week
01

Theory and Practice of Tangible User Interfaces

Introduction

Welcome!

- Introduction

- Tuesday and Thursday curriculum

- Course requirements

- Course survey

Instructors

Kimiko Ryokai

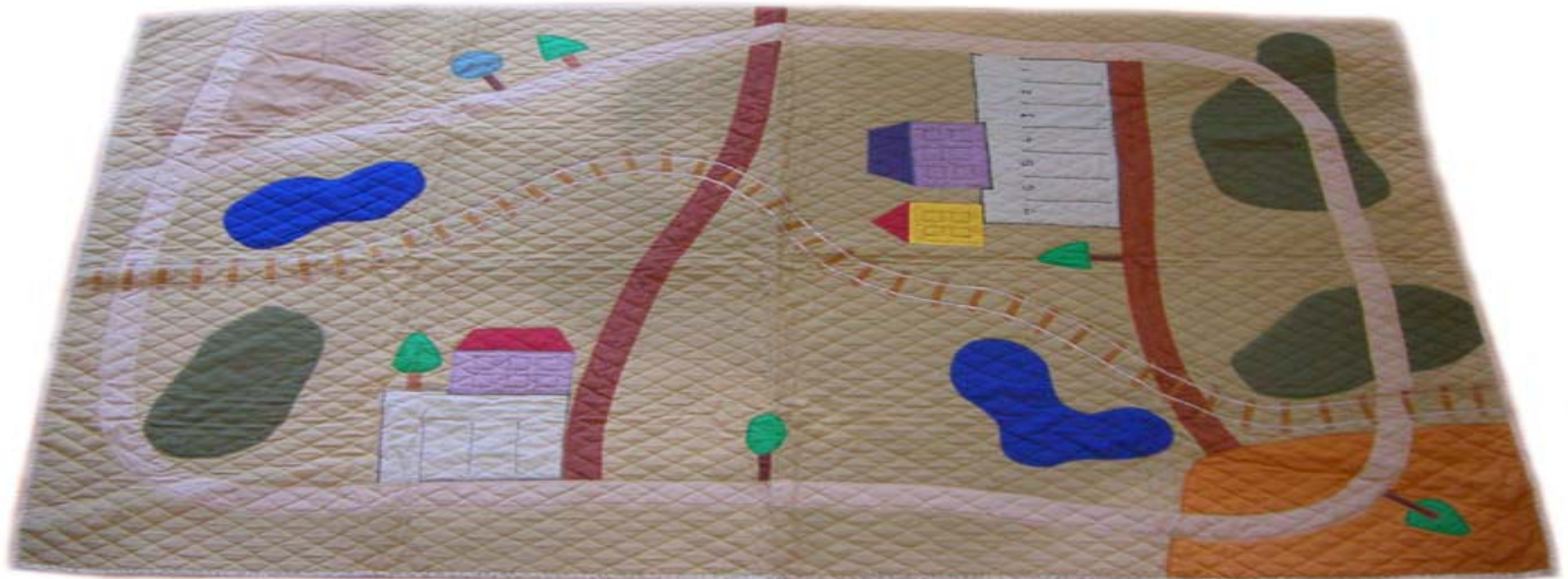Ryan Aipperspach

David Nguyen
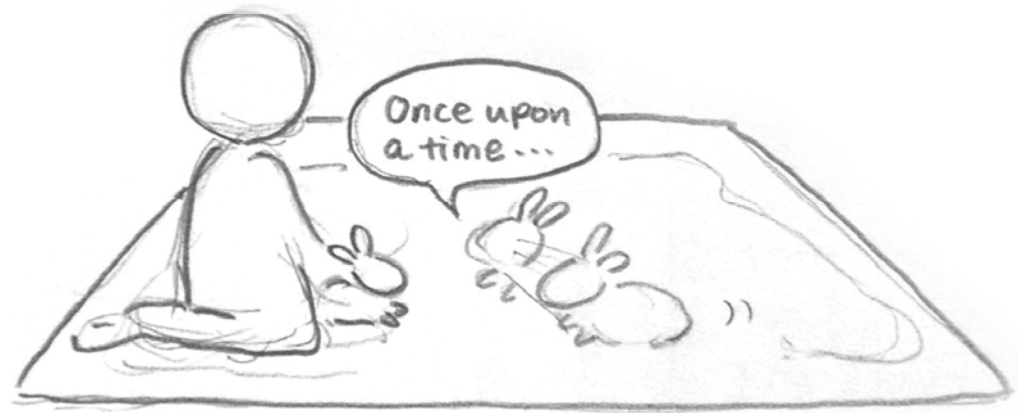
Kimiko

Instructors

Kimiko Ryokai

Ryan Aipperspach

David Nguyen

My Childhood Object

If my mat could tell a story…

StoryMat (1999)

What are Tangible User Interfaces?

