CSCI 1300 – Iterative Design and Eye Tracking

Release Date: November 1st, 2018
Due Date: November 22nd, 2018 at 12:00pm (noon)
Late Pass Due Date: November 29th, 2018 at 12:00pm (noon)

Overview

You will be working in **a group of 3-4** students **to design an interface for an emerging startup**. This assignment is split into three parts, (1) **sketching ideas** of the interface, (2) converging into an **interactive, high fidelity prototype,** and (3) conducting **eye tracking** on this final prototype.

Note that this is a group assignment! One group member will be handing in a single submission to Gradescope on behalf of everyone in the group. **If your group wants to turn in the assignment late, understand that ALL group members must be willing to use up one of their late passes.** We recommend you discuss this with your group before starting the assignment!

Whether or not you already have formed a group or looking for other group members, please complete **this group form. At Sunday (11/4) noon, we are going to close this form, and if you still haven't submitted the form by this deadline, we will assign you to a group randomly. We will announce the pairing results via email and Piazza by the end of Sunday (11/4).**

You **CANNOT** have a mixed group of CS 0130 or 1300 students for this assignment!

Suggested Timeline

Task	Dates
Fill out this group form	ASAP (closes on 11/4 at noon)
Choose your startup! (Required)	As soon as you have your group
Sign up for eye tracking time slot (Required)	Released Sunday, 11/4 at noon
Sketches (Part 1)	By Sunday, 11/11
Your Mockup Presentation during Critique Sessions (Part 2)	Due in class Thursday, 11/15
Start Eye Tracking (Part 2)	Friday, 11/16
Gear Up Session for Eye Tracking Data Visualization (Optional)	Saturday, 11/17 2:00-3:00pm at CIT 269
Hand in the entire assignment	Thursday, 11/22

Selecting Your Startup Idea

For this assignment, you'll be working on designing a hypothetical interface for a recent startup of your choice. Find a startup from a recent YCombinator demo day (day 1, day 2), or Techstars, or from another startup accelerator. Pick a startup that has articulated a problem that it's trying to solve, while **ignoring any interfaces they've built already**. You'll come up with your own design using only their description. **Build from the ground up** – this is *not* a redesign! For example, Simbi is described as a "bartering marketplace" – you might design an app that lets people list goods for barter and accept/reject offers.

There is a **two group limit per startup**. Once you have found a group, one member should fill in **this sheet to claim your group's chosen startup**. If you have a startup you're passionate about, move fast and claim it!

Part 1: Sketching

Iterative prototyping is an essential aspect of creating user interfaces—it's impossible to come up with the perfect design in one go. Sketches help you visualize ideas in front of users and stakeholders, consider alternate designs, and avoid premature decision making.

It's often useful to come up with multiple sketches to contrast different ideas. These are basic drawings (not polished designs) of the elements of your interface, and are an inexpensive and easy way to make your ideas come to life. Refer to the Buxton reading and the Prototyping lecture in class for more about sketching.

Before you start sketching, **write a short introduction** including the **choice** of your startup, the **purpose** of your startup, and the **type of interface** on which you are choosing to design this startup (e.g. desktop app, mobile app, etc.).

Then, as a group, **make 4 sets of sketches, each of which should have at least 2 screens.** Each set of sketches should include the major screens of the interface (i.e. what you would need to perform a main function of the app/site), and be substantially different between each other. Your sketches should address the startup's goals in unique ways. You can either work as a group to come up with all 4 sets or can split up the sets among your 3-4 group members.

Make sure to keep or take clear photos of these sketches—you'll need to hand them in later.

Part 2: Mockups *(Due Thursday, 11/15)*

Overview

For this part of the assignment, **you and the same group of three to four people will make an interactive "high-fidelity" (hi-fi) prototype** based off the sketches you created in Part 1 of this assignment. Once this interactive prototype is complete, your group will present your work to

your classmates (and review other groups' mockups) in class on **Thursday, 11/15,** in a critique session (more information on this under the "In Class Critiques" Section below).

