

Syllabus

Responsible lecturer
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Teaching assistant
Not decided

Graduate 1st year, Fall semester, 2016
Creative Design Engineering
Graduate School of Creative Design Engineering
UNIST
Ulsan, South Korea

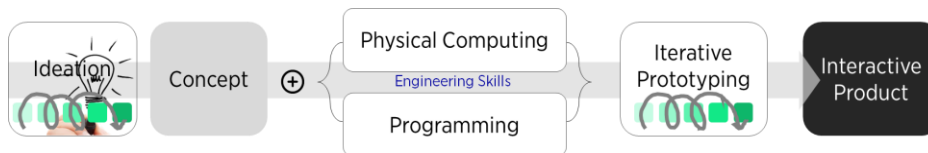
1. Course contents and the relevance to ID education Structure

The students in this class will learn ways to design and implement a highly-finished interactive prototype, specifically they will learn physical computing and programming skills for the implementation of their interactive product ideas. Students will learn systematic ways to generate novel and creative interactive product ideas by planning the concrete technologies to be used in their products and the hardware designs for implementation; and they will go through the iterative prototyping process of the concepts they have generated in order to complete their interactive prototypes that can be used in the real world. During the learning process, students will discuss ways to plan concrete technologies to be used in their products and the hardware designs for implementation based on their design concepts. They will have periodic discussions with the instructor about ways to improve their design concepts and to apply technologies from the perspective of design and interaction design research.

2. Study goals

The major goals of this course are:

- Focus on designing one highly-finished interactive prototype per a team or individually
- Learn ways to integrate and finalize their design concepts with technology
- Practice and learn HW and SW prototyping skills to implement their ideas
- Acquire systematic ways to generate novel and creative interactive product ideas
- Investigate and study previous cases in interaction design field



3. Education method

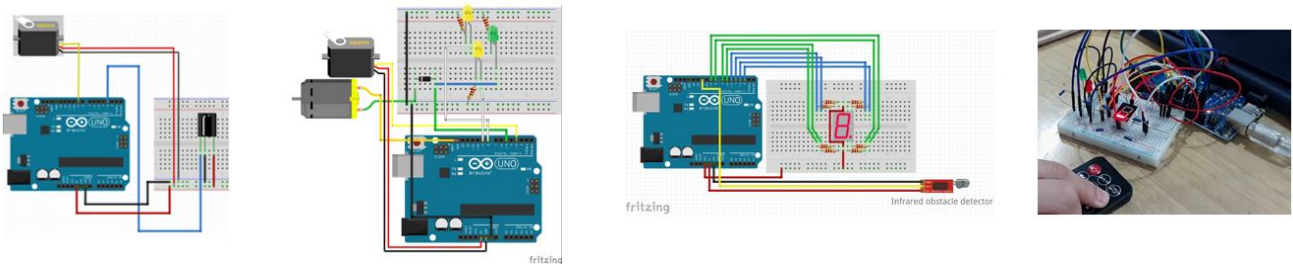
Week 1 ~ 8: Lecture and Practice (Learning and practicing technical knowledge and skills)

Week 9 ~16: Practice, Tutorial and Critics (Iterative Prototyping)

