

Travel Teddy

Low-fidelity Prototyping Report

Joseph P, Carla R, Karen W

Introduction

Mission Statement & Value Proposition

Travel Teddy is a mobile app and teddy-bear AI interface that educates and entertains children during travel with location-relevant information. Parent-controllable interaction modes direct children's attention to the real world outside the window instead of simply distracting them with a shiny screen. Our value proposition is to "make traveling with kids BEARable!"

Problem & Solution Overview

During our needfinding process, we found that every parent struggled with keeping their kids entertained during long trips. At the same time, parents did not want to expose their kids to technology, which agitates young children and reduces their attention spans. After many prolific rounds of ideation, we proposed the solution of creating an interface that would facilitate the kid's interaction with the local environment they are traveling through, while freeing the parent to focus on keeping their eyes on the road. This interface would be fully customizable by the parent, from the level of interaction to the content their kid is exposed to, to allowing their parents to contribute content to a crowdsourced library.

Sketches

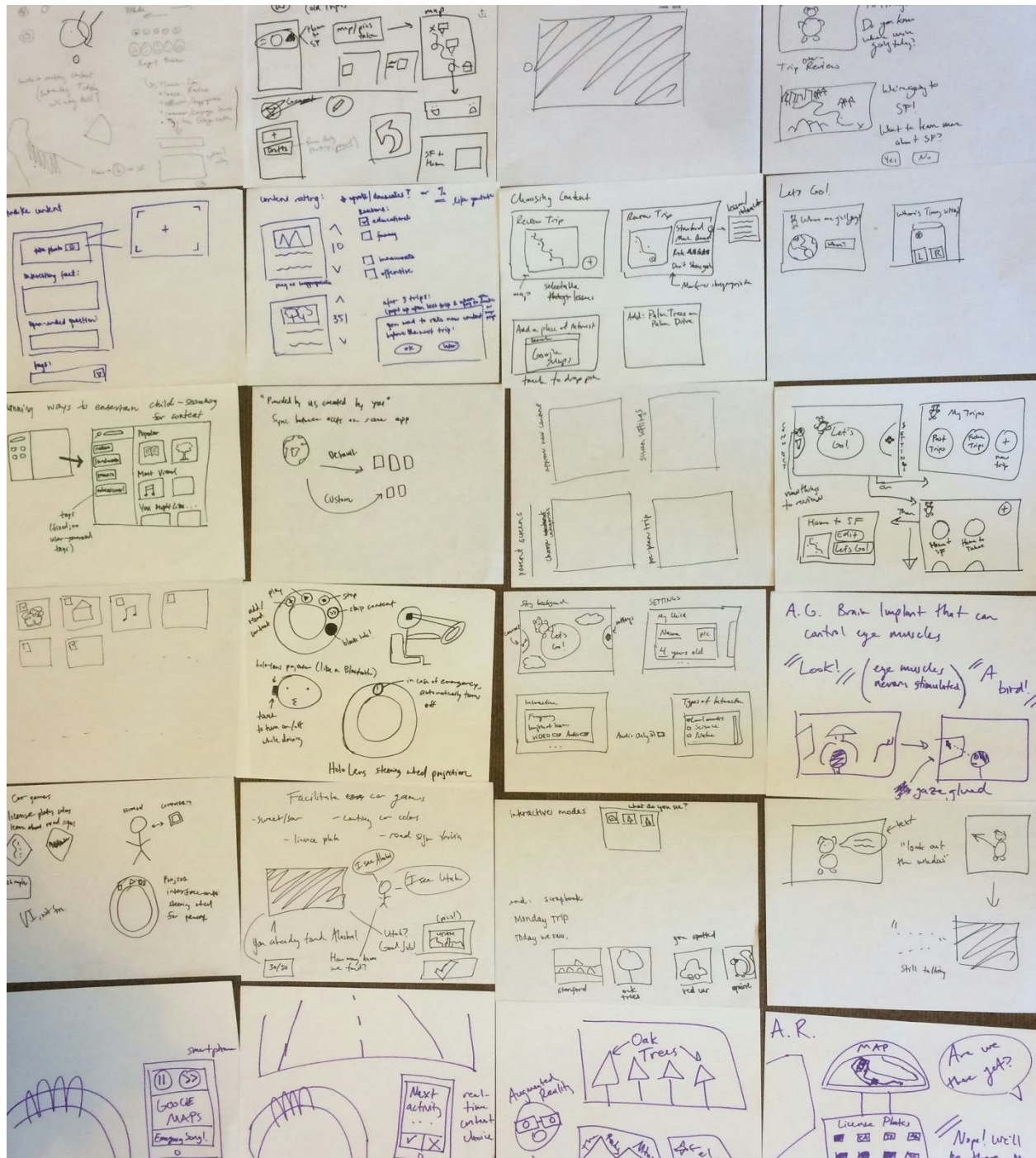


Fig 1: Overview of design sketches.

Storyboards of Top Two Ideas

Our first idea we chose was to create an tablet app with two different modes: a “parent” mode to control settings and content, and a “child” mode that the parent turns on before giving it to their child. The “child” mode would have a black screen for the majority of time, except for brief intervals when the child could interact with it by playing a game or some other activity.