High-Fidelity Prototype

Before starting your mockup, re-read your startup scenario and make sure that your design decisions complement the startup's overall goals. In your group, look over your sketches and determine which aspects of the sketches work well and which don't. This will be helpful to keep in mind when writing about your design choices for your hi-fi prototype.

Your hi-fi prototype should be an improved iteration over the previous sketches, so it should look substantially different! A hi-fi prototype is more detailed and realistic than a sketch. It should look like the real finished product. Consider including example content and visuals of what the interface would look like if implemented.

You may use any tool for your prototype, but it **cannot be hand-drawn** (some options include Framer, React, HTML, InVision, Sketch, Illustrator, or any of the hi-fi tool labs from class). Make sure you include the main screen and enough screens to demonstrate the key interactions of your interface **(5-10 screens)**. You DO NOT need to include every possible screen.

Take into account the design principles discussed in class and the user observations, and **write a paragraph explaining your design choices. In this paragraph, also include thoughtful justifications of changes from original sketches, analyses of your critique session feedback, and changes made to your hi-fi prototype based off the feedback.**

Making it Interactive

Use any tool to make your prototype an interactive click-through, such as InVision, proto-io, Sketch, Framer, or Figma (no programming required for any of these). You may even consider adding animation with Framer or proto.io.

In-Class Critiques

Your group will present your prototype during class time on Thursday, 11/15. This WILL NOT be happening at our usual classroom, Granoff 110! You will be assigned a classroom before Thursday, 11/15, via email. Attending the in-class critiques is required and will provide 1 participation point. Each group will have *2-3 minutes* to present.

Slides are not required, but be prepared to give a live demonstration of your interactive prototype accompanied by explanations of your design choices. This is your chance to show off your work, and get helpful feedback from your classmates and TAs! Your group can make another iteration to your prototype if necessary before commencing with ***eye tracking sessions*** (Part 3 of the assignment).

Eye tracking sessions can be time consuming with limited time slots; thus we strongly suggest that after your critique session, you have the final version of mockups ***before your eye tracking time slot***.

Contact the Startup

Email the startup to share the final version of your mockup with them! CC your group members and the externally-accessible TA list (uiuxtas@lists.cs.brown.edu) in your email.Here's some text you can use to start your draft. Please revise it to suit your project and add something personal!

> *"As part of a UI/UX class assignment at Brown University, we were inspired by the description of your startup on TechCrunch. We designed an interactive interface that [text here about how your interface solves some of the problems]. If you have time to check it out, we'd love to know what you think, since you've been working on this a lot longer. Just thought to share!"*

Part 3: Eye Tracking

Eye tracking is a great way to understand how a user engages with an interface. For instance, you might think having a certain link on your page is really great, but what if the users fail to even notice it? With eye tracking, you can see what grabs the user's visual attention on the screen.

I. Formulate your Hypotheses

As a group, **create a task for your eye tracking participant**, then **form two qualitative hypotheses** and **explain your thinking**:

1. First hypothesize which area of your home screen users will spend time on the most. (1-2 sentences)
2. Second, hypothesize in which order you think the user will perform the task you created. (2-3 sentences)

   Ex) "*Our given task is to purchase the blue t-shirt. The user will spend the most time on the top middle area of the home screen due to an eye-catching image placed approximate to that area. In order to purchase a blue t-shirt, the user will arrive at the home screen, click on the Shop button on the navigation bar, scroll to find the blue shirt, click the button 'add to cart' on the right hand side, and then review their cart before clicking checkout. The buttons are all either in a text and an image formats, so the users will have no issue navigating to purchase the blue t-shirt. "*

II. Conduct Your Eye Tracking Tests

1. **Sign up for a time slot to use the eye trackers here.** Your group can sign up for only one 20 minute slot.
2. **Each group will bring in 1 participant** to the computers with the eye trackers set up in CIT 402. Your participant will browse through your final mockups based on the task you created. Participants must be from outside of your group.
3. During your time slot, if needed, a TA will assist you in getting the eye tracking data, which you will then analyze.