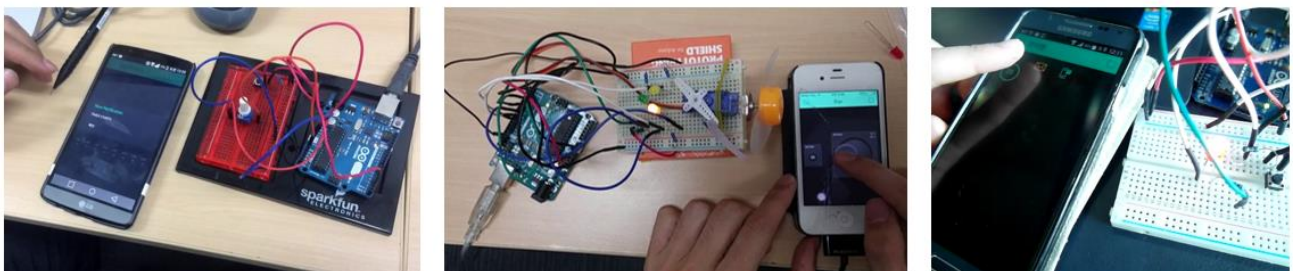
4. Deliverables

A. Programming & Physical Computing Exercises

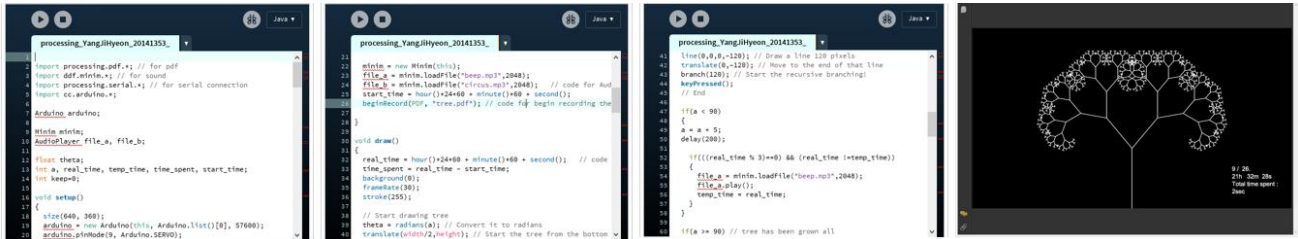
- Input & Output



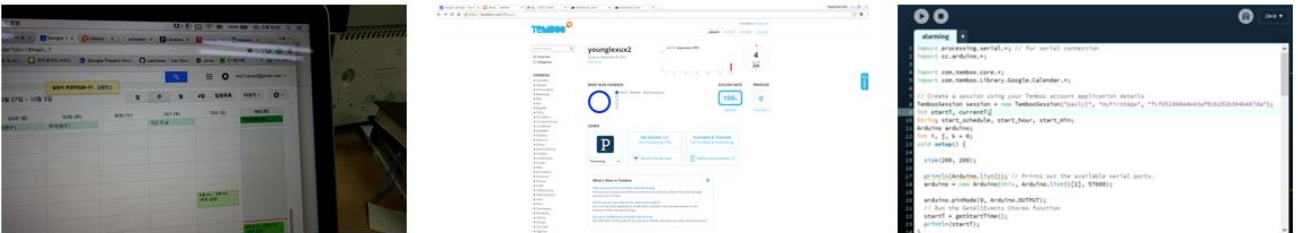
- Phone & Arduino



Advanced Programming Exercise



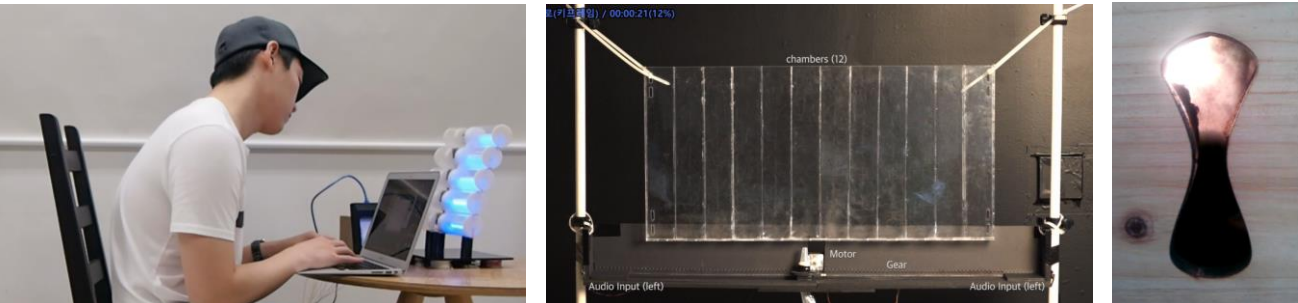
Temboo & Processing (SNS Data Communication)



