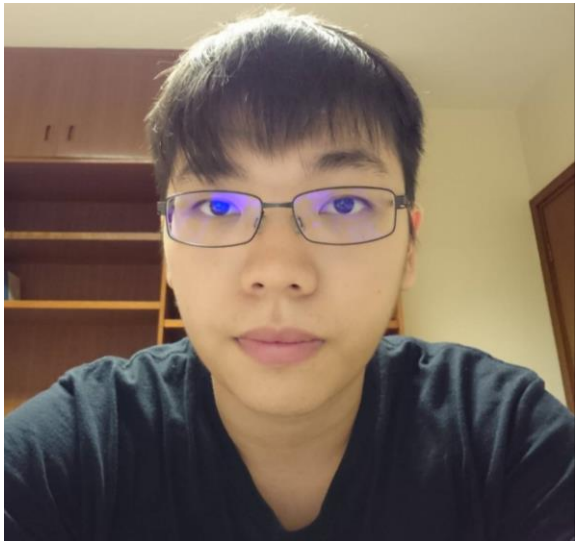
- Prof. Ming-Chang YANG (楊明昌)
  - Office: SHB 906 (3943-8405)
  - Office Hours: TUE 15:30~17:30
  - mcyang@cse.cuhk.edu.hk

Teaching Assistants

- Yuhong LIANG (梁裕宏)
  - Office: SHB 101
  - Office Hours: MON 15:30~17:30
  - yhliang@cse.cuhk.edu.hk



- Tsun-Yu YANG (楊尊宇)
  - Office: *TBD (under construction)*
  - Office Hours: THU 15:00~17:00
  - yangty@cse.cuhk.edu.h



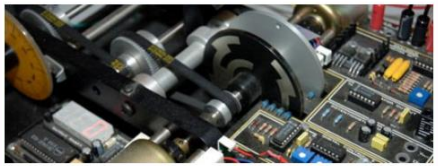
Before we start …

Faculty of Arts

Faculty of Business Administration

Faculty of Education

Faculty of Engineering



Faculty of Law

Faculty of Medicine

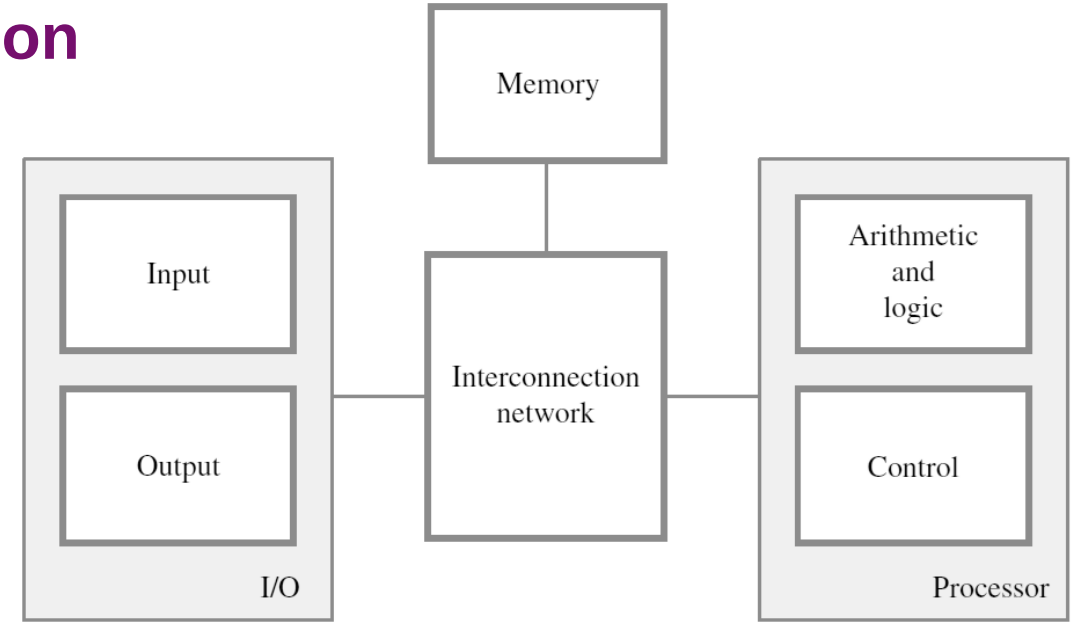
Faculty of Science

Faculty of Social Science

Graduate School

Course Description

- This course is designed to learn:
  - **Computer Organization**
    - Processor (CPU)
    - Memory unit
    - Input/Output units
    - Interconnection buses

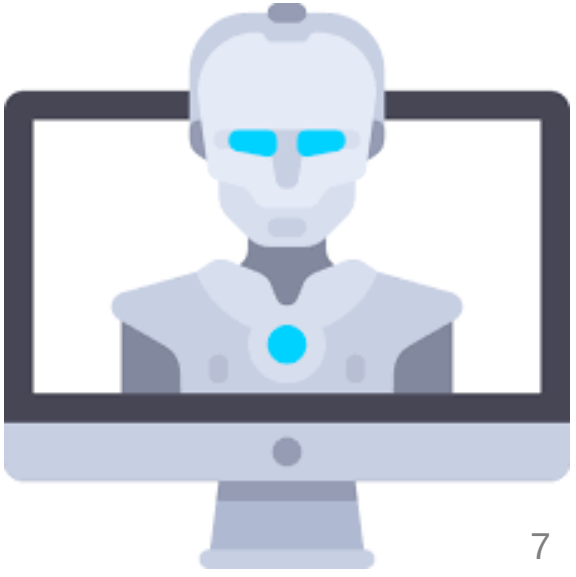


  - **Assembly Language Programming** *(as a tool to study)*
    - Internal coding of information
    - Number representation
    - Arithmetic operations
    - Flow of information within a microcomputer

```
mov ecx, ebx
mov esp, edx
mov edx, r9d
mov rax, rdx
```

