



CENG4480

Lecture 01: Introduction

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香港中文大學

The Chinese University of Hong Kong

Overview

Important Notes

Grading System

Course Overview



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Important Notes

- ▶ Be **PUNCTUAL** to class
- ▶ Keep **QUIET** during class, unless
 - ▶ you are raising questions to teachers or tutors
 - ▶ during in-class activities
- ▶ **DON'T OVER-ENGAGE** in extra-curricular activities or part-time jobs



Academic Honesty

Zero Tolerance

- ▶ Plagiarism, cheating, misconduct in test/exam will be reported to the Faculty Disciplinary Committee for handling.

Penalty

- ▶ **Zero** marks for the concerned assignments/test/exam/whole course, reviewable demerits, non-reviewable demerits, suspension of study, dismissal from University.

University Guidelines to Academic Honesty

- ▶ <http://www.cuhk.edu.hk/policy/academichonesty/>



Student/Faculty Expectations

- ▶ Let's join hands to create a **positive**, **respectful**, and **engaged** academic environment inside and outside classroom.
- ▶ Full version of Student/Faculty Expectations on Teaching and Learning
- ▶ <http://www.erg.cuhk.edu.hk/upload/StaffStudentExpectations.pdf>



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Grading System

- ▶ Class Attendance (5 marks)
- ▶ Homeworks (15 marks)
- ▶ 9 Labs (20 marks)
- ▶ Midterm Exam (20 marks)
- ▶ Final Exam (40 marks)
- ▶ (Optional) Final Project (10 marks)

A student must gain at least 50 marks in order to pass the course.



Grading System – Tips

- ▶ Individual lab (academic honesty!)
- ▶ About Absence in mid-term
- ▶ Class attendance: in-class quiz
Ex: http://www.cse.cuhk.edu.hk/~byu/doc/quiz_example.pdf
- ▶ Lecture review
- ▶ Bonus question
- ▶ Please read your marks from Blackboard (<https://blackboard.cuhk.edu.hk>)



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Overview – Part A



How to build up a Robot?



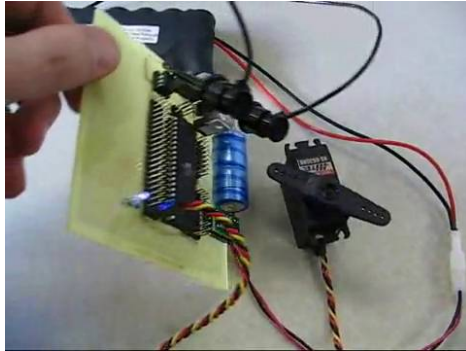
Overview – Part A

A1 Sensors

- ▶ Use of different sensors and their characteristics

A2 Op Amps and Analog Interfacing

- ▶ How to connect sensors to systems



Sensor demo (<http://www.youtube.com/watch?v=9NEiBDBXFEQ>)



Overview – Part A

A3 Analog-to-digital conversions ADDA

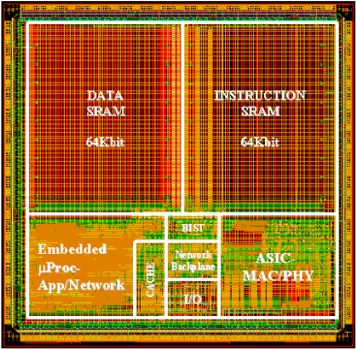
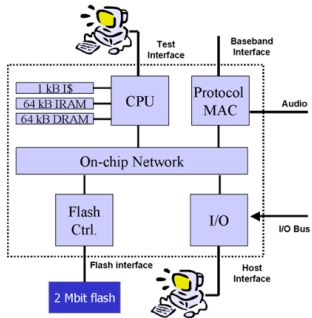
- ▶ Internal operations of different ADDA devices

A4 PID controller

- ▶ feedback control of motors



Overview – Part B



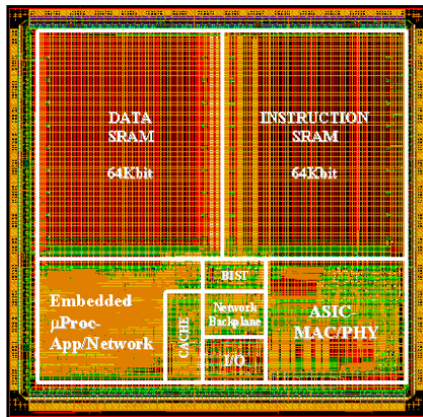
How to design an IP Core?

