Redesign Ceiling Fan Control

Purpose and Design Goals

Identify an existing control in life that needs to be improved. Redesign the control with regard of perceptual affordance, feedforward, and feedback.

I found the control of ceiling fan with pull strings to be not so user-friendly. My goal is to redesign a control for the ceiling fan system that provides better feedforward and feedback.

Interaction Design Studio 1, Section C
Assignment 1: Control Redesign
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September 19, 2017

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Research Phase

Search for bad designs of control in life

I first started by picking 20 poorly designed controls at school, nearby shops, and in my apartment. After analyzing their perceptual affordance, feedforward and feedback, I picked one with the most potential for improvement -- the ceiling fan control.

Original ceiling fan control

Perceptual affordance...

Good. The pull string communicates to the user that it should be pulled down.

Feedforward...

Poor. The two pull strings look exactly the same. (One for light, another for fan).

Feedback...

Poor. When the user wants to turn off the fan from 'High' mode, it is hard to tell immediately whether the fan is slowing down to 'Medium' mode or turning off by looking at its speed. The pull string doesn't indicate its current mode either, which often makes the user doubt whether he/she made the right action.

Competitive Analysis

Existing ceiling fan controls...

...with pull strings

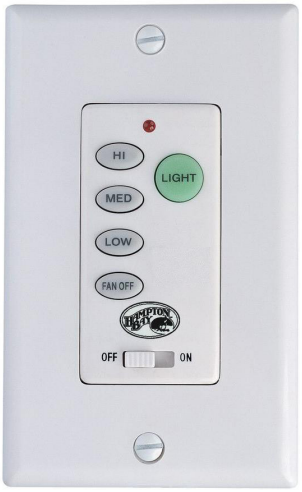
Pro:
Good perceptual affordance

Con:
Limited feedforward and feedback

... in wall

Pro:
Buttons with label provide feedforward & feedback

Con:
Uniform buttons are not appealing to users



Ideation Phase

Brainstorming and Sketching...

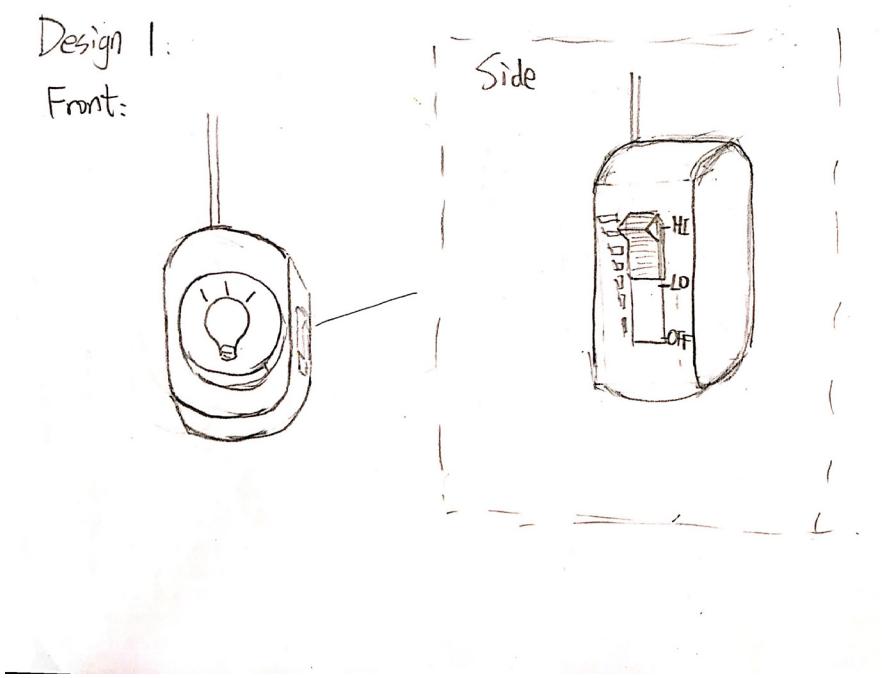
The goal is to add feedforward and feedback to the control by
1. making the light & fan control distinct and easy to identify.
2. show three different modes of the fan explicitly

So I started by creating 3 pencil sketches...

