TheGivingTree

LOW-FI PROTOTYPE

CS 147 - Winter 2022

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INTRODUCTION

VALUE PROPOSITION

Make your donations go further.

MISSION STATEMENT

Our mission is to help donors donate easily and effectively to the causes they care about and track their donations over time.

PROBLEM AND SOLUTION OVERVIEW

From finding where to donate, to which charities are most in need, and then keeping track of these donations until tax season rolls around, giving is filled with pitfalls for the average donor.

We want to create a platform that takes the guesswork out of donating by automatically identifying high-impact nonprofits that users can donate to, letting them set up recurring donations, and managing donations long-term.

CONCEPT SKETCHES

Figures 1a-1c. Apple Watch realizations that experiment with geo tracking and purchase tracking.
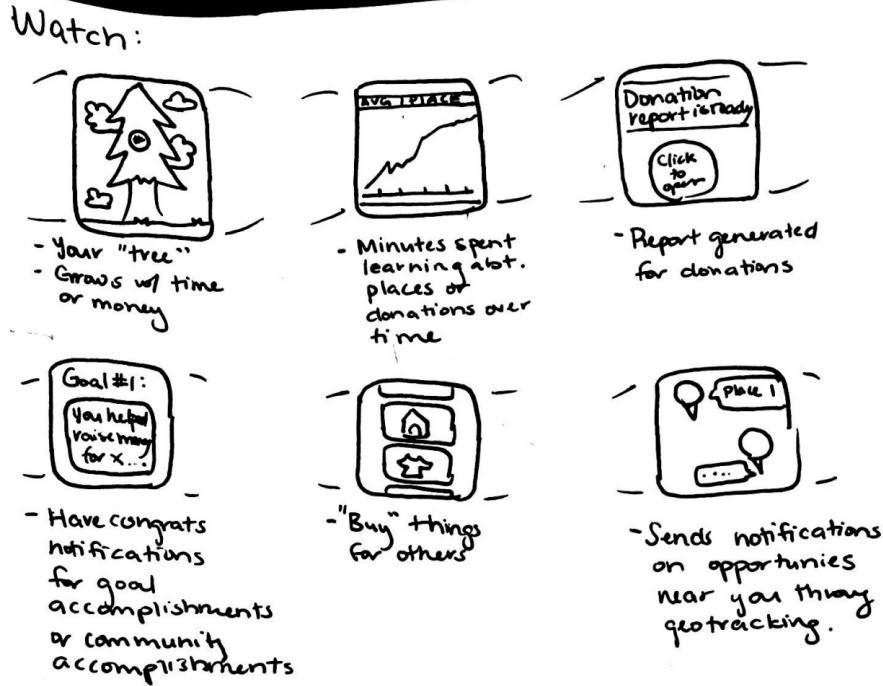

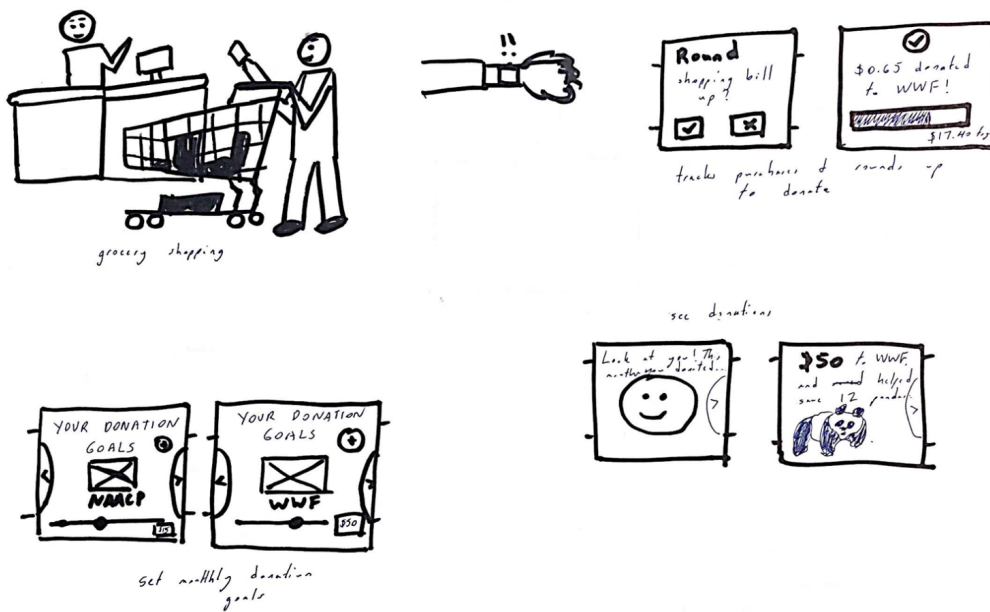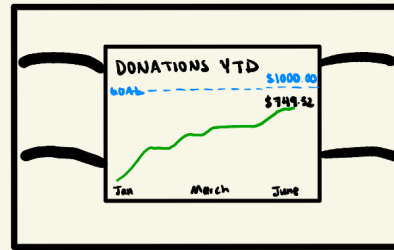**Figure 1a.** Apple watch interface with geotracking

Figure 1b. Watch with focus on tracking and rounding up purchases for donations.
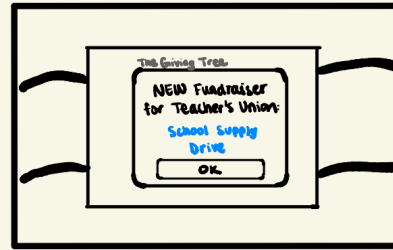
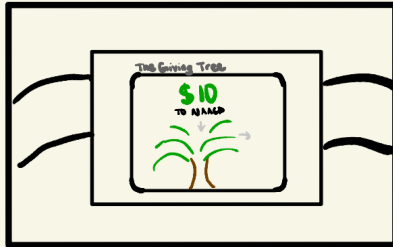**Figure 1c.** more interface design ideas for Apple Watch