Overview – Part B

B1 Memory

B2 Clock

B3 Design Style (Optional)



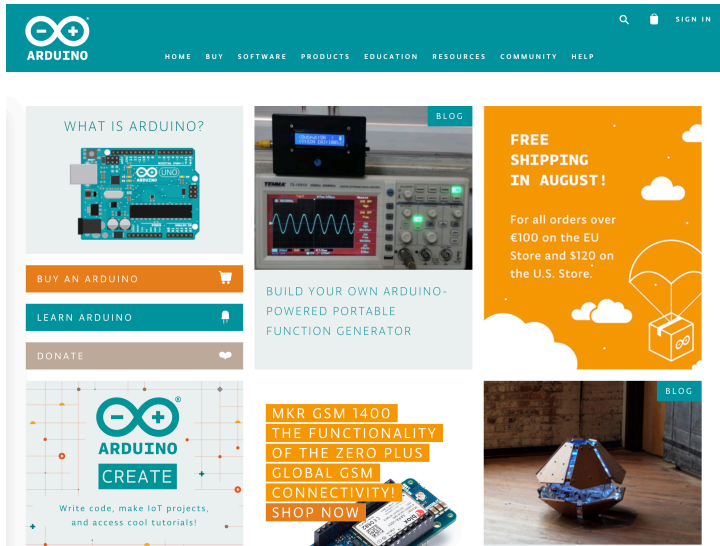
Overview – Project Demos

- ▶ **Demo 1: Self-Balancing Robot**
<https://youtu.be/dQWATsLa30g>
- ▶ **Demo 2: Robot Car w. Color Sensor**
<https://youtu.be/PKCPdWjzCqY>
- ▶ **Demo 3: Robot Hand**
<https://youtu.be/ai94rHHuaXc>
- ▶ **Demo 4: Robot**
<https://youtu.be/1D0e7SS85Xc>



Arduino

- ▶ <https://www.arduino.cc/>
- ▶ <https://youtu.be/nL34zDTPkcs>



The screenshot shows the Arduino website homepage with a teal header. The header contains the Arduino logo, a search icon, a shopping cart icon, and a 'SIGN IN' link. Below the header is a navigation menu with links for HOME, BUY, SOFTWARE, PRODUCTS, EDUCATION, RESOURCES, COMMUNITY, and HELP. The main content area is divided into several sections:

- WHAT IS ARDUINO?**: A section featuring an image of an Arduino Uno board. Below the image are three buttons: 'BUY AN ARDUINO' (orange), 'LEARN ARDUINO' (teal), and 'DONATE' (grey).
- BLOG**: A section with a teal 'BLOG' label. It features an image of an oscilloscope displaying a sine wave. Below the image is the text: 'BUILD YOUR OWN ARDUINO-POWERED PORTABLE FUNCTION GENERATOR'.
- FREE SHIPPING IN AUGUST!**: A large orange section with white text: 'For all orders over €100 on the EU Store and \$120 on the U.S. Store.' It includes an illustration of a cardboard box with the Arduino logo being lifted by a parachute.
- MKR GSM 1400**: A section with a teal 'BLOG' label. It features an image of an MKR GSM 1400 board. The text reads: 'MKR GSM 1400 THE FUNCTIONALITY OF THE ZERO PLUS GLOBAL GSM CONNECTIVITY! SHOP NOW'.
- ARDUINO CREATE**: A section with a grid background and the text: 'Write code, make IoT projects, and access cool tutorials!'.