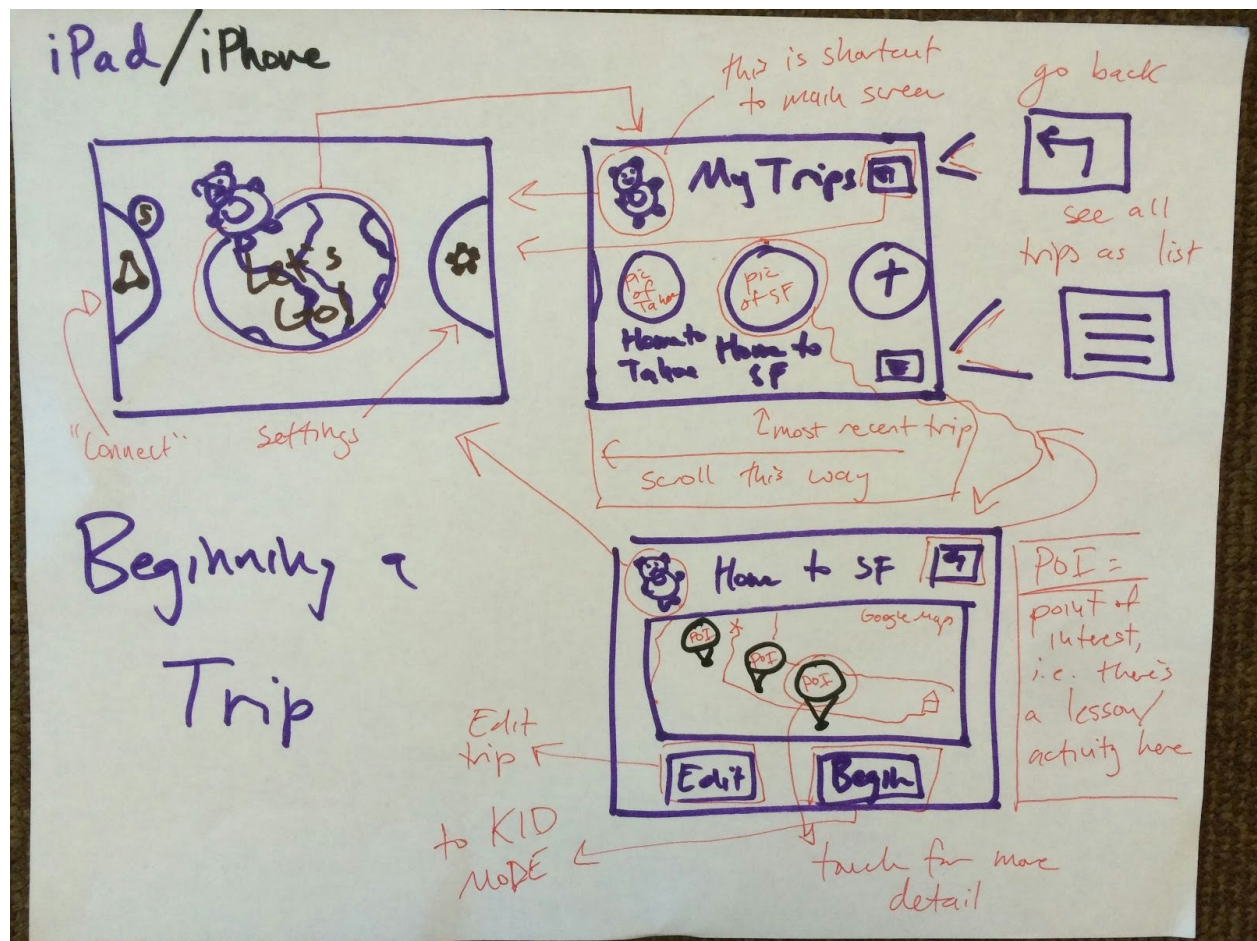


Fig 2: Design idea #1

Our second idea was to separate the two modes in a mobile app for the parent, and a hypothetical animatronic teddy bear for the child. The mobile app would control settings and content that would then be relayed to the teddy bear. (This idea was inspired by the teddy bear in Steven Spielberg's *Artificial Intelligence* movie.)

