Arduino Hands-on and Design Resources/Tools for Designers
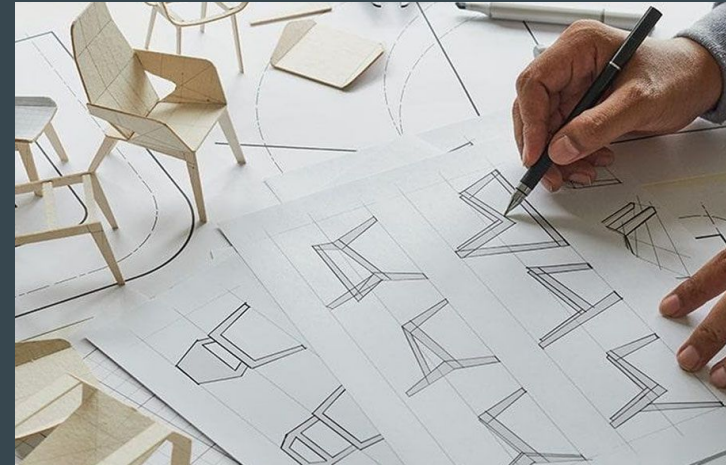
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Joe Kroeger - Client Interaction, Kyle Todd - Team Organization, Zhengyi Shen - Project Management, Tsung Hsuan Ho - Testing

Industrial Design Department

Mani Mina

Introduction

- Not a project that has been done before
- Met with our advisor several times to clarify our understanding of our project
- Explored the Industrial Design department meeting with students and faculty
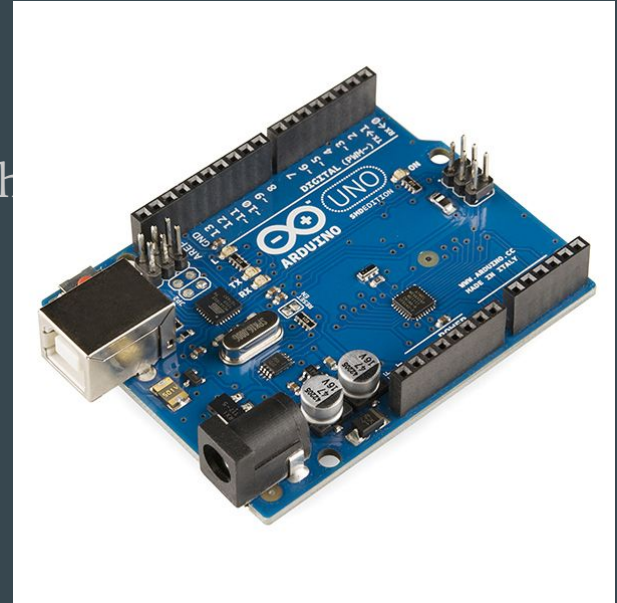- Understand the thought process behind Industrial Designers

Project Overview

- Initial Challenge - Learn how Industrial Design Students learn and create projects from scratch

- Learn how the Industrial Designer thinks compared to an Engineers mindset

- Find similarities between the Industrial Design students mindset compared to ours and figure out a way to make learning the Arduino more interesting

- Enable Industrial design students to incorporate technology such as Arduinos into their design.

- Create a systematic method for industrial designers to reference to when introducing new technology into the design.

What Our Project is Not

- Not a technical-focused project - We are learning from Industrial Design students

- We will have no functional design at the end of this school year

- A project we cannot finish without working along with Industrial Design students

We are working very closely with Industrial Design students and faculty; iterating as we go.

What is Industrial Design?

- A process of design applied to physical products that are to be mass produced.

DESIGN PROCESS INCLUDES

- Social (cultural,political,religious)
- Environmental
- Functional
- Financial
- Aesthetic Aspects

Examples of Industrial Design

Difference of Industrial Design vs. Engineering

- More emphasis on design and communication over technical specifications
- Prioritizes visual impact/usability/efficiency
- Industrial Designers have elementary knowledge of engineering principles, yet doesn't necessarily have the skillset to engineer the product themselves.

Empathy Map of Industrial Design Students

What the user says

- I am creative.
- I want to help people.
- I like to learn new things.
- I find programing overwhelming.

What the user does

- I learn what is necessary for the task at hand.
- I put my personal likes and experiences into my projects.
- I design, evaluate, and make changes as necessary.

What the user thinks

- Creativity can grow the more you use it.
- I can help the next generation make a difference.
- Failure is a learning experience.
- I'm not sure what an Arduino is or what it does.

What the user feels

- Learning is fun.
- Programming would be helpful, but I'm doing fine without it.
- I like Industrial Design because I can see and present my ideas physically.
- Learning programing would help me design a more functional project.

What the User Says

- I am creative.

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- I like to learn new things.

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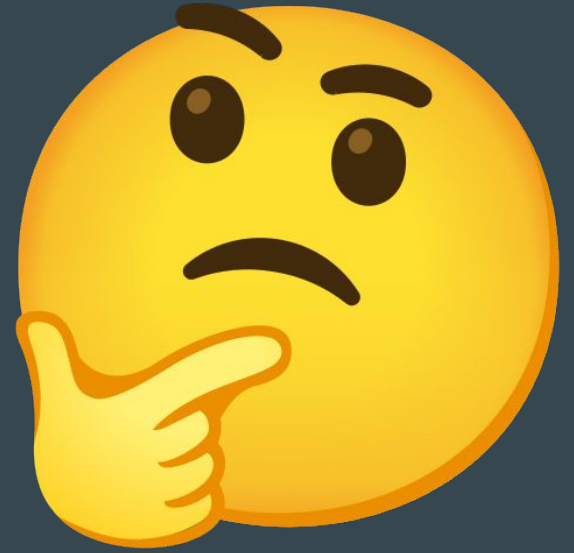- I design, evaluate, and make changes as necessary.

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Arduino Parts

- Motor + Motor Driver (10 wires)
- Servo Motor (6 wires)
- LED (resistor)

Functions

- Sensors
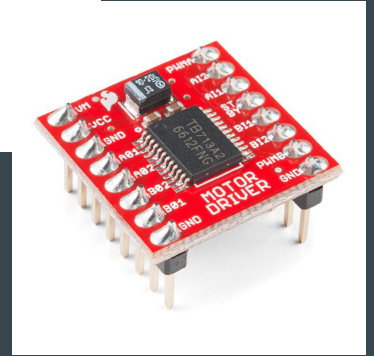- Sensor data processing
- Trigger on sensor

Example project

Parts provided:

- Motor
- Motor Driver

Things left open

- Structure
- What to do with them
- (cart, boat, windmill)

Moving Forward with Our Project

Giving example projects to Industrial design students

See how they react, what they are confused by

See if they can add other stuff without assistance

Iterate as the tests progress

- Dr. Mina's class with industrial design students

Any Questions?