2 designs with **pull strings**

& 1 **wall** control

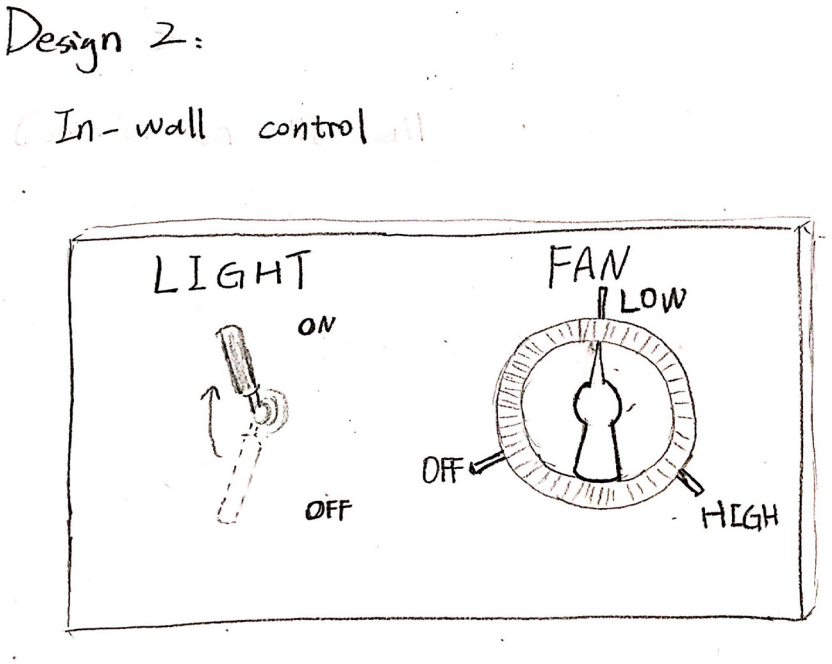
Design 1



In this design, I replaced the original two pull strings with one wire hanging from the center of ceiling fan. The control contains a push button with icon of light bulb in front, and a sliding switch on the right side.

Pro: simplicity and small size
Con: there's no indication that the sliding switch is control of the fan.

Design 2



The second design is a wall control with a trigger switch for light and control knob for fan. Each control & mode is clearly labeled.

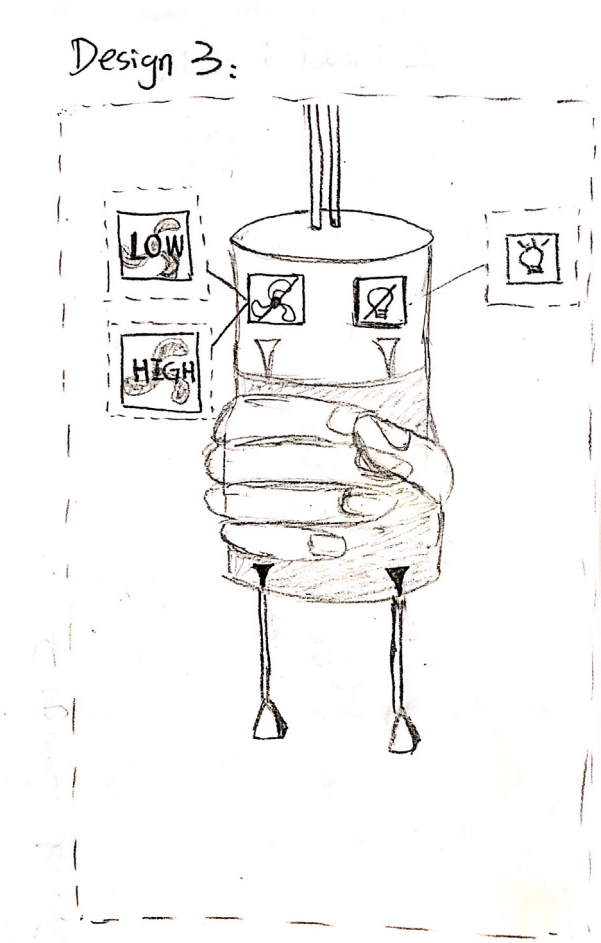
Pro:

Clearly communicates the functionality of each control switch.

