CSU0007 Basic Electronics

Course Introduction, and The Circuit Abstraction

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NATIONAL TAIWAN NORMAL UNIVERSITY

Agenda

Links to the lecture recording will be posted on the Moodle.

1. Introduction
   - Essense
   - Grading policy
   - Academic integrity
2. The Circuit Abstraction
3. Recap

Course information

- Instructor: Chao Wang 王超
  - cw@ntnu.edu.tw
  - Office hours: Wednesdays and Thursdays, 2–4PM, or by appointment
- Teaching assistant: Shih-Jie Lin 林士傑
  - 40847014s@gapps.ntnu.edu.tw
- Course webpage: https://wangc86.github.io/csu0007/
  - An one-page summary of this course
- Course Moodle: https://moodle.ntnu.edu.tw/
  - Course slides, homework assignments, discussions, etc.

Course objective and organizaion

- Objective
  - For freshman students to learn the basics of electronic circuits, as a preparation for advanced topics in computer science and engineering discipline.
- Organization
  1. Lectures: blackboard illustration + slides (like this one)
  2. Reading assignments: textbook + lecture notes
  3. Homework assignments

This course is offered in English

- Offered in English $\neq$ An English course
- EMI: English as a Medium of Instruction
  - promote online/offline discussion and conversation
  - make a liberal use of time to expound key ideas
  - use homework assignments as a crucial part of the learning process

Textbook and other references

- Agarwal, Anant and Lang, Jeffrey H. Foundations of Analog and Digital Electronic Circuits. Morgan Kaufmann; 1 edition (July 18, 2005). ISBN 978 1558607354 [Required]
  - You may purchase a copy from Elsevier, books.google.com, etc.
  - We also have a hard copy at our library
- Go to the course webpage for both lecture notes and additional references.

Grading policy

- Homework assignments 45% (every assignment counts)
- Midterm exam 20%
- Final exam 25%
- Participation 5%
- Attendance 5%
- All homework assignments are to be submitted via Moodle.
  - Submitting with the 24 hours past the deadline your score for that assignment will be deducted by 40%; after 24 hours, score = zero.
- There will be no make-up exam.

Academic integrity

Figure: NTNU's motto.

- Sincerity
  - No hypocrisy. No cheating.
- Integrity
  - Walk in the light.
- Diligence
  - Preserverence and patience.
- Simplicity
  - Keep it simple but no simpler.

What is abstraction?

What is abstraction?

- Abstraction is a way to hide unnecessary details of our subject.
- Abstraction is a way to help us focus on the key properties.
- Where do you see the use of abstraction in our daily life? In artwork? In engineering?

Layers of abstraction in computer engineering

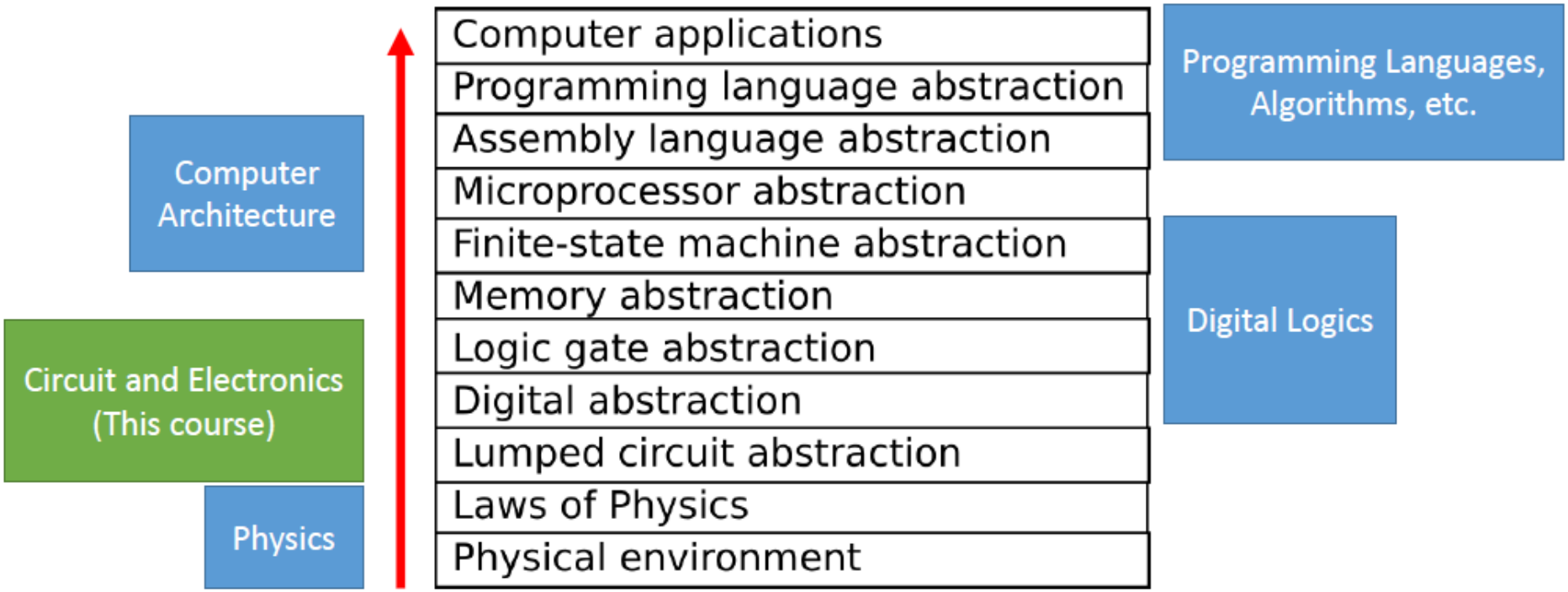

Figure: Layers of abstraction, and some related CS courses.

Constraints

- In engineering, often, an abstraction (a model) helps only under some assumptions (conditions, or *constraints*).
- Example: motion with uniform acceleration
  - you know physics: $v = v_0 + a \cdot t$
  - the falling of a metal ball vs. that of a collection of feathers
  - with gravity, the two objects will fall with the same speed only if ___
- A beautiful experiment to watch: https://youtu.be/E43-CfukEgs

Takeaway from these slides

- Remember to check out both the course webpage and Moodle.
  - Add to your Moodle account your email address to receive course notifications.
  - The complete lecture note is available!
- Start to read both Chapter 1 and Appendix A.1 of the textbook.
- The idea of abstraction and constraint, and their relation.
- *Now, we will turn to the whiteboard for the rest of today's lecture.*
  - ready to take note