- Theory?

- Taxonomy?

- Design principles?

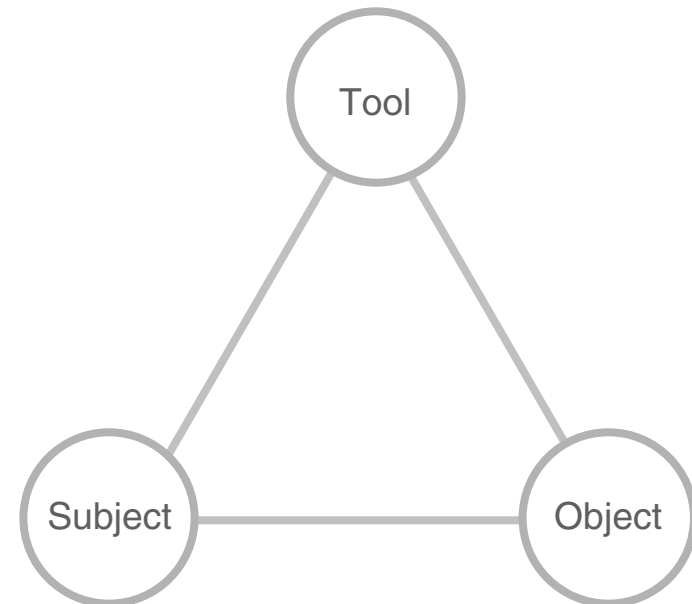- Enabling technologies?

- Evaluation?

		Tuesday LECTURE			Thursday LAB
Week 1	08/28	Introduction		08/30	Introduction to Physical Computing
Week 2	09/04	Activity Theory and HCI		09/06	Hello World with Arduino Boards
Week 3	09/11	Tangible Bits		09/13	Sensor 1: Potentiometers
Week 4	09/18	Containers, Tools, and Token: Taxonomy of TUIs		09/20	Sensor 2: Force sensors and photocells
Week 5	09/25	Calm Computing and Ambient Media		09/27	Output 1: Piezo speakers
Week 6	10/02	Human Centered Design		10/04	Output 2: Servo motors
Week 7	10/09	Design and Innovation		10/11	Output 3: DC motors
Week 8	10/16	Midterm Project Review		10/18	Output 4: Simple Mechanics
Week 9	10/23	Mixed / Augmented Reality		10/25	Synthesis 1: Invent a music instrument (group work)
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Week 15	12/04	Summary		12/06	Final Project Exhibition

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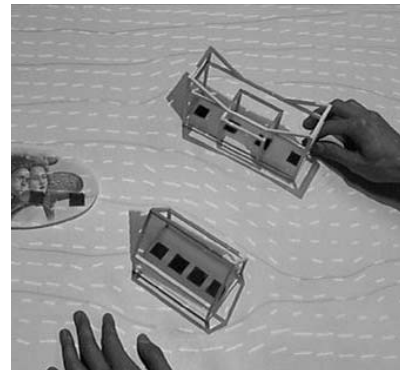| 08/28	Introduction
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Tool

Subject

Object

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Empathy Tool from
IDEO Method Cards