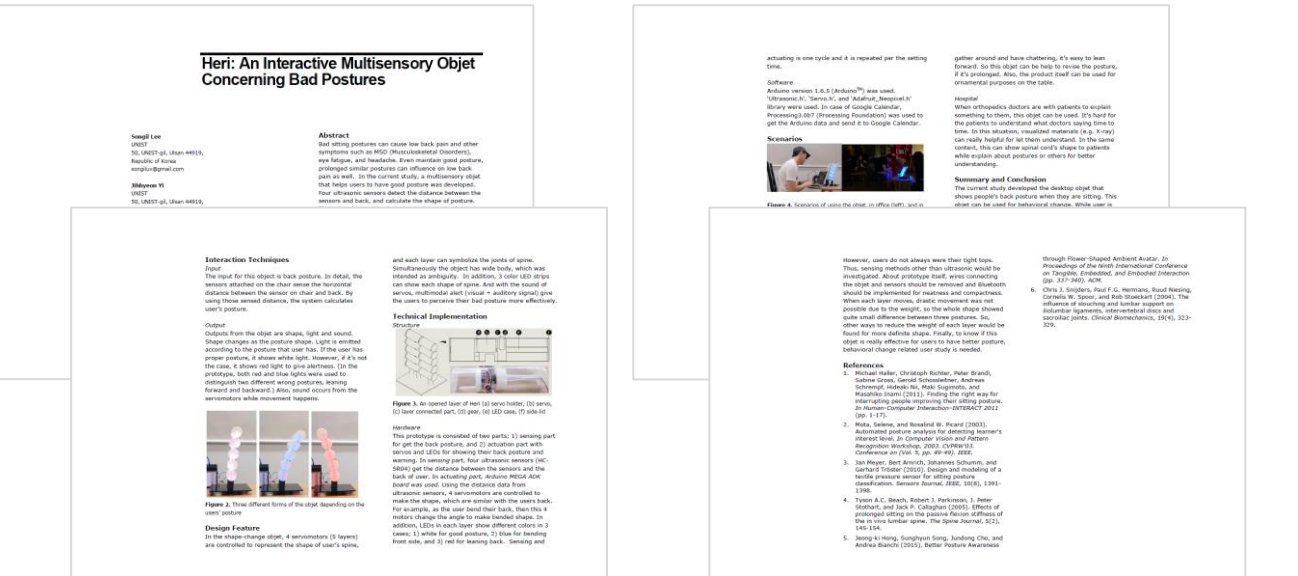
Midterm and Final Presentations



Video (Concept & Working Prototype)



Document



5. Assessment

Attendance and Participation: 20%

Assignments: 20%

Midterm Outcome: 20% (Concept: 10%, Prototype: 10%)

1. Concept Presentation (15 min): 10%
 - Novelty of Concept: 30
 - Interactivity: 30 (Creativity and Value of Input & Output)
 - Aesthetic Representation (Detail Plan): 30 (Shape and Material)
 - Use Scenario: 10
2. Prototype (10 min): 10%
 - Electronics: 30
 - Programming: 30
 - Representation Level of Proposed Concept: 40

Final Project: 40% (Concept: 10%, Prototype: 20%, Video: 5%, Document: 5%)

1. Working Prototype: 50% (Interactivity, Hardware, Software, Appearance (Shape, Material))
2. Concept: 20% (Novelty, Scenario)
3. Demo Video: 20% (Less than 2 mins)
(One Key Interaction → Iterative Prototyping Process → Overall Interactions with Scenarios)
4. Document: 10% (4 pages with CHI Work-In-Progress Format)