Figures 2a-c. Mobile App with Tree Theme
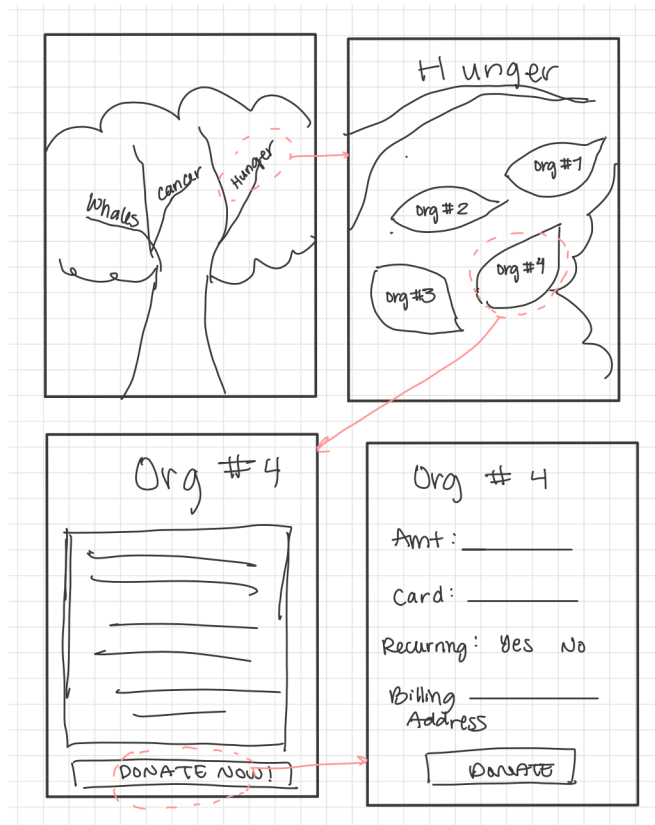
Figure 2a. Tree-as-navigation mobile app idea
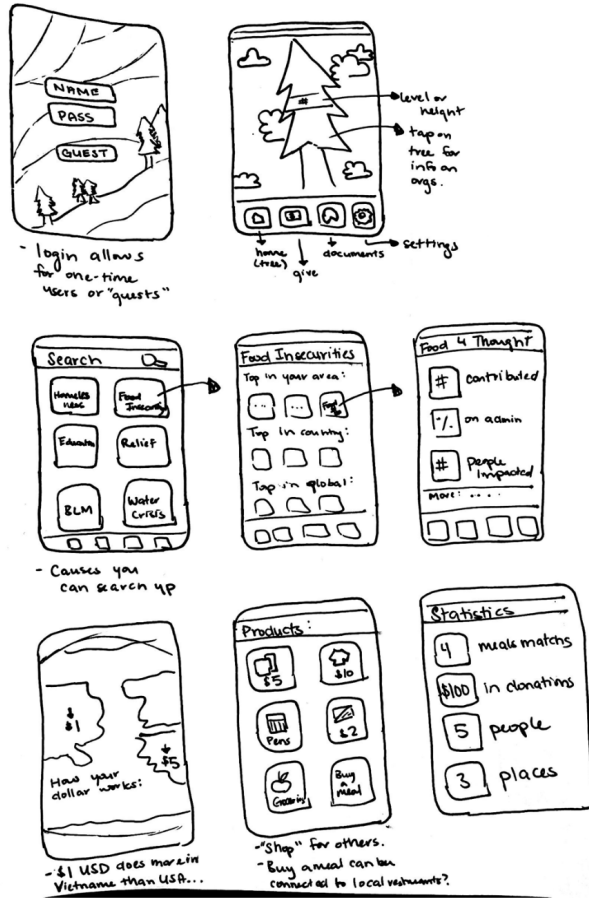
Figure 2b. More traditional navbar based navigation idea
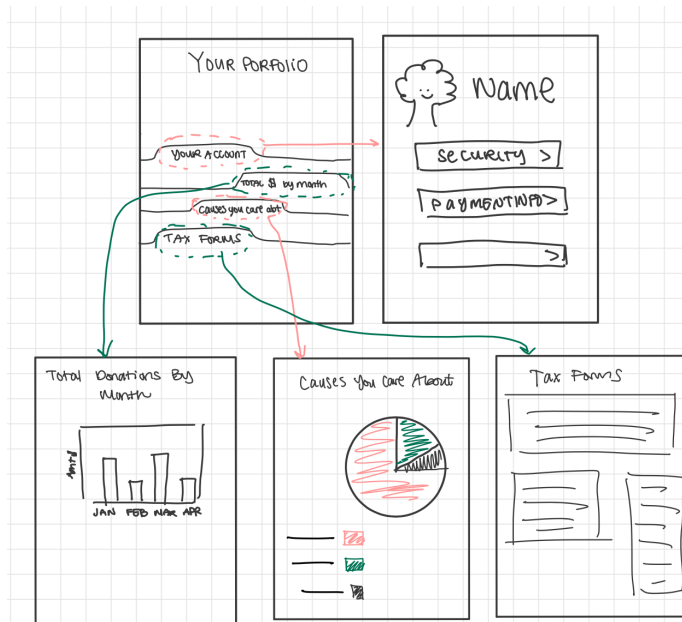
Figure 2c. Tree-themed portfolio interface ideas