Con:

A control with too many text labels seems boring.
Is there a more natural way to show the corresponding functionalities intuitively?

Design 3



The third design is based on the original control with 2 pull strings. I improved the original one by adding a handle which has label of fan on the left and light on the right. There are arrows pointing from each label to its corresponding pull string. The label will show its current state (light: ON/OFF, fan: OFF/MEDIUM/HIGH).

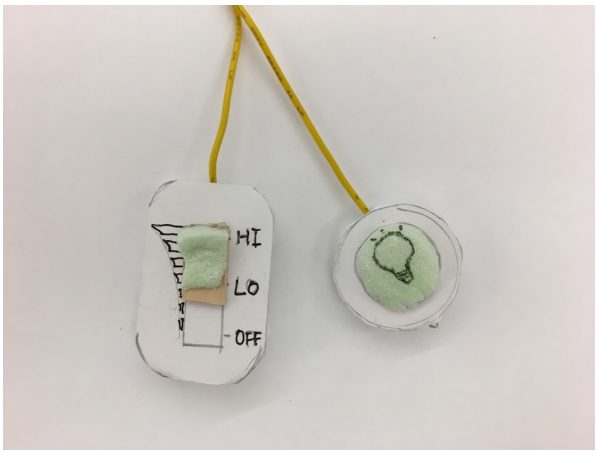
Pro:

Easy to change from the original control.

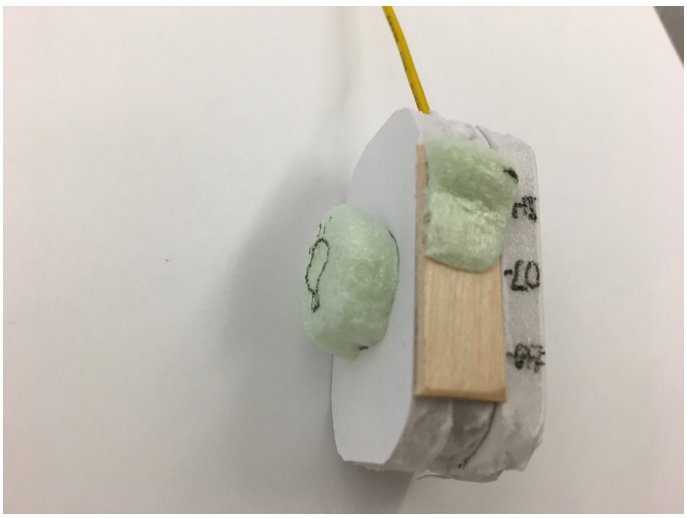
Cons:

1. The scale is too large for a control hanging from the ceiling fan.
2. All the information are on one side of the handle. User approaching from the opposite side still has no clue about the pull strings.

Three initial design prototypes

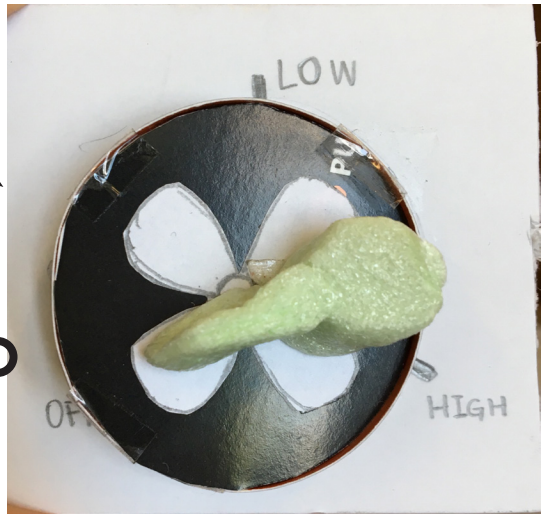


These are the 3 design prototypes I made while drawing the pencil sketches.