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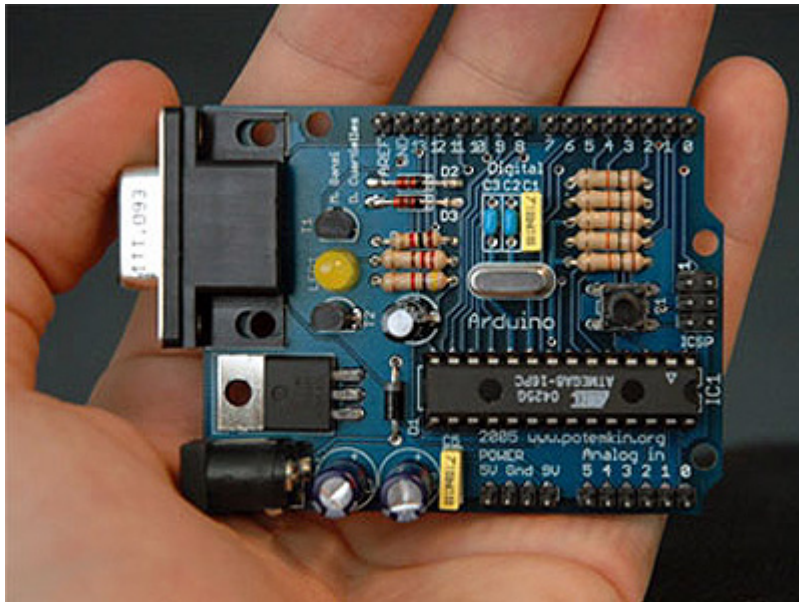|	
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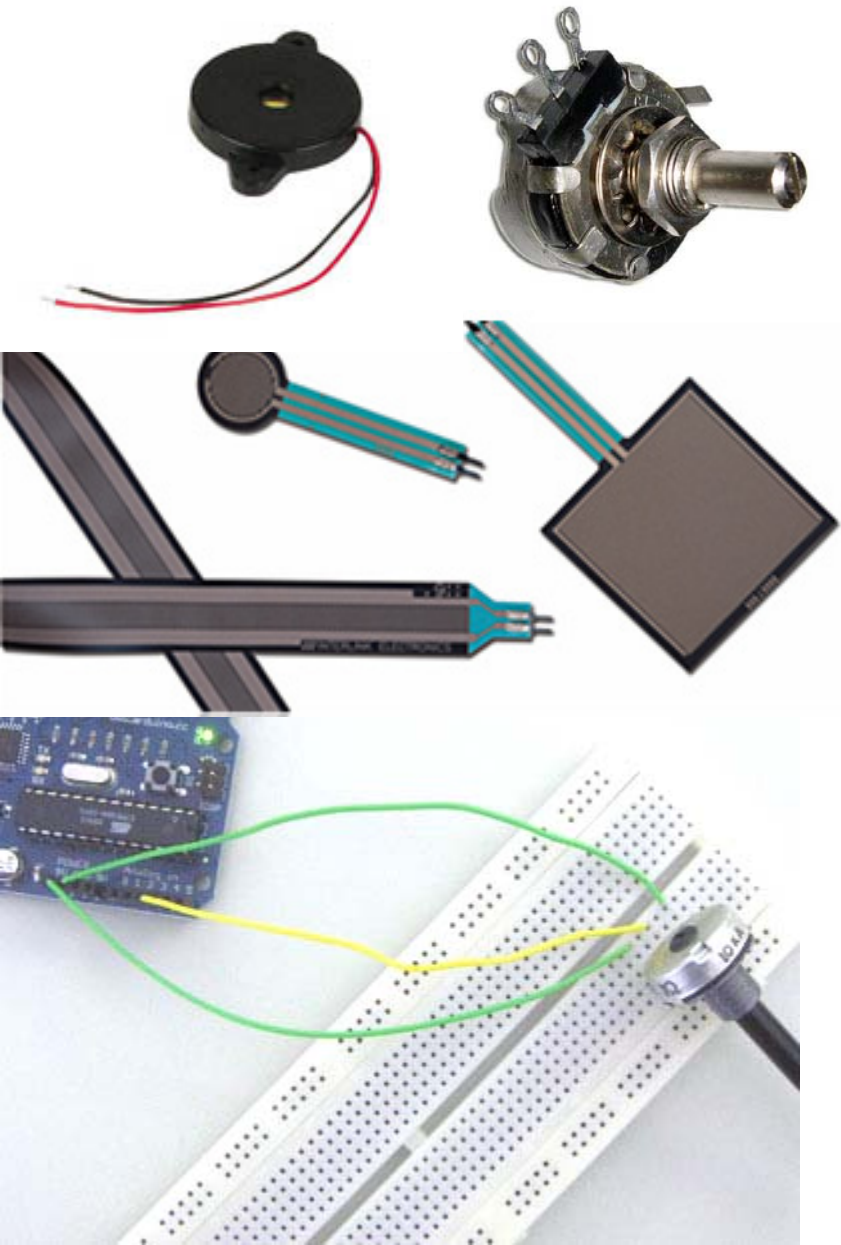|	
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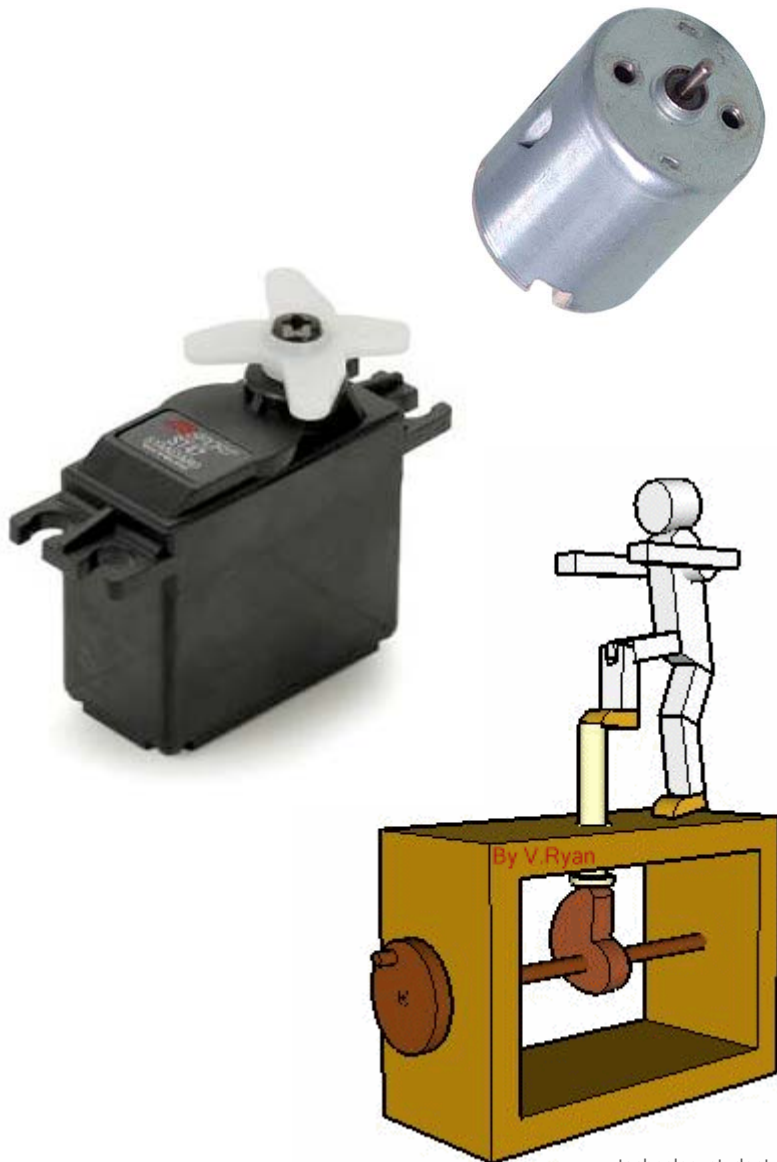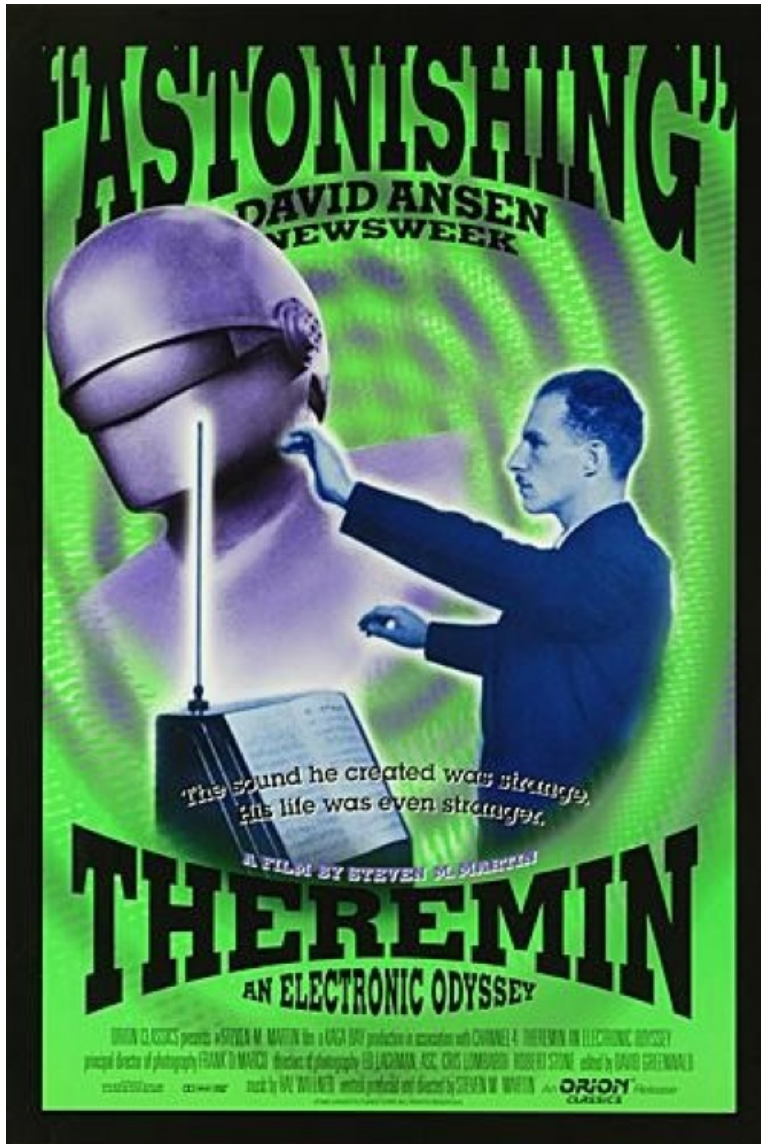|	
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Course Kit