Figure 3: AR realization to scan objects around you and learn about issues
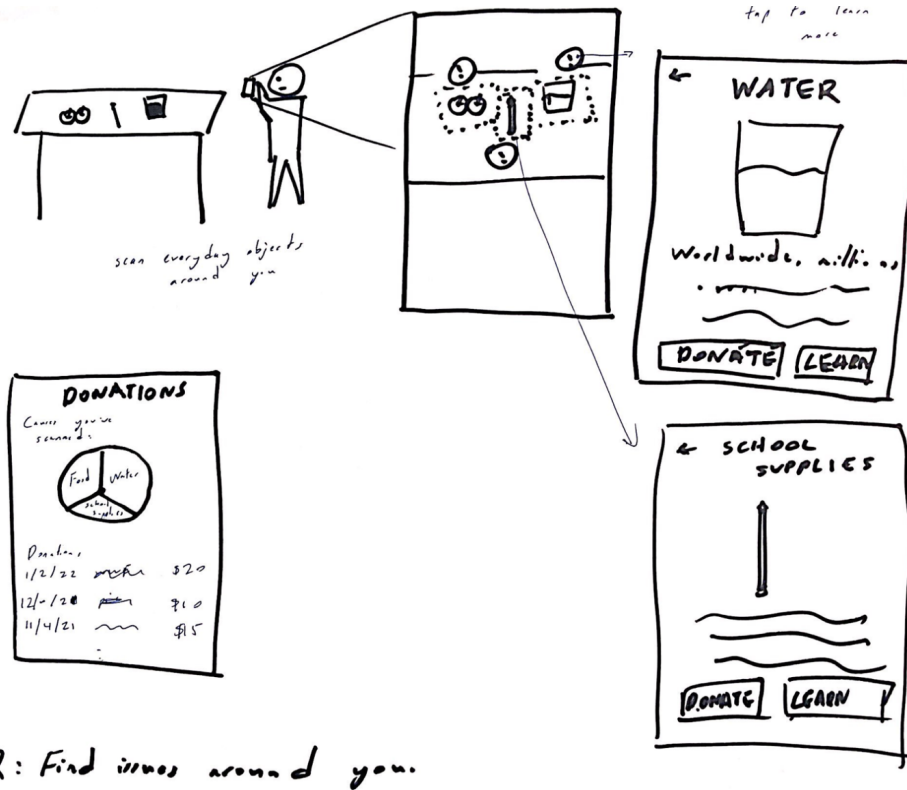
Figure 4: Gesture Based Mobile App Realization
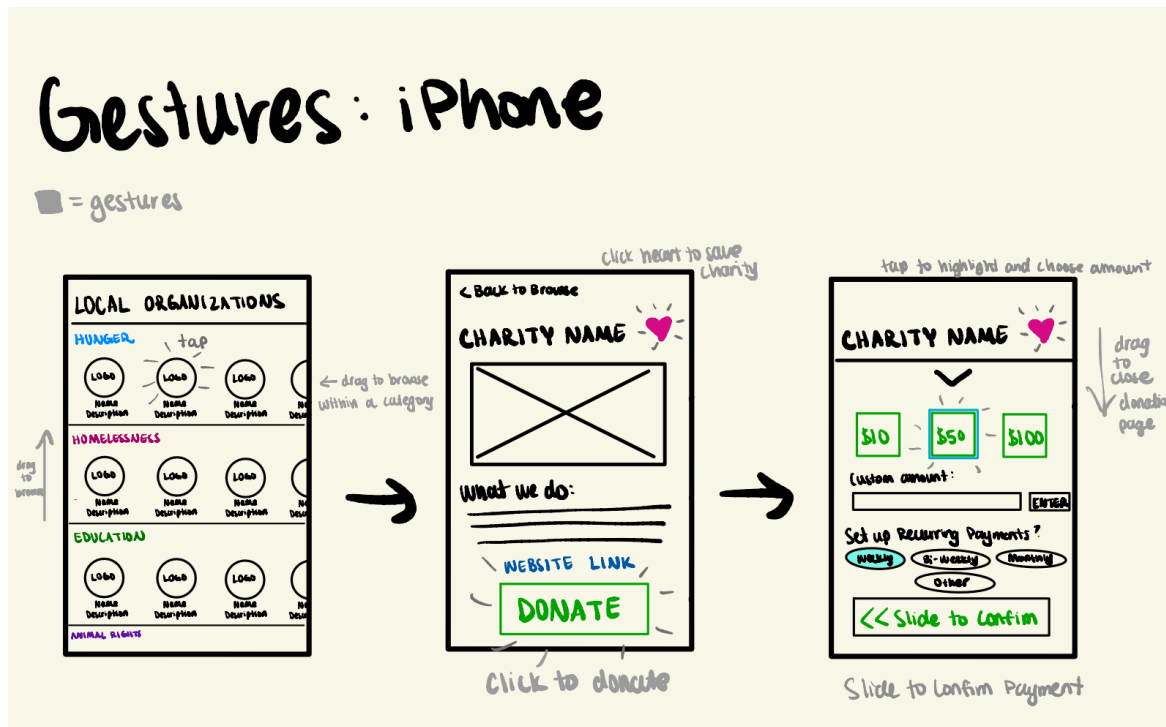
Figures 5a-b. Desktop realization ideas
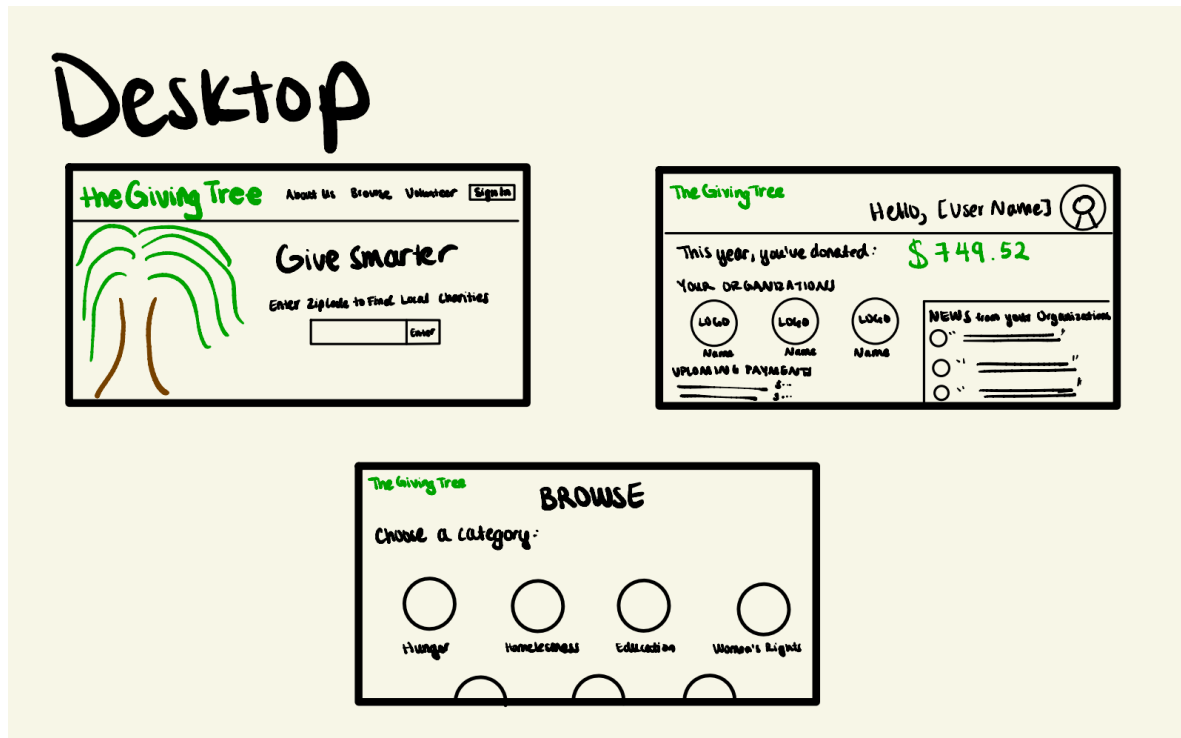
Figure 5a. Desktop interface idea focusing on simplicity and visuals
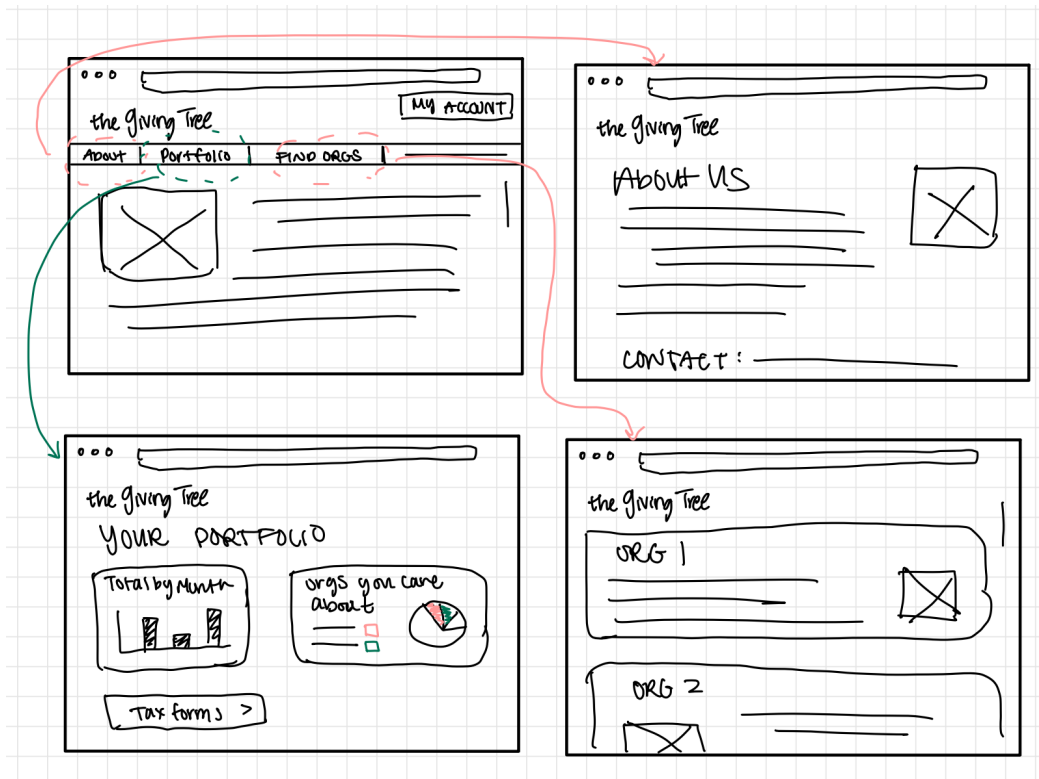
Figure 5b. Second desktop interface idea