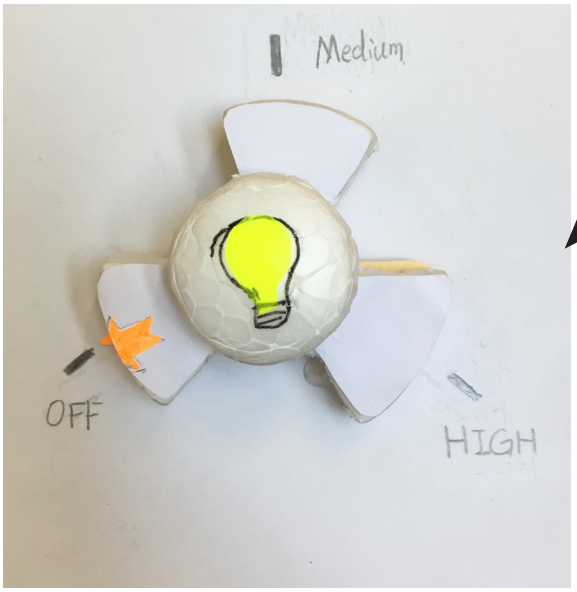


Iteration Phase

Critique...
...Refinement...



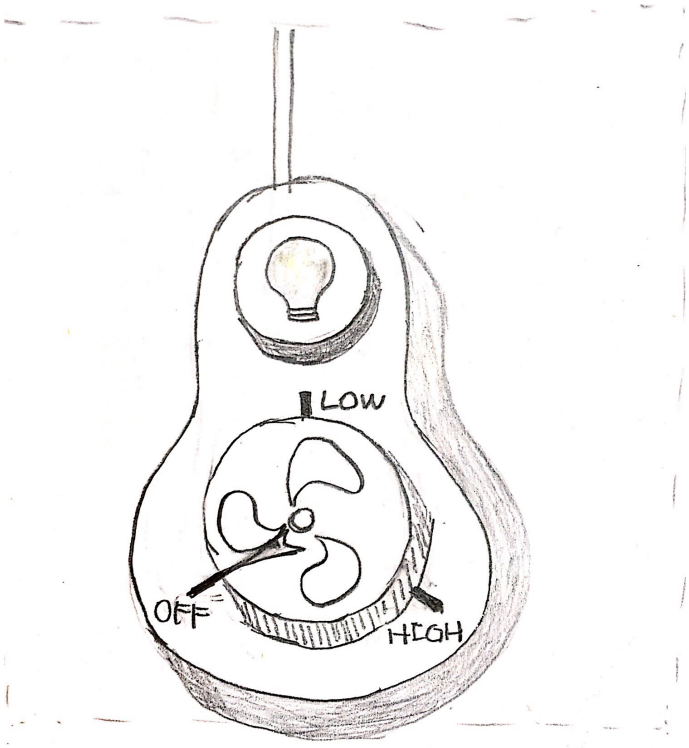
Critique...
...Refinement...

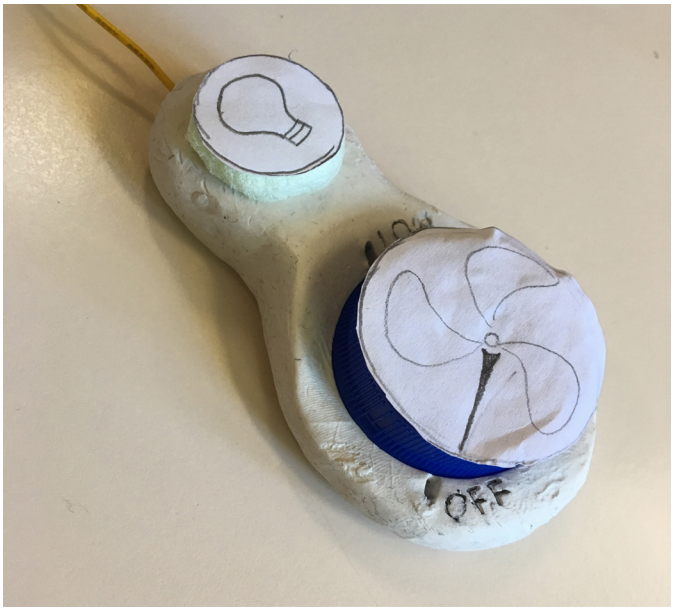


Critique...
...Final Design!