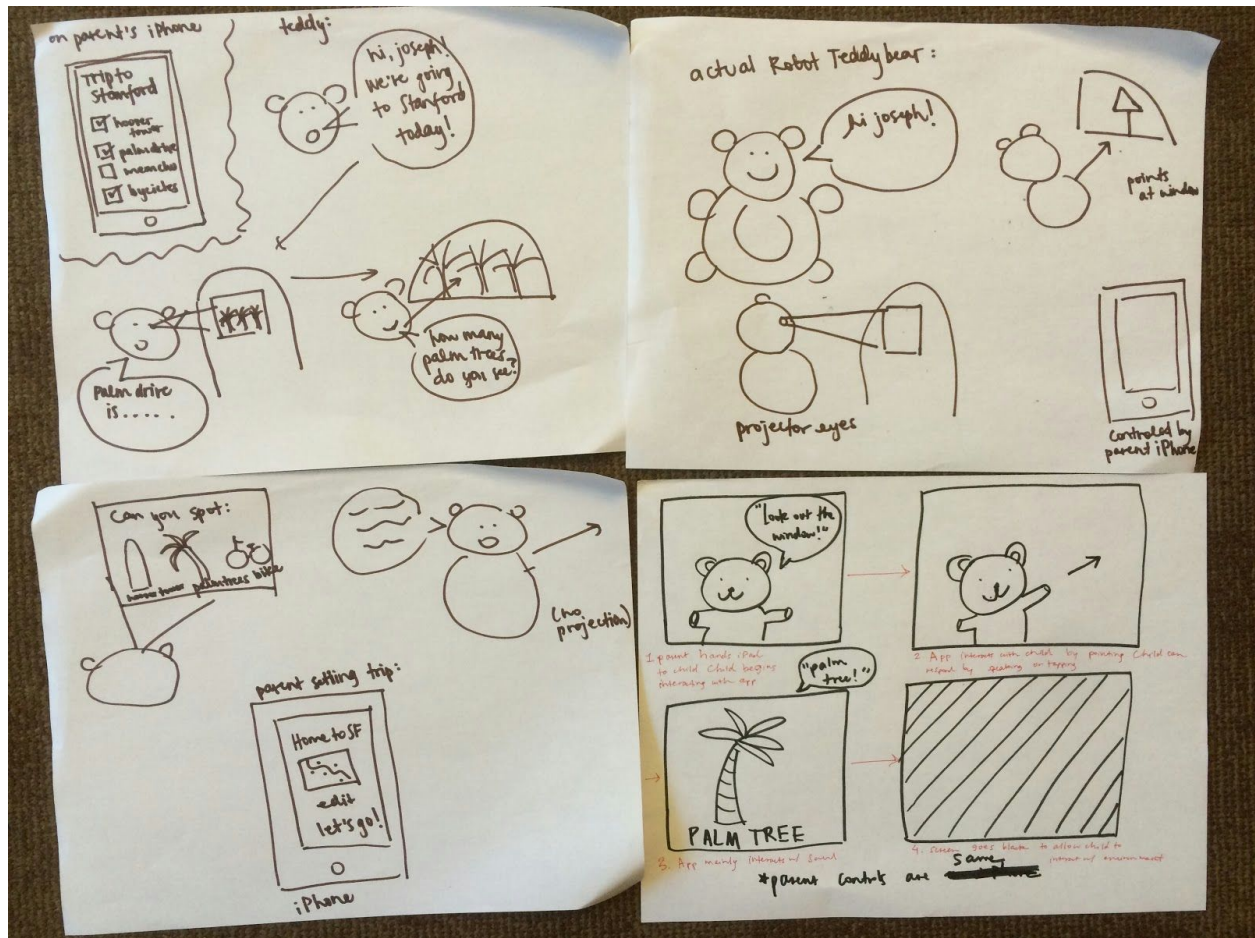


Fig 3: Design idea #2

Selected Interface Design

Reasoning

We chose to proceed with the interface explored in our second idea: using a mobile app in conjunction with an animatronic teddy bear. We agreed that this interface addressed more effectively one of the main problems we discovered: that parents did not want their kids interacting with screens. Our first idea attempted to mitigate this by maintaining a blank screen for the majority of the time. However, in hindsight, this seemed to us more as a band-aid than a permanent solution to this huge problem. We rationalized that rather than a screen, it would be more natural for kids to directly interact with a teddy bear or other stuffed toy that they can see, hear, and touch. Thus, although we will not be able to build such a teddy bear in the constraints of our project, we decided to proceed with this idea with the intention of building the mobile app interface for parents to use.

Storyboards For Three Tasks

Simple: Preparing content for the trip. Our storyboard takes the parent through the necessary steps to make a trip and choose content for it.

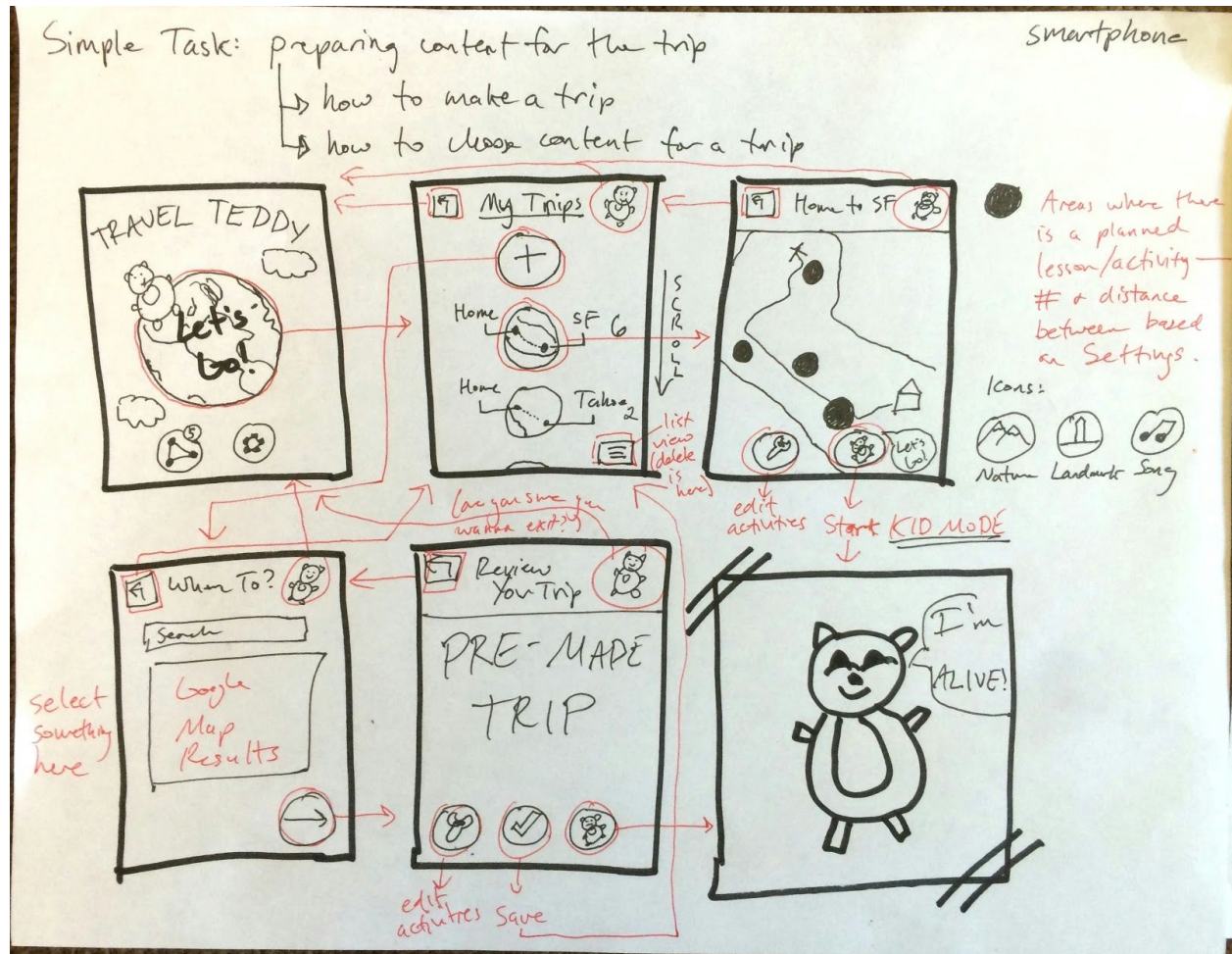


Fig 4: Simple task storyboard

Moderate: Keeping the child engaged during the trip. Our storyboard steps through how the animatronic teddy bear will interact with the kid by various method as pointing to points of interest, projecting video and spotlights onto external surfaces, and having conversations.

