Individual Assignment #4
Full assignment worth: 4% of course grade (*draft + final submission*)
Draft Due: Feb. 6 by start of class (worth 1%), NO LATE SUBMISSIONS ACCEPTED
Final Submission Due: Feb. 15 **by start of class** (worth 3%), 24hr late policy – 20% penalty.
Last modified: 31 January 2018

Overview

In this assignment, you should begin by going over the prerequisite reading and reviewing the previous design slides and assignments. You will also want to review the Greenberg "Ten plus ten" supplemental document (sourced from the Greenberg text).

The following sections of chapters 3 and 4 of the *OPTIONAL* Greenberg et al. text (*Sketching User Experiences: The Workbook*) may also be helpful in your completion of this assignment:

- In Section 3.2, you will learn how to draw what you see.
- In Section 3.3, you will learn to compose a collection of basic sketch elements.
- In Section 3.4, you will learn to compose "vanilla sketches" that include drawings, annotations, and notes.
- In Section 3.7, you will learn how to use *office supplies* to create sketches that are more easily modifiable.
- In Section 3.9, you will learn how to create photo-realistic sketches by tracing actual photos.
- In Section 4.1, you will learn how to build *sequential storyboards*.
- In Section 4.2, you will learn how to construct *state-transition diagrams*.

By having you read/review the above-mentioned sections/prerequisites and practicing the techniques they describe (additionally or via the previous assignments and in-class activities), this assignment has the following learning objectives:

- To learn how to draw what you see, as opposed to what you think you see.
- To learn how to compose simple objects out of basic sketch elements.
- To learn how to create basic sketches consisting of drawings, annotations, and notes
- To learn how to create photo-realistic sketches by using the photo tracing technique.
- To practice creating sketches of humanly-usable artifacts

Specific Tasks

1. Using the techniques described in class, including the "ten plus ten" design method, generate *multiple* design sketches for the following design challenge described on the next page. In generating designs, pay particular attention to the design concepts explored in class thus far:

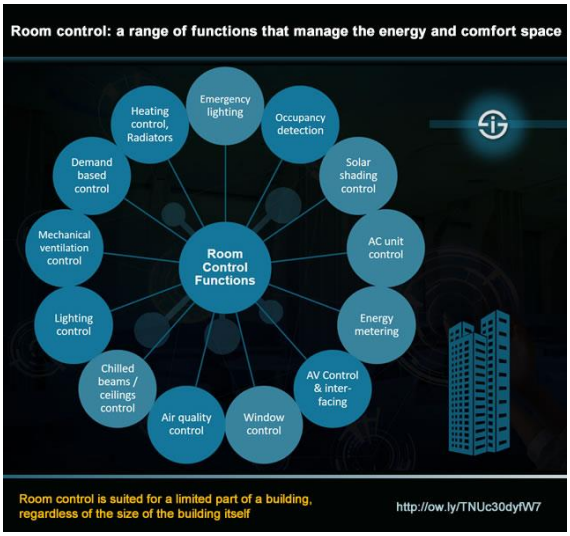
Norman Text	Johnson text
• Affordances • Signifiers • Feedback • Natural Mappings • Constraints • Conceptual Model • Visibility Additional consideration for: • Transfer effects • Gulfs of execution and evaluation	• Ch. 1: Human perception is biased – Avoid ambiguity in information displays – Be consistent – Understand users' goals • Ch. 2: Human perception optimized to see structure – Gestalt principles • Ch. 3: Humans seek and use visual structure – Impose visual structure on information displays • Ch. 4: Color vision is limited – Use color redundantly with other cues – Make sure colors are distinguishable, even for colorblind • Ch. 5: Peripheral vision is poor – Use a combination of movement, color, different font to make things stand out in periphery and optimize visual search • Ch. 6: Reading is unnatural – Avoid unfamiliar words, difficult fonts, poorly contrasting backgrounds – Minimize text in interfaces

Design Challenge: *Smart Home Manager*

Smart devices are becoming more and more prevalent in homes around the world. According to July 2017 research by Transparency Market Research the global market for home automation is expected to rise to a valuation of US$21.6 bn by the end of 2020. Even now there are many mainstream smart hubs and modular smart devices already available for consumer use and there is much debate as to which devices are the 'best' (e.g. the Apple HomePod, Amazon Echo, or Google Home).