Figure 6. Gamified Mobile App realization

TOP 2 DESIGNS IN MORE DETAIL

We combined multiple ideas from our Apple Watch and tree-themed mobile app realizations to create two designs to storyboard in more detail.
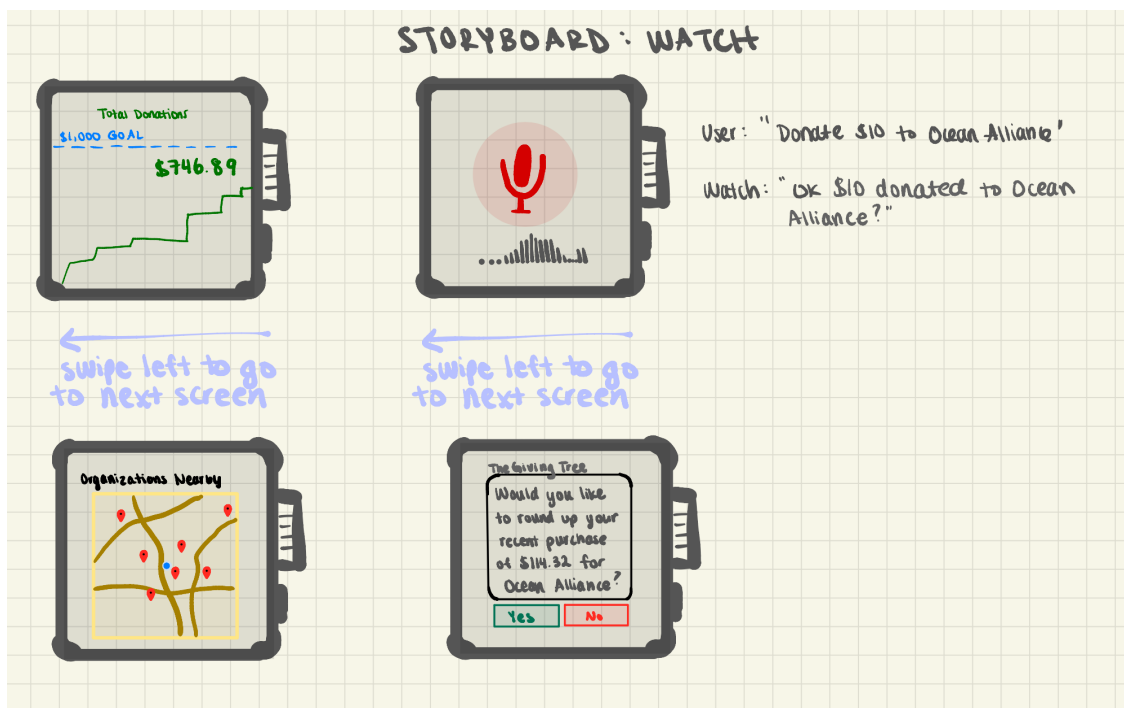
Figure 7. Apple Watch idea with voice control, location, and purchase tracking
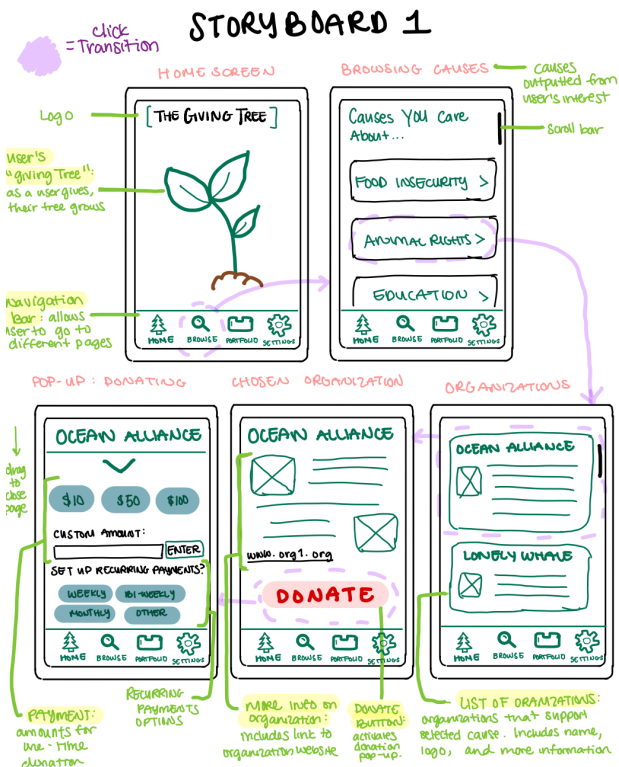
Figure 8a. Tree-themed mobile app for donating to a cause
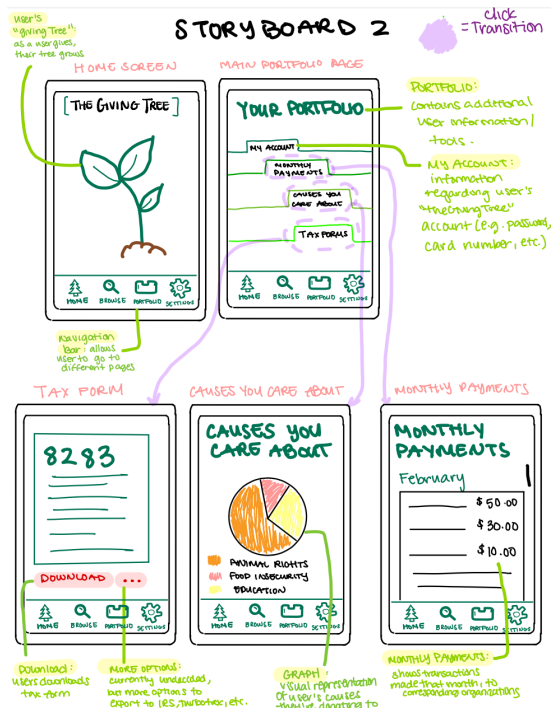
Figure 8b: Portfolio interface for tree-themed mobile app