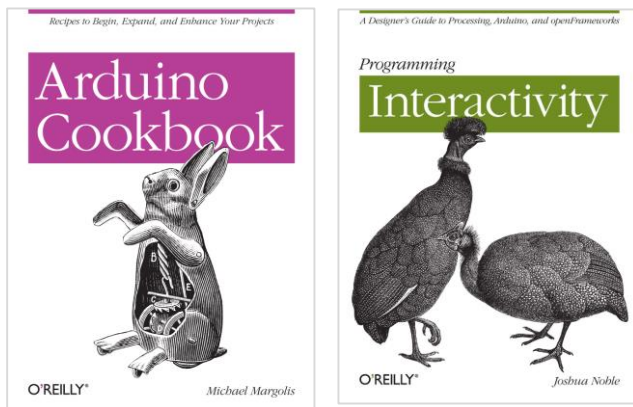
6. Schedule and organisation

Week	Date	Teaching contents/teaching method	Homework / Project
1	1 st class	Course Introduction and Trends in Interaction Design / Lecture	
	2 nd class	Electronics Basics Warm-up (Step by Step Arduino Exercise) / Lecture + Practice	Completion of Class Exercise
2	1 st class	Communication between Arduino and Processing (I/O) / Lecture + Practice	Simple Sensor to Actuator Exercise
	2 nd class	Smart Electrical Materials & Concept Card Introduction / Lecture + Practice	Concept Generation & Technology Search
3	1 st class	Concept Presentations and Discussions for Improvement / Lecture + Practice	Concept Revision and Brainstorming
	2 nd class	Controlling Arduino through Mobile Phones / Lecture + Practice	Simple Actuator Control through Mobile Phones
4	1 st class	Advanced Arduino+Processing 1 / Lecture + Practice	
	2 nd class	Advanced Arduino+Processing 2 / Lecture + Practice	Completion of Class Exercise
5	1 st class	Novel Sensors and Actuators Exercises (Arduino+Processing 3) / Lecture + Practice	
	2 nd class	Related Work Reviews of using I/O in Interactive Product Design / Lecture	
6	1 st class	Introduction to Fritzing (Designing PCBs) / Lecture + Practice	Fritzing Exercise
	2 nd class	Trends and Ways of Interactive Prototype Fabrication / Lecture + Practice	Prototype Fabrication Planning and Exercise
7	1 st class	Concept Development Tutorial 1	Concept Finalization and Technical Implementation
	2 nd class	Concept Development Tutorial 2	
8	1 st class	Midterm Outcome Presentation (Concept and Prototype)	Presentation & Demo
	2 nd class		
9	1 st class	Review of Lessons Learned / Lecture	
	2 nd class	Wireless Communication / Lecture + Practice	Concept Revision & Prototyping Planning
10	1 st class	Hardware Integration (Appearance, Electronics) / Practice	Integration Planning
	2 nd class	Hardware Design and Prototyping / Practice + Tutorial	Breadboard Wiring Completion

11	1 st class	Appearance Design 1 / Practice	
	2 nd class	Appearance Design 2 / Practice + Tutorial	Work-in-progress presentation & Critics
12	1 st class	PCB Design / Practice	PCB design using Fritzing
	2 nd class	PCB Review and Revision / Tutorial	Prototyping Planning & Concept Refinement & Critics
13	1 st class	SW Programming through Final Breadboard Wiring / Practice	Completion of Hardware Integration & Critics
	2 nd class	PCB handout and Hardware Integration / Practice + Tutorial	
14	1 st class	Test and Prototype Development Iteration 1 / Practice + Tutorial	Work-in-progress presentation & Critics
	2 nd class		
15	1 st class	Prototype Development Iteration 2 / Practice + Tutorial	Work-in-progress presentation & Critics
	2 nd class		
16	1 st class	Final Working Prototype Demo Presentation	Final presentation & Demo (Open)
	2 nd class		

7. Literature and study materials

Major References



- Margolis, M. (2011). Arduino cookbook. O'Reilly Media, Inc.
- Noble, J. (2009). Programming Interactivity: A Designer's Guide to Processing, Arduino, and Openframeworks. O'Reilly Media, Inc.

Other References

- McRoberts, M. (2010). Beginning Arduino. New York. Apress.
- Igoe, T. (2011). Making Things Talk: Using Sensors, Networks, and Arduino to see, hear, and feel your world. O'Reilly Media, Inc.
- O'Sullivan, D., & Igoe, T. (2004). Physical computing: sensing and controlling the physical world with computers. Course Technology Press.
- Greenberg, I. (2007). Processing: creative coding and computational art. Apress.

Major Tools