Home automation revolves around the connection of many "smart" devices in and around your home, turning your home into a "smart home". A smart home is a house … consisting of automated, digitized and connected home assets, electrical services, controls and appliances across the home components and functions. These run within a communications network and enable an enhanced monitoring, comfort, energy conservation, maintenance, home activities and security of its occupants whereby the residents/owners have access to the resulting services and controls via special displays and controllers, which can take many forms such as built-in wall displays, proprietary devices, remote controls, various IT devices such as a computer, tablet or smartphone and/or multiple devices at the same time.

Source:
https://www.i-scoop.eu/smart-home-home-automation/



What might a single interface for such a smart home look like? How might home residents interact with their house full of devices digitally connected through that interface? One method might be through a centrally located interface in the home which provides monitoring and control of all smart devices connected to their home. In this design challenge, you will design a device to assist users living in a smart home to monitor and control their connected devices. This is the motivation for a device called *The Smart Home Manager*.

As the device's designer, assume that your interface will be a wall-mounted touch screen device. Your job is to design the layout of and user interface for **BOTH the physical wall-mounted device AND its touch screen display** while keeping in mind that the user will expect to be able to connect this device to an unknown (possibly unlimited) number of "smart" devices located throughout their home.

Here are the specific functional requirements of the device:

- *Users must be able set the date, time, and location.* Date, time, and location are a vital part of many smart devices! Many rely on accurate data to provide services and information.

- *Users must be able to configure other device settings.* It must be possible to configure other device specific settings, i.e. the smart home manager interface settings. Examples could be (***but not limited to***) device network connectivity (wired? wireless?), brightness settings, security, privacy, accessibility settings, etc.
- *Users must be able to add and remove connected smart devices.* One of the advantages of many smart devices is the ability to add and remove from the system as desired (i.e., they are not stand-alone devices). The interface must support adding and removing any compatible smart devices.
- *Users must be able to monitor all connected device statuses.* As a smart home user, it is expected that all connected devices should have a status (e.g. connection or other data made available via the connected device).
- *Users must be able to manually control individual devices.* Sometimes, a user will want to manually adjust individual device settings. The interface must support interacting with individual device settings (which will vary by device and supported feature set / available device APIs). At a minimum it should support on/off with the ability to handle more advanced control sets based on device complexity.
- *Users must be able to create, modify, and remove automated tasks.* A user must be able to input a specific automated task for any of their connected smart devices. Automated tasks should support (***but not be limited to***) time scheduled activation (on/off) as well as support for custom scripts to provide more advanced automation (e.g. via device APIs).

This assignment will proceed in two phases:

- By **Thursday, February 8** at the start of class, submit at least **two** alternative *preliminary designs* to the "IA#4: Draft" assignment in OSBLE. Some of you will have a chance to present your designs to the class for feedback and discussion. Based on those discussions, you'll have additional time in class to get feedback from peers and instructors, and to refine and update your designs.
- By Tuesday, February 15 **before the start of class**, submit one *final design* to OSBLE. Some of you will have a chance to present your final designs to the class for feedback and discussion.

You are required to present an *analysis* of each design you submit—both your draft and final designs. In your analyses, be sure to put each concept or principle you apply in **bold type**. There is no minimum or maximum limit for your analyses; just make an honest effort.

Assessment

Your draft assignment will be scored pass/fail based on whether you submit it (worth 1% of your course grade) and if you've demonstrated a reasonable effort in your designs, whereas your final assignment (worth 3% of your course grade) will be scored on the following four-value scale:

Points	Meaning	Description
0	Missing	Assignment not submitted, or submitted late
5	Incomplete	Assignment is incomplete or significantly deficient. Part of the assignment is missing or contains significant gaps.
8	Satisfactory	Assignment is complete but could be improved. Minor and obvious deficiencies exist with respect to one or more parts of the assignment
10	Exceptional	Assignment is complete and acceptable as is. No obvious deficiencies exist. The student has demonstrated mastery of the material.

Handing in your Assignment

Submit your report as a **.pdf** file through OSBLE by the due date (go to the "Assignments" tab to submit it).