Arduino NG, SparkFun #Arduino-USB	$31.95
Solderless breadboard, Digikey #23273-ND	$ 7.37
USB cable (3ft), Jameco #222607	$ 1.39
Blue LED, Jameco #183222	$ 2.95
Green LED, Jameco #334473	$ 1.45
Red LED, Jameco #33481	$ 0.27
Piezo buzzer, Jameco #336314	$ 1.26
5.1V zener diode, Jameco #179047	$ 0.04
220 ohm, 1/8W resistors (bag of 100), Jameco #107941	$ 0.69
10k ohm, 1/8W resistors (bag of 100), Jameco #108126	$ 0.69
1M ohm, 1/8W resistors (bag of 100), Jameco #108265	$ 0.69
1K ohm, 1/4W resistors (bag of 100), Jameco #690865	$ 0.69
10k ohm potentiometers, Jameco #255662	$ 0.95
Photocells - 100 grab bag, Jameco #169578	$12.95
TIP120 Jameco#:32993	$0.45
1N4004 diode Jameco#:35991	$0.05
AA Batteries	$1.00
2-AA battery holder Digikey #BC22AAW-ND	$0.51
DC motor, 16K RPM@3V Jameco#:154923	$1.01
RC Servo - standard, HobbyPeople #759310	$ 9.99
22 gauge solid hookup wire in red, black, and yellow	$ 5.00
Force sensors	$ 10.00