SELECTED INTERFACE DESIGN

After our initial sketches, we considered the pros and cons of the Apple Watch versus the tree-themed mobile app.

APPLE WATCH APP

PROS	CONS
• Audio features allow for increased accessibility • Real-time notifications asking for donations • Quick visual summaries of activity on app • Location tracking allows for notifications of nearby organizations	• Can be invasive • Limited functionality because of the small screen • Cannot browse organizations • Some features are awkward on watch (i.e. downloading tax forms) because people don't use their watches for those tasks • Narrow audience

TREE MOBILE APP

| PROS	CONS
• Balances display size (for functionality like scrolling through causes or charities) with allowing users to donate on-the-go • Familiar, visual interface • Convenient and secure payment with touch ID • Tree as a visually appealing form of encouragement	• Some features are awkward on mobile (i.e. downloading tax forms) because people don't use their phone for those tasks • Smaller display vs desktop means more scrolling through causes or charities • Can increase difficulty in donations for the older generation

We selected the mobile app interface because the interface on a watch was too small to reasonably search and scroll through organizations and causes. While we could find ways to simplify the payment process, visualize the tree, etc. our team decided that it compromised usability in the core functionality

(i.e. donating, payments, etc.) too heavily. The watch would be a nice product to have but at most it would be a companion product, since it is also less accessible with a narrower audience.

Functionality (also see above annotations):
- Find and donate to organizations
- Browse causes
- Grow your giving tree through donations
- See donation portfolio
  - Download tax forms
  - View visual representation of causes you care about
  - Break down monthly donations
- Account settings to add payment

UI TASK FLOWS

Simple Task: (1) Find a charity under the cause "Animal Rights''. (2) Donate $10 to Ocean Alliance
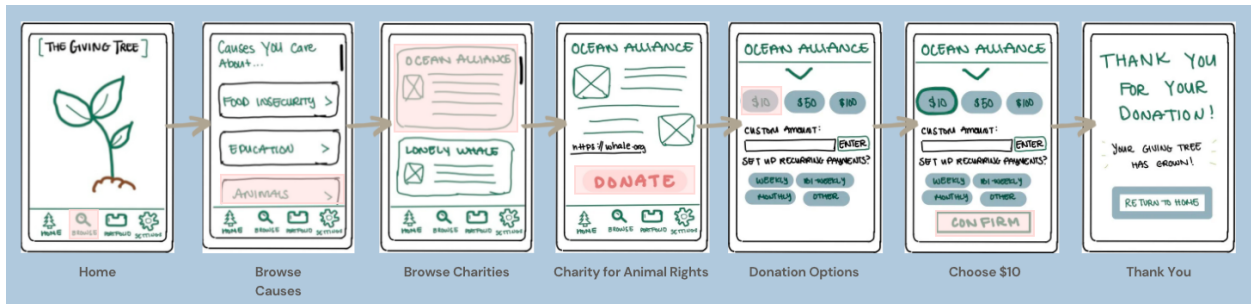
| Home | Browse Causes | Browse Charities | Charity for Animal Rights | Donation Options | Choose $10 | Thank You |

Medium Task: Setup recurring donations to Ocean Alliance for every Monday up to and including March 12th

| Donation Options | Choose Donation Frequency | Confirm Choice | Thank You |
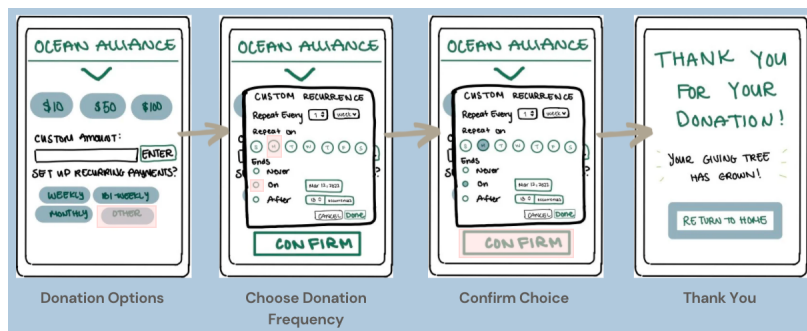
Complex Task: Find and download your charitable donation tax forms

| Home | Portfolio | Tax Form 8283 |
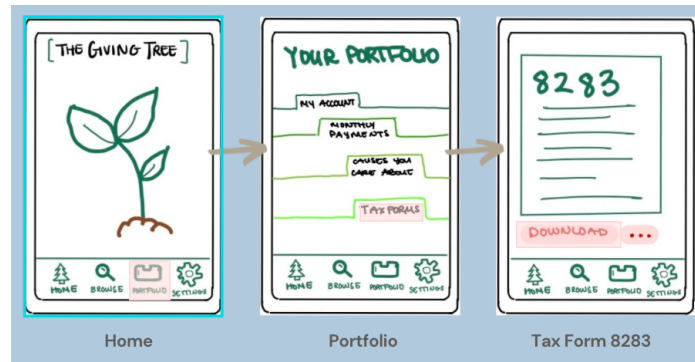
PROTOTYPE