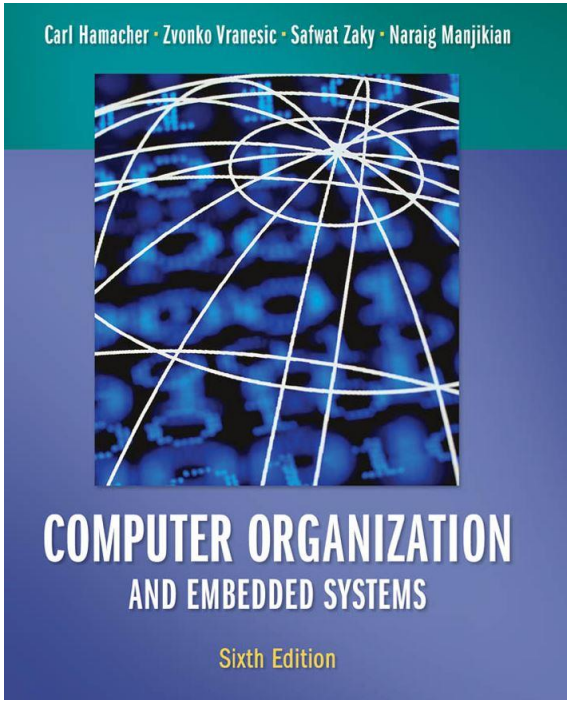
Why do we study this course?

- Why do we study computer organization and assembly languages?
  - To understand how a computer works internally using the assembly language.
  - To maximize the efficiency of computer software.
    - *Why* maximize efficiency?
      - To tackle programs and data of rapidly increasing sizes.
      - To save costs of developing a computer.
    - *How* to maximize efficiency?
      - By understanding the limits of hardware.
      - By writing good software/program.
  - To build and invent NEW! computers.



Textbook

- Textbook
  - Computer Organization and Embedded Systems, 6th Ed.
    - Hamacher, Vranesic, Zaky, and Manjikian
    - McGraw Hill, 2012



Acknowledgement: Thanks to Michael Fung, Philip Leong (CUHK), Y.S. Moon (CUHK), O. Mencer (Imperial), N. Dulay (Imperial) for all slides used in this course.

Course Assessment (Re-distributed)

- Grading
  - Assignment 1 20%
  - Assignment 2 30%
  - ~~Assignment 3 0%~~ *(cancelled!)*
  - Midterm Exam 50%
  - ~~Final Exam 0%~~ *(cancelled!)*
  - ~~Class Participation 0%~~
  - *Bonus 5%*

- Notes
  - Late submission per day is subject to 10% of penalty.
  - ~~A student must attend at least 80% of lectures in order to gain all class attendance credits.~~

Course Schedule

*Date in red: Public holiday or class suspension

W	Date	Lecture	Note
1	Sep 2, 3	Lec01 Basic Structure of Computers	
2	Sep 9, 10	Lec02 Number & Character Representation	Tut01
3	Sep 16, 17	Lec03 Memory Basics	Tut02
4	Sep 23, 24	Lec04 Machine Instructions	Tut03, HW1
5	Sep 30, Oct 1	Lec05 Program Execution	No Tutorial
6	Oct 7, 8	Lec05 Program Execution (Cont'd)	Tut04, HW1 DUE
7	Oct 14, 15	Lec06 Memory Hierarchy	Tut05, HW2
8	Oct 21, 22	Lec07 Cache in Action	Tut06 (Review)
9	Oct 28, 29	Lec08 Performance Considerations	**Mid (Lec01~05)**, Tut07
10	Nov 4, 5	Lec09 Virtual Memory	Tut08, HW2 DUE
11	Nov 11, 12	Lec10 Basic Processing Unit	Tut09, HW3
12	Nov 18, 19	Lec11 Control Unit & Instruction Encoding	Tut10
13	Nov 25, 26	Lec12 Pipelining	Tut11, HW3 & PG3 DUE
14	**Dec 5**	**Final Exam (Lec06~12)**	

Programming Tools

- Microsoft Macro Assembler v14 (under Microsoft Visual Studio 2015)
  - Community Edition:
    - Free for Genuine Windows users
    - Full-featured industrial-grade software
  - Usage Guideline:
    - Install Visual Studio Community 2015
      - https://www.visualstudio.com/
    - Create C/C++ Project and accept default MASM/ML build rule (details to be discussed in tutorials)

Important Notes

- Visit our course website regularly

- Plagiarism will **NOT** be tolerated
  - Don't copy!
  - Don't let other(s) copy!
  - Can discuss but write up the solutions by yourself!

- Honesty in Academic Work:
  - http://www.cuhk.edu.hk/policy/academichonesty/

The best way to learn is through practice!