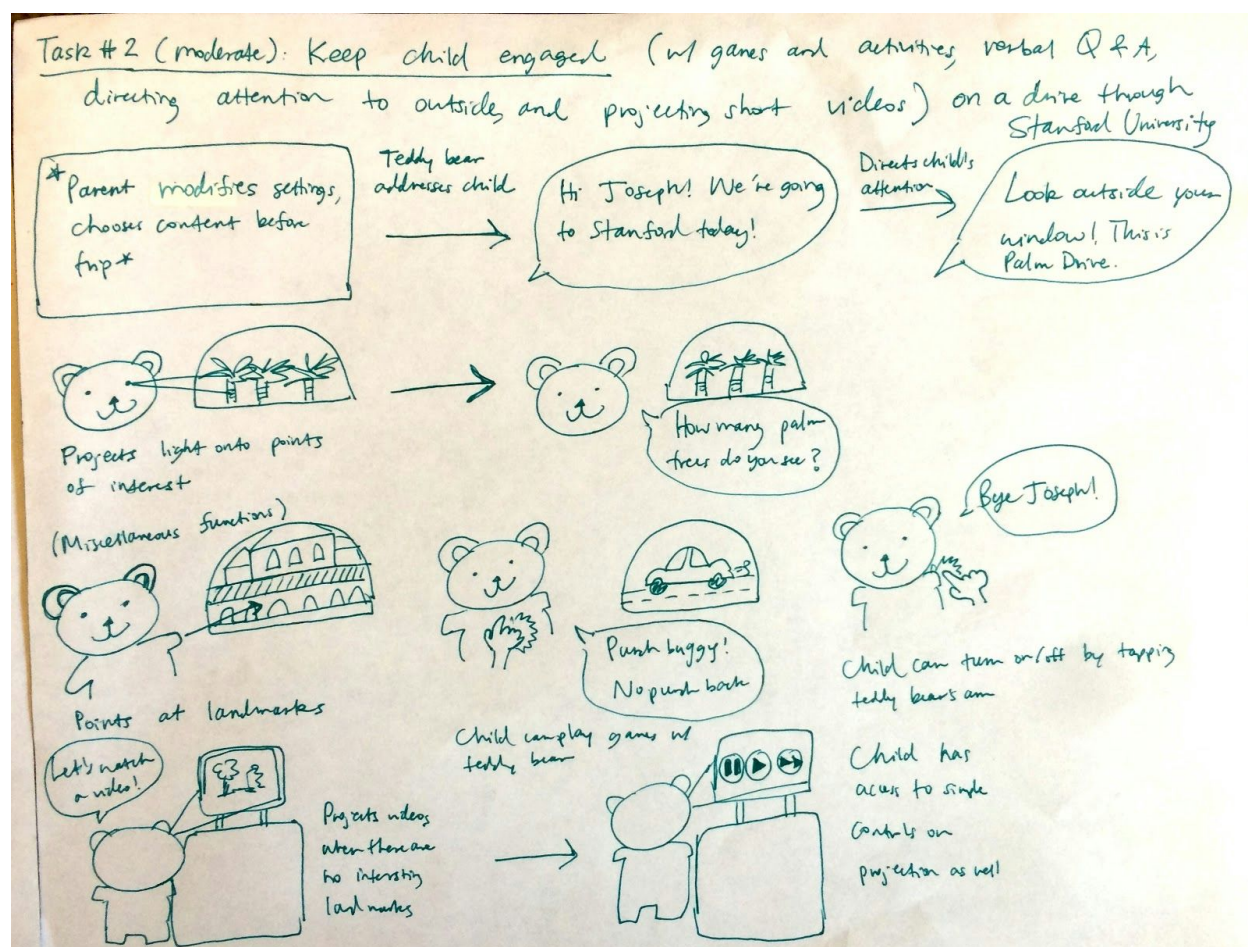


Fig 5: Moderate task storyboard

Hard: Creating and regulating content. The storyboard takes the parent through creating their own content with multimedia input, as well as how they rate content.