We sketched our low-fi prototype on an iPad and uploaded the sketches to Marvel. The key interaction is touch input, and we wired up our sketches such that touching/clicking specified areas (i.e. buttons) would bring the user to the following screen. The prototype begins with a home screen with the user's giving tree (see FIgure 9). From there they can select buttons on the nav bar depending on the task. The first and second tasks involve the user donating to an organization, so they will browse the list of causes and find a charity. The final task involves the user viewing their donation portfolio and using the tax form feature.

Figure 9. Prototype home screen look
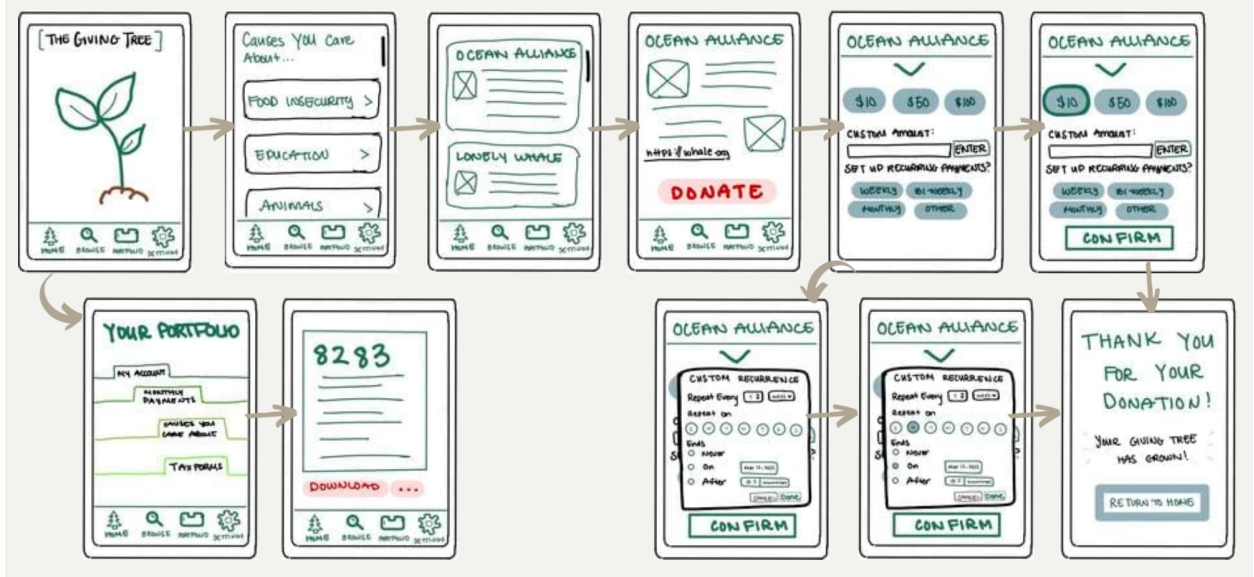
Figure 10. All prototype screens
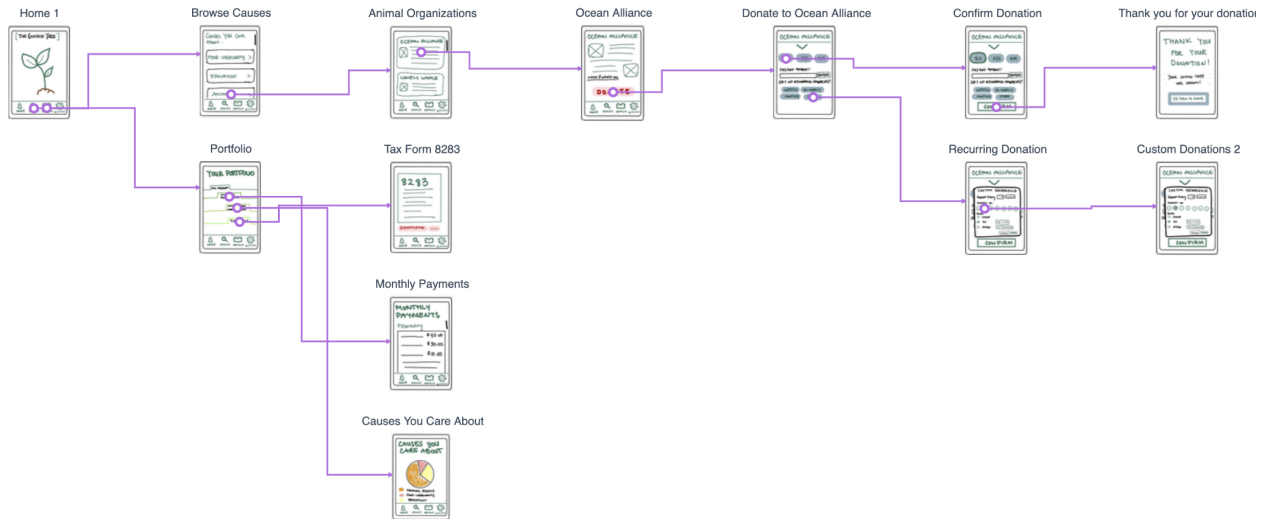
Figure 11. Whole connected low-fi prototype

TESTING METHODOLOGY

PARTICIPANTS

We interviewed:

- **P1:** 50s, East-Asian male, geo-engineer. Less familiar with technology, does not donate very often. Non-native English speaker.
- **P2:** Late 20s, Mexican and Cuban male, bartender. Very familiar with technology, does not donate very often.
- **P3:** Early 20s, White male, Stanford student. Very familiar with technology, does not donate very often.
- **P4:** 40s White female, social worker. Medium familiarity with technology, very active in charitable contributions.
- **P5:** Early 20s East-Asian female, college student. Very familiar with technology, does not donate very often.

We selected these participants due to their diverse backgrounds, different levels of familiarity with technology, and variety of past experience donating. All participants were recruited through second-degree connections (friends of family and friends of friends). Participants did not receive any monetary compensation, but we made sure to express our gratitude.