First Iteration

After reflecting on the first critique, I came up with a design that combined the strengths of the initial designs. It contains a push button for light and a control knob for the fan. Similar to the previous designs, it is hanging from the center of ceiling fan. The image label clearly communicates the correspondence to light/fan.

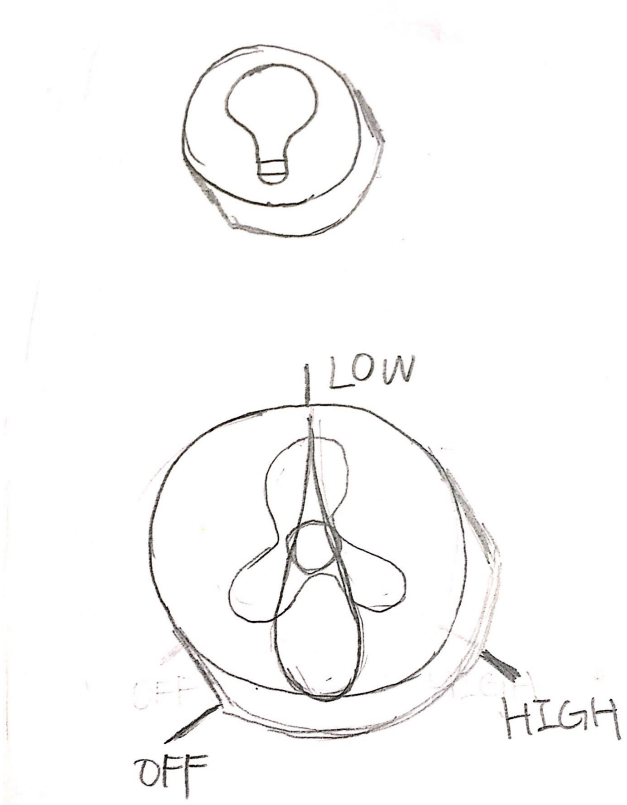




Pro:
Good perceptual affordance and feedforward.

Con:
Its scale is too large for a control hanging from the ceiling fan.

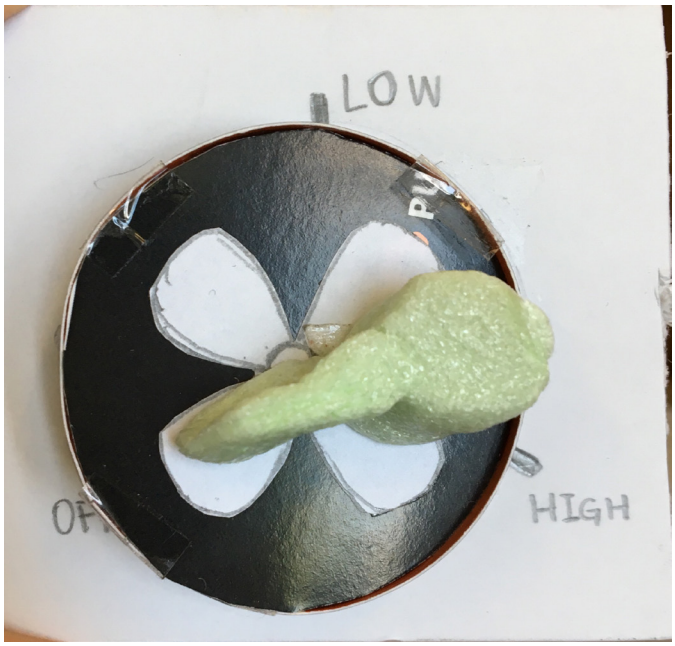
Second Iteration



To solve the problem with scale in the first iteration, I decided to get rid of the string mechanism and make a **wall control**.
The button & knob combination are similar to the first iteration. Since the three modes of the fan are discrete, I replaced the continuous control knob with a rotary switch.

Pro:
The location and scale are reasonable.

Con:
Looks similar to many existing wall controls in the market.