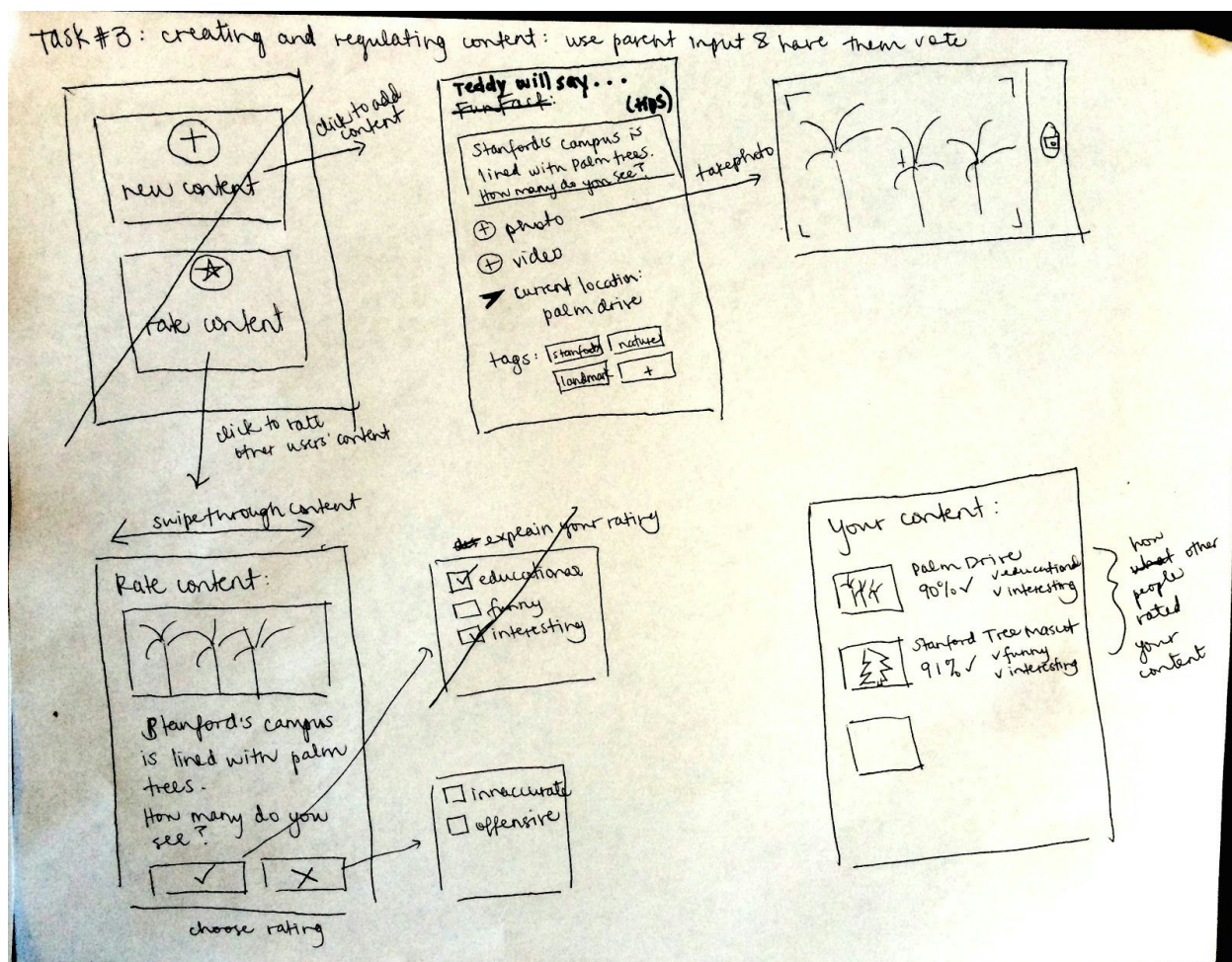


Fig 6: Hard task storyboard

Due to the limitations of current AI technology, we decided that for our prototyping we wanted to focus on the mobile app interface for the parent. Furthermore, we realized that the “Hard” task of creating and regulating content was complex enough to split into two parts. Thus we decided to implement prototype functionality for the following modified set of tasks:

1. **Task 1:** Preparing content for a new upcoming trip.
2. **Task 2:** Rate the content of a past trip.
3. **Task 3:** Create new content for future trips.

Functionality Specifications

Function	Specification
Create a new trip	The user can create a new trip, inputting their starting point and destination. They will be given a pool of content specific to the route they are taking, i.e. points of interest along the way from Stanford to San Francisco. They select their desired

	content from this pool, fulfilling a minimum quota based on the length of the trip. After selecting content, the user can review their trip in map form. Finally, they have the option of saving the trip for later or starting the trip immediately, which will activate the animatronic teddy bear for their kid to interact with.
View and rate past trips	The user can view and rate past trips. They can scroll through a list of trips they taken in the past, with the option of reusing content from them or rating each content they saw on the trip. They can also report a problem for a piece of content if they found it incorrect or inappropriate.
Create new content	The user can create their own new content based on something interesting that they want their child to see in future trips. The user can add a title, message, and photos or videos. The user also specifies where the content should be activated, and how wide of a radius it is visible. All content is publicly visible for other users to see.
Change settings	The user can customize their settings including their kid's name, age, preferred types of content, preferred minimum quota of content per length of trip, etc.

Prototype Description



In our prototype, the user interacts with a mock touchscreen interface via tapping, swiping, and pinching. To begin, the home screen gives access to all functions via four buttons: **Let's Go** (create new trip), **Wrench** (change settings), **Scrapbook** (view and rate past trips), and **Pencil** (create new content).

To perform our first task of preparing content for a new trip, the user taps Let's Go to be taken to a menu of My Trips. Here the user can add a new trip, specify starting location and destination, and then “pack” content from a pool of available crowdsourced content based on their route. For example, if the user was traveling from Stanford to San Francisco, their task flow would look as follows:

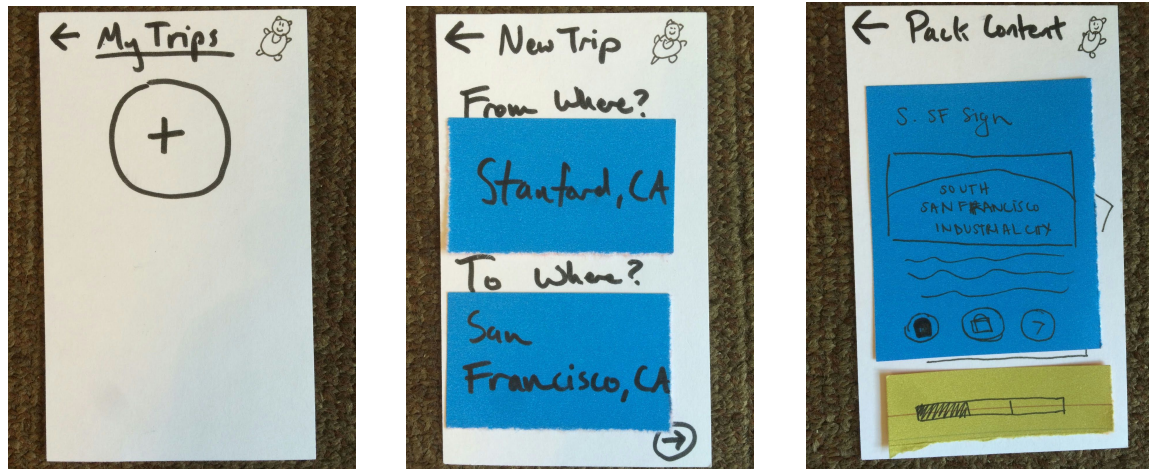


Fig 7: Home screen and screens to create a new trip.