TOTAL $75.00 ~

Lab Textbook
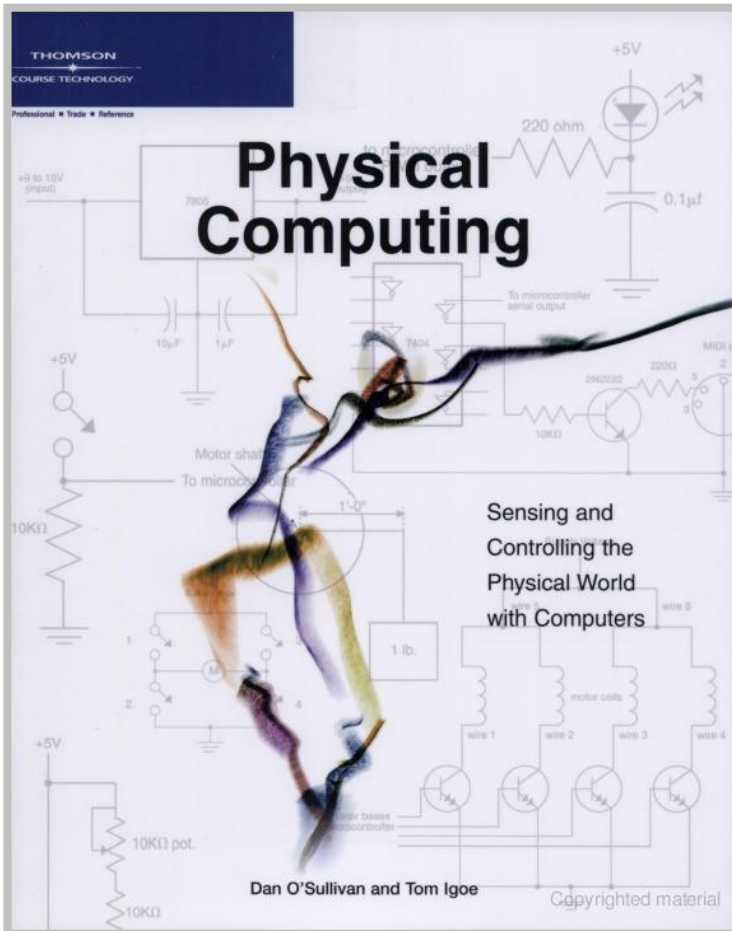
Physical Computing by O'Sullivan and Igoe

Theories and Approaches

Enabling Technologies

Your original IDEA!