III. Analyze the Data

To analyze your eye tracking data, you will generate *a heatmap* (a still image that depicts where your participants' gazes were fixed) and *an animated replay* of their gaze motion, both overlaid on your interface so you can see what interface elements people were looking at. The steps are:

1. **Create a directory** where you want the stencil code to be downloaded.

2. From this directory, open a terminal or powershell and **run the following command**:

   ```
   git clone https://github.com/marshalllerner/1300-eye-tracking.git
   ```

3. Edit **heatmap.html** (for seeing a density map of where the users are looking)
   a. In a text editor, search for TODO markers and **fill in the rest of the code in the TODOs.** The result visualization should contain a static density map overlaid on your interface screen capture so you can see where the user was looking.
   b. This resource may be useful: heatmap example
   c. The background image of your visualization should be a screenshot of the final mockup of the homepage whose data you are going to overlay.

4. Edit **replay.html** (for making an animated replay of users' eye gaze movements).
   a. In a text editor, search for TODO markers and **fill in the rest of the code in the TODOs** so that your eye tracking animated replay is functional. You will render an animation of the eye tracking path of the user as if their eye is "drawing" on top of your interface. *(Imagine a pen leaving a trail exactly where your eye has been looking)*
   b. The background image of your visualization should be a screenshot of the website whose eye tracking data you are going to overlay.

5. If you do not have Python, **download** and install it for Mac or for Windows.

6. To test your code, open *Terminal*, **navigate to the folder that contains "heatmap.html,"** and **run the following command to launch your Python server:**

   ```
   If you have Python2: python -m SimpleHTTPServer 8000
   If you have Python3: python -m http.server 8000
   ```

7. Once your Python server is running, the visualizations will be displayed at this URL: http://localhost:8000/heatmap.html and http://localhost:8000/replay.html

8. For ***each*** screen **that was involved in the task you came up with**, take a total of **2 screenshots:**
   a. First, a screenshot of your **heatmap**.
   b. Second, a **final shot** of replay.html near the end of the drawing stage.

   You might not have screenshots for every single hi-fi screen that your group created, which is fine! Take **2 screenshots per screen that were involved in your task**.

Ex) During your eyetracking session, if your participant ends up looking at 4 screens to perform your task out of 9 screens you created, then you would need to hand in total of 4 x 2 = 8 screenshots.

9. **Include those screenshots with your modified stencil code in your final handin.**

10. **Interpret the results of your visualization**. Did the results match your expectations you set out in your qualitative eye tracking hypothesis?

★ *If you need help with this section, come to the special **Gear-Up Session for Eye Tracking Data Visualization** on **Saturday, 11/17, 2:00pm-3:00pm in CIT 269**!*

Grading and requirements

Remember that this is a group assignment! Only one group member will be handing in a submission to Gradescope, but all group members' names should be included in the submission!

Sketches (5pts)

- 1 points — Sets of sketches demonstrate solutions to the startup company's goals as described in your introduction.
- 4 points — Sets of sketches reflect creative ideas and alternate solutions to the startup's goals that are substantially different from one another.

High-Fidelity Prototype (9 pts)

- 3 points — Usability of final interactive high-fidelity prototype based on principles learned in class (remember to include a working link to it in your pdf).
- 2 points — Visual design of final interactive high-fidelity prototype based on principles learned in class.
- 3 points — Design explanations of the final hi-fi prototype with thoughtful justification of changes from the original sketches, analysis of your critique session feedback, and changes made based off the feedback, if there were any.
- 1 point — Professional email sent to the startup.

Eye Tracking (6pts)

- 2 pts — Qualitative hypotheses explained, and screenshots when performing your task.
- 2 pts — Zipped folder with **working** visualization code.
- 2 pts — Short write up interpreting eye tracking results that addresses original qualitative hypothesis.

Style (2pts)

- A short introduction including the choice of your startup, the purpose of your startup, and the type of interface on which your group chose to design this startup.
- Is this the quality of a portfolio piece? Would a stranger see this, understand it, and get something out of it? Review the style guide for details.