Next, after the trip is over, the user is taken back to home screen where they can view and rate their trip by clicking on the Scrapbook. Here they will see an automatically-populated list of past trips. To perform their second task of rating the content of their trip from Stanford to San Francisco, they would click on the corresponding button and rate each piece of content based on how much they liked it or not:

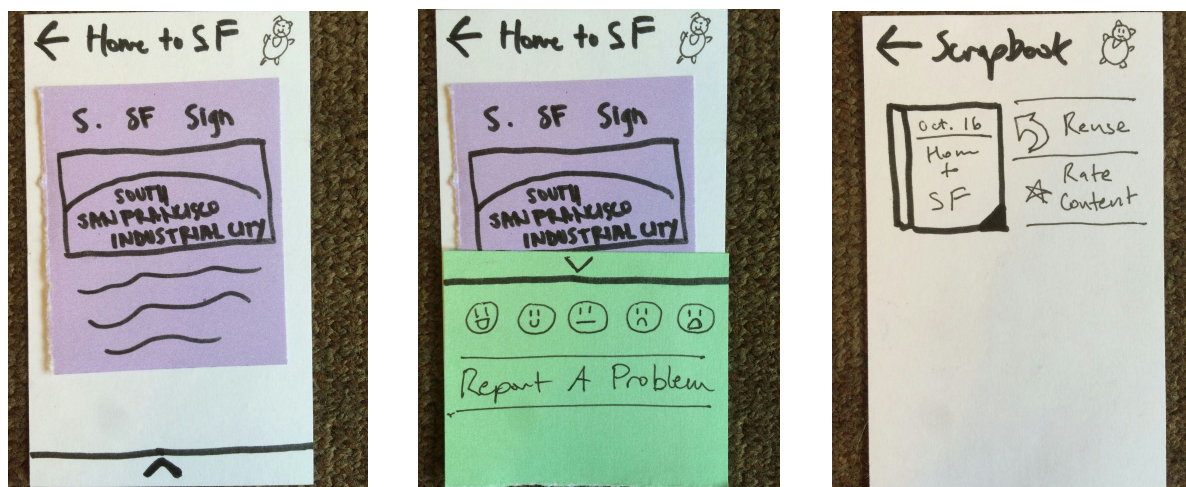


Fig 8: Screens to rate a past trip.

Finally, if the user wishes to create a new piece of content that they thought was interesting on the trip, say of Memorial Church, they can return to the home screen click on the Pencil to be taken to the create content section. Here they can specify what they want the teddy bear to say, as well as add photos and videos and define the location and radius of the attraction. The radius will determine how close you have to be to the location for the content to appear in your selection pool.

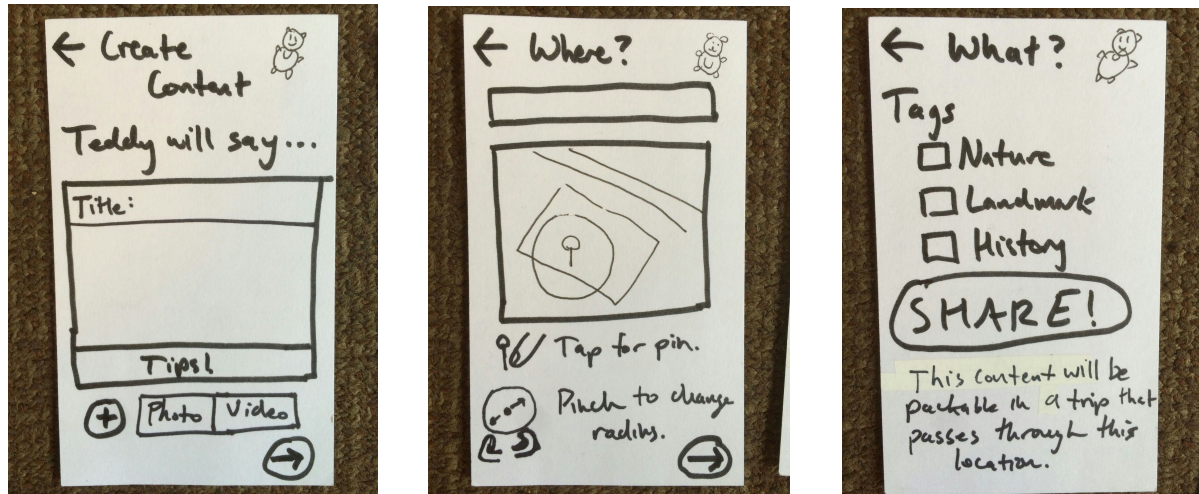


Fig 9: Screens to create new content.

