# Computer Architecture

## Lecture 2b: Course Info & Logistics

Prof. Onur Mutlu
ETH Zürich

Fall 2021

1 October 2021

# Course Info: Who Are We?

- **Onur Mutlu**
  - Full Professor @ ETH Zurich ITET (INFK), since September 2015
  - Strecker Professor @ Carnegie Mellon University ECE/CS, 2009-2016, 2016-…
  - PhD from UT-Austin, worked at Google, VMware, Microsoft Research, Intel, AMD
  - https://people.inf.ethz.ch/omutlu/
  - omutlu@gmail.com (Best way to reach me)
  - https://people.inf.ethz.ch/omutlu/projects.htm
- Research and Teaching in:
  - Computer architecture, computer systems, hardware security, bioinformatics
  - Memory and storage systems
  - Hardware security, safety, predictability
  - Fault tolerance
  - Hardware/software cooperation
  - Architectures for bioinformatics, health, medicine
  - …

# Course Info: The Teaching Team

- Teaching Assistants
  - Dr. Mohammed Alser
  - João Dinis Ferreira
  - Rahul Bera
  - Geraldo F. de Oliveira Jr.
  - Can Firtina
  - **Dr. Juan Gomez Luna**
  - Hasan Hassan
  - Konstantinos Kanellopoulos
  - Nika Mansouri Ghiasi
  - Dr. Haiyu Mao
  - Dr. Lois Orosa
  - Dr. Jisung Park
  - Gagandeep Singh
  - Giray Yaglikci
  - Dr. Mohammad Sadrosadati
  - Dr. Behzad Salami
  - Dr. Nour Almadhoun Alserr
  - Rakesh Nadig
  - Haocong Luo
  - Roknoddin Azizi
- Get to know them and their research

# Some Goals of This Course

- Teach/enable/empower you to:
  - Understand how a computing platform works
  - Understand how decisions made in hardware affect the software/programmer as well as the hardware designer
  - Think critically (in solving problems)
  - Think broadly across the levels of transformation
  - Understand how to analyze and make tradeoffs in design
  - Apply the above in several lab projects and HWs

# Review: Major High-Level Goals of This Course

- Understand the principles (of design)
- Understand the precedents

- Based on such understanding:
  - Enable you to evaluate tradeoffs of different designs and ideas
  - Enable you to develop principled designs
  - Enable you to develop novel, out-of-the-box designs

- The focus is on:
  - Principles, precedents, and how to use them for new designs

- In Computer Architecture

# Why These Goals?

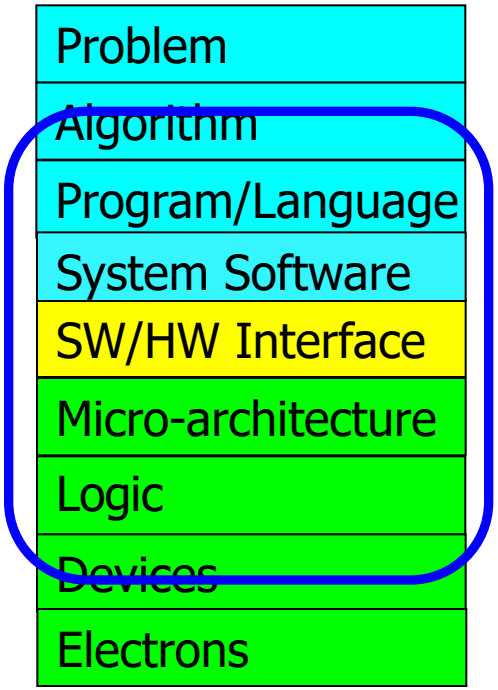
- Regardless of your future direction, learning the principles and methodical analysis techniques we cover will be useful to
  - design better hardware
  - design better software
  - design better systems
  - make better tradeoffs in design
  - understand why computers behave the way they do
  - solve problems better
  - think "in parallel"
  - think critically
  - …

# A Note on Hardware vs. Software

- This course might seem like it is only "Computer Hardware"
- However, you will be much more capable if you master both hardware and software (and the interface between them)
  - Can develop better software if you understand the hardware
  - Can design better hardware if you understand the software
  - Can design a better computing system if you understand both

# The Transformation Hierarchy

**Computer Architecture (expanded view)**



# What Do I Expect From You?

- Required background: Digital circuits course, programming, an open mind willing to take in many exciting concepts.

- Learn the material thoroughly
  - attend lectures, do the readings, do the exercises, do the labs
- Work hard: this will be a hard, but fun & informative course
- Ask questions, take notes, participate
- Perform the assigned readings
- **Participate online (lecture, Moodle)**
- Start early
- If you want feedback, come to office hours

- Remember "Chance favors the prepared mind." (Pasteur)

# What Do I Expect From You?

- How you prepare and manage your time is very important

- There will be many lab and homework assignments
  - They will take time
  - Start early, work hard

- This will be a heavy course
  - However, you will learn a lot of fascinating topics and understand how a computing platform works
  - And, it will hopefully change how you look at and think about designs around you

# How Will You Be Evaluated?

- Lab assignments: 50%
- Final exam (180 minutes): 30%
- Homeworks: 20%

- Many extra credit possibilities in HWs, Labs, Exam

# Course Goals

- Goal 1: To familiarize those interested in computer system design with both fundamental operation principles and design tradeoffs of processor, memory, and platform architectures in today's systems.
  - Strong emphasis on fundamentals, design tradeoffs, key current/future issues
  - Strong emphasis on looking backward, forward, up and down

- Goal 2: To provide the necessary background and experience to design, implement, and evaluate a modern processor by performing hands-on simulator implementation.
  - Strong emphasis on functionality, hands-on design & implementation, and efficiency.
  - Strong emphasis on making things work, realizing ideas

# Course Website

- https://safari.ethz.ch/architecture/fall2021/
- All slides, lecture videos, readings, assignments to be posted
- Plus, other useful information for the course
- Check frequently for announcements and due dates

# Homework 0

- Due Sep 30
  - https://safari.ethz.ch/architecture/fall2021/lib/exe/fetch.php?media=hw0.pdf
- Information about yourself
- All future grading is predicated on homework 0

# Heads Up

- HW1 will be out this week
  - Due in ~2 weeks
- Lab 1 will be out soon
  - Due in ~2 weeks
- Check the website and email frequently for assignments and announcements
  - https://safari.ethz.ch/architecture/fall2021/

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