ENVIRONMENT

Tests were conducted over Zoom. Each participant interacted with our prototype on their own phones via Marvel while using their laptop to show us their screen. This enabled us to track their progress with the prototype, as well as any verbal reactions.
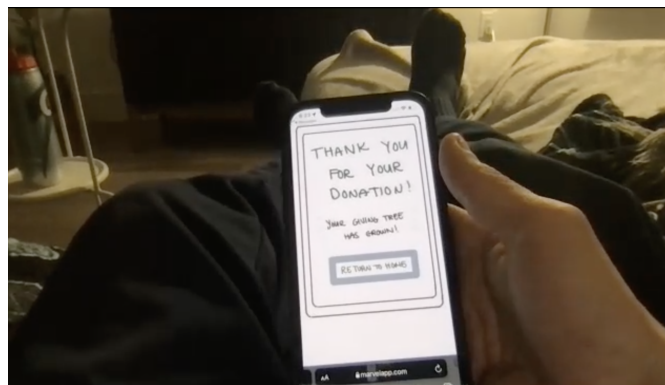
Figure 12. Experiment setup for participants

TASKS
1. **Simple task:** Donate to a cause effectively without having to do research on organizations
2. **Medium task:** Set up recurring donations for different causes or organizations
3. **Complex task:** See the organizations and amount you've donated to long-term and retrieve your tax-forms

USABILITY GOALS
- **Efficient:** we want users to accomplish tasks as quickly as possible
- **Robustness**: minimal error rates and users can recover from errors

PROCEDURE
1. Introduce ourselves, the class and project
2. Share and demo the prototype
3. Ask the participant to open the prototype link on their phone and to hug their laptop (so the camera is recording the phone) so we can see what happens
4. Give participants one task at a time, and ask them to think aloud as they accomplish the tasks.
5. After all tasks are completed, give participant a short exit interview

KEY & OTHER TEST MEASUREMENTS
Key metrics:
- Time to complete each task (efficiency)
- Minimal error rates (robustness)
  - Number of times per task the participant presses a wrong button or a non-button

Other things we looked for:
- Signs of understanding and joy (participant needs minimal guidance, confident and assured tone)
- Signs of confusion and uncertainty (participant asks interview for help, exasperated tone)
- Incorrect or unexpected actions
- Feedback from interviewees

TEAM MEMBER ROLES
Greeter / Facilitator: Britney/Nancy/ Lainey/Fernanda
Computer: Marvel
Observers: Britney/Nancy/ Lainey/Fernanda

RESULTS
TIME TO COMPLETE TASKS

Format: (time, # of errors)

	P1	P2	P3	P4	P5
Simple Task: donate	(0:35, 2)	(0:14, 0)	(0:24, 1)	(4:33, 5)	(0:30, 0)
Medium Task: recurring donation	(0:40, 0)	(0:27, 1)	(1:19, 2)	(1:15, 1)	(0:58, 1)
Complex Task: tax forms	(0:15, 0)	(0:08, 1)	(0:09, 0)	(0:12, 0)	(0:08, 0)

FEEDBACK
Overall, users really liked the simplicity and familiarity of the app's UI. The following summarizes the feedback we received for different parts of the app.

Home Screen
- Many were confused about home screen tree
    - Not sure what it had to do with donating
    - Thought it was an herb/leaf
- But others really liked that the tree grew when you donated, and wanted more customization options
- One tester wanted to be able to find causes directly from the home screen

Navbar
- Some were confused about the portfolio button and icon (not sure what it did)

- Everyone correctly identified the Home, Browse, and Settings icons
- Very intuitive, familiar, and testers liked that it provided an easy way to navigate around the app

Portfolio
- Easy and comfortable layout for all but one tester
- One user thought that the tax forms would be in settings instead

Finding Organizations
- Mixed feedback
  - Some liked the straightforwardness and simplicity
  - Others wanted a search bar and disliked the heavy reliance on scrolling
- Navigating through the donation page itself was seamless in all interviews

Recurring Donations
- Users struggled heavily picking between using the weekly vs custom calendar options

Other
- One user wanted back buttons + ability to swipe between screens
- Another wondered how to input payment information

DISCUSSION

Although the results varied by participant, our simple task of donating received a total of 8 errors with an average time of 1:15, the medium task of setting up recurring donations had a total of 5 errors with an average time of 0:55, and our complex task of reaching tax forms had a total of 1 error with an average time of 0:10. The higher error count and time for our simple task could have resulted from familiarity with the app or it may not be simple enough for a diverse range of users. The medium task had an acceptable, but not optimal, amount of errors and a time for completion, and improvements to minimize these results are necessary. Finally, our complex task proved most efficient and robust with very low error rates and time for completion.

Our research demonstrated important issues with the UI and usability of the app. While most of our participants were able to identify the functionality of the navigation bar, some mentioned that the portfolio button was unintuitive, specifically those less familiar with online financial accounts.

On the home screen, many were confused about the purpose of the screen itself and what the sprout at the beginning represented. The browse tab was labeled as the most self-explanatory. While our participants were easily able to donate on a one-time basis, the recurring task caused issues regarding what a "custom" payment was. In the portfolio tab, several mentioned liking the design and stated that once they clicked the button, it was more obvious what that bar indicated.

Moving forward, our team will look to add more visual cues and rethink how we represent the functionality of the tree and portfolio. In the browse section, we are planning on adding a search function to allow people to search up a charity or cause. Lastly, we will remove the ability to customize payments in order to simplify the process.

Overall, the participants found the app fairly intuitive, user-friendly, and visually appealing. However, we would like to make some cosmetic changes with the home screen and navigation bar, in addition to adding some functionality changes with the search bar and recurring payments for the future.