Prototype Overview

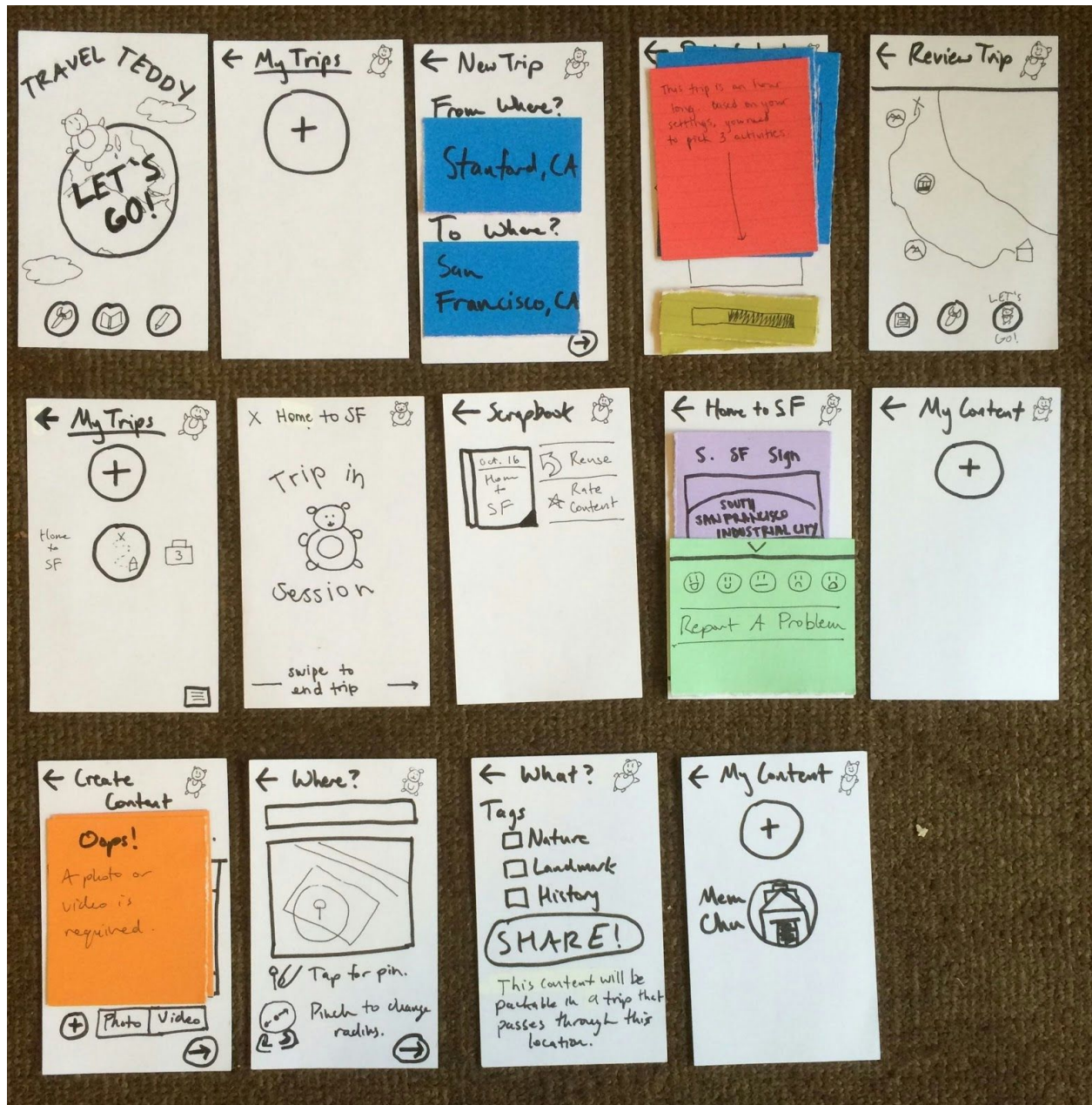


Fig 10: Overview of prototype screens.

Method

Describe the participants in the experiment, how they were selected, and any compensation they received. Also describe the testing environment and how the prototype and any other equipment were set up. Include images. Describe some details of your testing procedure. This should include the experimental roles of each member of the team. To prepare for the experiment, you should assign team members to the different tasks (i.e., computer, facilitator, etc.) and practice with someone playing the participant. The test measures detail what you looked for or measured during

the experiment. You should concentrate on process data (i.e., what is happening in the big picture) in addition to bottom-line data (i.e., time or # of errors).

Participants & Environment

Since we were mainly testing usability over content, we decided to draw our participants from a wider demographic of anyone who was 18 and older. We recruited participants by offering them boba in exchange for their time. The testing took place on the floor, in a student common living area. We tested the prototype by placing one card at a time on the floor, and transitioning based on which “button” the user tapped on. Member roles were divided as follows:

- Carla: mobile app
- Joseph: facilitator
- Karen: videographer and notetaker

Procedure

Participants were introduced to our project and told that we were creating an app for parents to make traveling with kids easier. They were told that the app provides crowdsourced content to entertain and educate kids, with the option to add your own. They were also told that the app aimed to direct kids’ attention to the environment outside the car, addressing the concern that most parents are hesitant about letting their kid use too much technology.

During each experiment, the facilitator asked the participant to perform each task without giving specific directions. Participants were allowed to clarify a task or ask what a particular icon was, but were not allowed to know what an icon did. They were encouraged to say their thinking process aloud as they transitioned through each screen.

Test Measures

We measured the test in terms of time (how long did it take a participant to complete a task?), observing the positive and negative reactions of each participant based on their words and actions (we filmed each participant), and by their own responses to a short survey that we asked at the end:

1. *What was most confusing or awkward part about this interface?*
2. *What went well? What parts were easy to understand?*

In addition, although this was not part of our three tasks, at the very end, we asked participants to describe what they would do to accomplish a fourth task:

3. *If you wanted to take another trip from Stanford to SF, what would you go to make another trip?*

Results & Discussion

See Appendix A for raw data.

Task 1: Make a new trip from Stanford to San Francisco and “pack” content.

Task 2: Rate the content of the trip you just took.

Task 3: Create new content for future trips: add an entry for Memorial Church.

All participants took the longest to complete Task 1, and completed Tasks 2 and 3 in relatively shorter amounts of time. Participants 1 and 2 in particular found Task 1 difficult because they didn’t realize Let’s Go was a clickable button, mistaking instead the Pencil icon for creating a new trip. Since this was on paper and the buttons were not skeuomorphic, we could make it more obviously a button in the final app; however, the Pencil icon was ambiguous and should be changed to something else in our next iteration. They didn’t know Let’s Go was a button because it’s meant to be like a physical circular button.