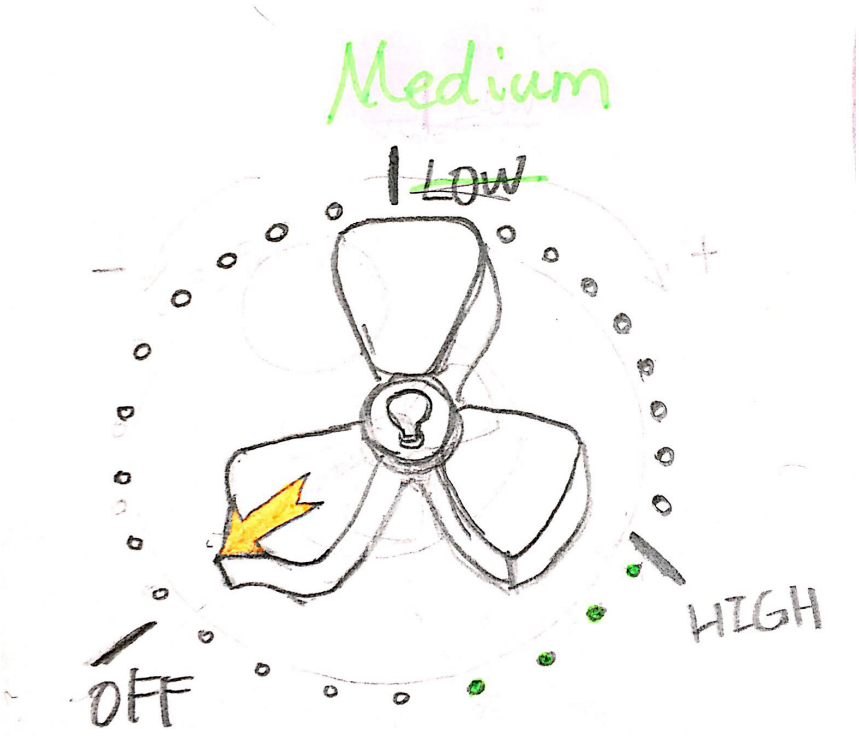


Is there a more creative design?

Yes, there is!

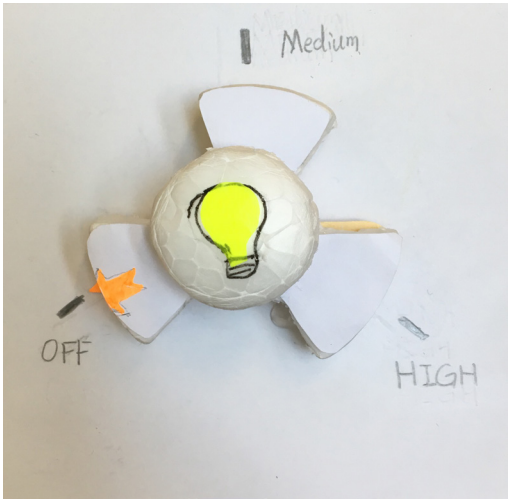
Final Design

While still sticking to the wall control, I changed the shape of the rotary switch so that it has three '**fan blades**', one of which ends with a arrow indicating it is pointing to the current mode of the fan. The push button for the light sits in the center of the fan control, with a label of light bulb image.



Therefore, the shape of the control now **resembles** the actual ceiling fan with light! The shape of a fan also offers users perceptual affordance to twist the switch. The arrow highlighted in orange along with the three mode labels provides feed forward for what the state will be in if the user twists to a certain label.

Comparison between original control and my final redesign



Perceptual affordance:

Original: Good. User knows he/she should pull the string to trigger some actions.
Mine: Good. A fan-shaped switch makes the user want to twist and a round button is a signal for 'push'.

Feedforward:

Original: Poor. It's hard to distinguish the fan control from the light one. The user also doesn't know what the next mode of the fan will be if he/she pulls the string.
Mine: Good. The user can easily tell which one is the fan/light control from the shape. The arrow and text labels clearly shows three modes of fan.

Feedback:

Original: Limited. Due to inertia, it is hard to detect which mode the fan is switching to by just looking at its speed.
Mine: Good. Though it's hard to obtain immediate response from the fan, the arrow on the control indicates which mode it is switching to.