APPENDICES

CRITICAL INCIDENT LOG

0 - no problem
1 - small cosmetic problem
2 - minor usability problem
3 - major usability problem
4 - usability catastrophe

P1

Incident	Rating
Thought home screen background was a fresh herb	1
Correctly identified functions of home, browse, settings nav bar buttons	0
Did not understand portfolio button on the navbar meant/what it would do	3
Tried to scroll a lot (by habit?), nothing to scroll to	2
Browse was easy/intuitive to go to when wanting to donate	0
Thought "Causes you care about" page was confusing, expected to be able to search instead of just scrolling	3
Second time around to do a recurring donation was much easier navigating to donation screen	0
Liked portfolio page, the page was well-labelled and cards made sense	0
Did a double take to get to portfolio page (looked at page, then went back home, then back to portfolio page) like he was making sure it was still there	2

P2 - Jordan

Incident	Rating
Thought the tree made the app look like a gardening app	1
Liked the simplicity of design	0
Found the navigation bar familiar/intuitive	0
Correctly identified intended functionality of each navigation icon	0
Finding an organization for a particular cause was easy	0
Did not press "confirm" when making a donation to complete donation task	2
Liked that there were multiple preset options for donation amounts	0
Found donating a particular amount to a certain charity easy	0
Did not realize there was a custom button to set up recurring donations on specific days	3
Clicked "weekly" instead of "custom" for task 3	3
Rated setting up a recurring donation medium difficulty task	3
Thought the tax form would be in the settings, not in the portfolio	2

P3

Incident	Rating
Portfolio logo could be more self-explanatory	1
Feels pretty similar to other UIs	0
That's fun that the tree grows	0
Couldn't figure out if the calendar was inclusive or exclusive and was confused	3

about that	
Back buttons would be useful or swiping which is more intuitive	2
Wants an option to choose a tree	1

P4

Incident	Rating
Correctly identified functions of home, browse, and settings nav bar buttons	0
Confused by portfolio button. Couldn't figure out its function through the icon or the word 'portfolio'	3
Did not like the home page because looking at the tree doesn't make her think its a donation app	3
"Browse means search right"	2
A lot of reading on the causes you care about page	2
Tried to scroll when confused	2
Got to the charities page but did not know how to proceed to donate (clicking the Ocean Alliance box was unintuitive and had to ask facilitator for help)	4
Expected to be able to key in payment to donate (Facilitator asked P4 to pretend this step had already been done)	4
"Ohhh" little bit of awed surprise when clicking the donate button	0
Second time doing a recurring donation was much more painless navigating to the donation screen	0
Once portfolio tab was clicked and she started reading the labels, "ohhh" sounded like she understood what portfolio was for	0

Incident	Rating
Wasn't really sure what the portfolio breakdown of "causes you care about" screen meant (I think the participant had trouble personally relating to the causes "I don't really care about animal rights", so she thought it was causes other people cared about)	4
Wasn't really sure why settings might be needed	2

P5

Incident	Rating
Thought icons were very straightforward and represented the main features of the app.	0
Navigation bar made it easy to see everything on one screen.	0
Correctly identified how to browse and donate to charities.	0
Identified the structure of the browse page correctly (charity, charity name, information of charity, picture)	0
Correctly able to donate $10.	0
Said not much instruction was needed for navigation.	0
Correctly guessed the plant on the homescreen would grow.	0
Was slightly confused with whether to select "biweekly" or "other" to complete recurring payments task.	3

BLANK CONSENT FORM

Consent Form

This student team is interviewing and observing as part of the coursework for Computer Science course CS 147 at Stanford University. Participants provide data that is used to understand the possible opportunities of the design. Data may be collected by interview, observation and questionnaire.

Participation in this experiment is voluntary. Participants may withdraw themselves and their data at any time without fear of consequences. Concerns about the experiment may be discussed with the researchers ([TEAM MEMBERS NAMES HERE]) or with Professor James Landay, the instructor of CS 147:

James A. Landay
CS Department
Stanford University
650-498-8215
landay at stanford.edu

Participant anonymity will be maintained by the separate storage of names from data. Data will only be identified by participant number. No identifying information about the participants will be available to anyone except the student researchers and their supervisors/teaching staff.

I hereby acknowledge that I have been given an opportunity to ask questions about the nature of the research and my participation in it. I give my consent to have data collected on my behavior and opinions in relation to the [TEAM NAME HERE]'s research.I understand that I may withdraw my permission at any time.

I give consent to be videotaped during this study:
        ___Yes   ___No
I give consent to be audiotaped during this study:
        ___Yes   ___No
I give consent for video or audio recordings from this study to be shown to people not directly involved with this research during/in class, seminars, reports, or scientific presentations.
        ___Yes   ___No

Name _____

Participant Number _____

Date _____

Signature_____

SCRIPT

Experimenter: Hi, thank you for taking the time to meet with me today. We're students taking a human computer interaction course at Stanford, and are testing a mobile donation app named theGivingTree. For the procedure today, I will ask you to use your phone to complete a few tasks on the app. As you complete the tasks, I'd like you to talk aloud as much as possible about what you're thinking as you go through the app. Just to make sure, do you have a phone available to use today?

User: [Answer]

Experimenter: Great! Do you have any questions for me before we begin?

Experimenter: Okay, great! [SEND LINK TO PROTOTYPE]. Feel free to open the prototype link on your phone. If possible, I'd like you to hug your computer, so that your webcam is facing your phone screen, so I can see what you're doing as you do it. Again, just as a reminder, I'd love to hear any thoughts you have as you move through the app aloud.

Experimenter: What do you think this screen is?

User: [Answer]

Experimenter: What do you think about this screen? Anything you like or dislike?

User: [Answer]

Experimenter: Can you explain to me what you think each of the buttons in the navigation bar do?

User: [Answer]

Experimenter: What do you think about the navigation bar?

User: [Answer]

Experimenter: Okay, now for the first task, can you show me how you would go about finding a charity for a particular cause, with that cause being Animal rights? Tell me when you think you have completed the task.

User: (does task)

Experimenter: Okay. How would you rate that task on a scale of 1 - 3, with 1 being easy and 3 being hard. Any why?

User: [Answer]

Experimenter: Now, can you show me how you would go about donating $10 to Ocean Alliance?

User: (does task)

Experimenter: Okay. How would you rate that task on a scale of 1 - 3, with 1 being easy and 3 being hard. Any why?

User: [Answer]

Experimenter: Now, can you show me how you would set up recurring donations to Ocean Alliance for every Monday up to and including March 12th?

User: (does task)

Experimenter: Okay. How would you rate that task on a scale of 1 - 3, with 1 being easy and 3 being hard. Any why?

User: [Answer]

Experimenter: Now for the last task, can you show me how you would go about finding and downloading the Tax Form 8282 for Charitable Donations?

User: (does task)

Experimenter: Okay. How would you rate that task on a scale of 1 - 3, with 1 being easy and 3 being hard. Any why?

User: [Answer]

Experimenter: Now that the tasks are completed, do you have any feedback for us about what you liked or what we could improve?

User: [Answer]

Experimenter: Were there any points of confusion while completing the tasks?

User: [Answer]

Experimenter: Do you have any final questions for me?

User: [Answer]

Experimenter: Thank you for taking the time to meet with me today. I will now end the recording.