Theories and Approaches

Enabling Technologies

Course Requirements

- Midterm Project (10%)

- Final Project (30%)

- Lab (25%)

- Homework (25%)

- Participation (10%)

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Midterm Project

Design a Tangible User Interface that takes advantage of your hands to manipulate digital information. Apply it to a topic of your research interest (e.g., tool for communication, learning/education, design, etc.). Your project may be based on a completely new design or redesign of familiar everyday objects.

- 9/25 Form a group (maximum of 3 members) for your project and write a 1-page proposal and post it on the course website
- 10/9 Progress sketches due (post your sketches on the course website)
- 10/23 In-class midterm project presentation. Present your poster and optional mockups

Final Project

You may expand your midterm project, or take a new approach. You may continue to work as a group (maximum of 3 members) or as an individual. If you work in a group, be clear about each member's role in the project.

- An interactive prototype to be exhibited at the final course exhibition on Dec 6, 2007. Your prototype is to demonstrate your original idea for a Tangible User Interface that takes advantage of your hands to manipulate digital information, and
- A write-up due Dec 13, 2007 in the ACM SIGCHI Extended Abstract format (6-8pgs)

Grading

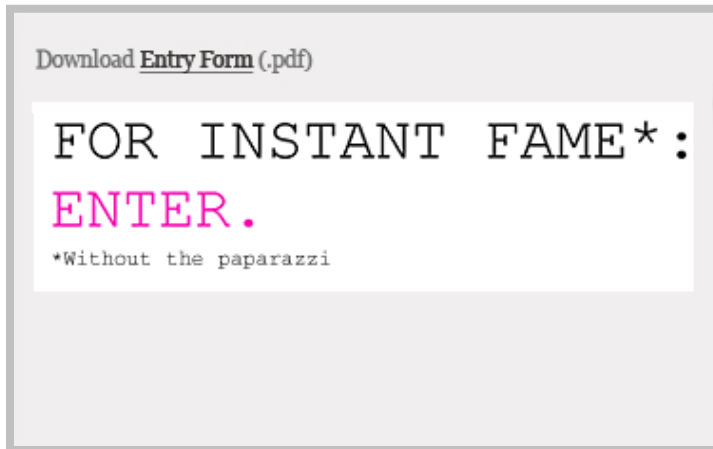Based on both the **quality** and **originality** of your work

Beyond the Course: Possible Venue 1
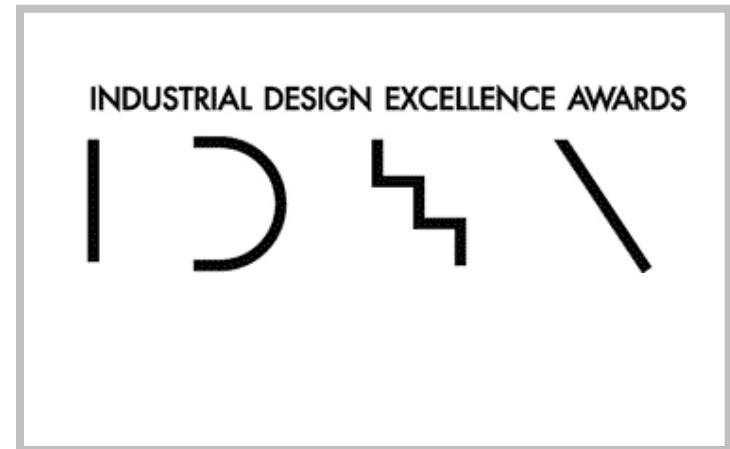
Conference paper submissions

- **CHI** (Alt CHI, deadline Jan 8, 2008, and full paper for 2009)
- **UIST** (around March 2008)
- **Ubicomp** (around March 2008)

Beyond the Course: Possible Venue 2

Student design competitions

ID Magazine Student Competition
Deadline February 1, 2008

Industrial Design Excellence Awards
Deadline early spring 2008

For Thursday, August 30

- Get the Physical Computing book

- Read the Intro, Chapters 1, 2, & 3 of Physical Computing book

- On Thursday, bring $75 for the lab kit (cash or check)

Q&A