Participants also found the Trash can icon to be very ambiguous. For example, Participant 3 actively voiced confusion on whether it deleted the activity entirely, or just didn’t add it to their suitcase. We agree that the Trash, Suitcase, and Arrow button in the Pack Content screen should be rethought and possibly remade.

Next, the trips screen and content screen may have been too similar. For example, Participant 1 initially thought they were the same screen. We may need a different design paradigm for each, such as by making them different colors, or encoding trips as circles and content as squares.

Finally, we realized that participants didn’t pay attention to the text under the Share content button which explained that the created content would be visible to the entire world. We think adding a confirm screen before adding text would force users to pay more attention to it.

Some factors our experiment did not explore was the interface interaction of the child with the teddy bear, and is something we may want to incorporate into our medium-fidelity prototype. However, we were able to gain a lot of useful insights for our mobile app interface that did not occur to us at all in the prototype ideation process.

Appendix A: Raw Data

Participant times to complete tasks

#	Task 1	Task 2	Task 3	Total
1	5:52	1:40	1:05	8:37

2	7:05	1:21	1:40	10:06
3	3:30	0:50	2:40	7:00

Observations of participants

#	Positive reactions	Negative reactions
1	<ul style="list-style-type: none"> ● Once they clicked on Let's Go, they found the interface to be relatively self-explanatory: "Oh, <i>that's</i> it!" ● Found the Luggage icon intuitive: "I expect it to be like, yeah, put it in the bag." ● Had right intuition for Scrapbook: "I expect it to be a search history of past trips." ● Liked the rating system: "Oh my god, that's so cute! It's like, really happy, then mortified." ● Making content went smoothly because they were already familiar with it: "I know this, guys!" ● Had right intuition for changing the radius of a location: "I want more people to see it, like, you can see it from that street, let me make it bigger." 	<ul style="list-style-type: none"> ● Did not realize Let's Go was a button; misinterpreted Pencil as creating a trip rather than create new content ● "Is there already content? How are we going to find this content?" ● Thought the Wrench icon was an airplane. ● Was confused by My Trips and My Content screens; mistook them for the same screen since they look similar ● Tried tapping Let's Go and Pencil before tapping Scrapbook to rate content.
2	<ul style="list-style-type: none"> ● On Scrapbook icon: "I wonder if this is to view past records or whatever...I feel like it's some sort of list." ● On reaching New Trip screen after wrong first attempt: "Oh, okay." ● On rating each piece of content on a trip one-by-one: "Oh, I see. Different content." ● On creating content task: "I know what to do. Oh, that makes sense." They said this because they had already accidentally visited the Create Content screen before. ● On radius: "The content pops up within this radius." 	<ul style="list-style-type: none"> ● On Pencil icon: "I wonder if this is edit or new to make a new trip." ● Also didn't realize Let's Go was a button, clicked on Pencil first: "That was a confusing design flaw. I mean, it'll depend on the color [in the final app]." ● Misinterpreted My Content screen as the correct screen to add new trips to.

3	<ul style="list-style-type: none"> ● Clicked Let's Go immediately to create a new trip: "I would assume you click here?" Commented that this was intuitive for them because they usually play games where "Let's Go means go." ● On Trash icon: "I'm guessing the trash can is like, you don't want this." ● After a first wrong attempt, found right intuition for Suitcase: "It makes the activity, like, go in." 	<ul style="list-style-type: none"> ● Found Suitcase icon to be "really hard" to understand. Pressed arrow button instead to add content to trip: "Dang it. That didn't work." ● On Trash icon: "But I don't know what this one is doing. Are you going to delete the whole activity? Or just not get it?" ● Found the purpose of the radius to be confusing, although they understood it was meant to change the relative size of a landmark." ● On text below Share Content: "I didn't even read it."
---	--	--

Survey responses

#	Question 1 response	Question 2 response	Question 3 response
1	<p>"I didn't know Let's Go was a button, I thought it was a pencil was to draw a new route."</p> <p>"I thought the wrench was a plane."</p>	"It's easy to get once you get it."	"I would go back to the main screen and hit Let's Go again. And expect to see my new content as an option that I can switch with content from my original trip."
2	"The main screen was confusing. Some of the drawings weren't clear."	N/A	"When you're choosing different contents. I would click on Let's Go from the home screen."
3	<p>"I had no idea what radius was." (but they eventually got it)</p> <p>"I didn't understand the three buttons on the Pack Content screen. It would be more understandable if the luggage was a 'check'."</p>	"The Let's Go part was really easy."	"I would click on Let's Go."

Other notes

- Participant 2 gave additional feedback:

- Should be able to add comments when rating stuff, and be able to add content, edit, etc.
- Grid or list view of content options might be better since one-by-one swiping could be tiring.
- Content rating: might be helpful to have like/upvote and comments for parents to see that 30 people liked it. Show upvotes in your own content section.
- They wondered what the incentive was for parents to add content.
- None of the participants realized the teddy bear in the top right corner of all screens could take them back to the home screen. All participants just repeatedly clicked the back button to go to the home screen.
- Since we were focusing on usability testing rather than content, we made some contrived examples for content participants could add to the trip. However, we didn't realize the quality of the content was so important to all participants, as they each mentioned that some of the fake examples (trees, a reservoir, and the South San Francisco hill sign) seemed boring and in a real product they would expect to see more interesting content.
- Participants were curious what the Report a Problem button did, and clicked on it.

Appendix B: Consent Forms

Consent Form

The "Travel Teddy" application is being produced as part of the coursework for Computer Science course CS 147 at Stanford University. Participants in experimental evaluation of the application provide data that is used to evaluate and modify the interface of "Travel Teddy". Data will 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 Joseph P., Carla R., and Karen W. or with Professor James Landay, the instructor of CS 147:

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

Participant anonymity will be provided 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 experiment and my participation in it. I give my consent to have data collected on my behavior and opinions in relation to the "Travel Teddy" experiment. I also give permission for images/video of me using the application to be used in presentations or publications as long as I am not personally identifiable in the images/video. I understand I may withdraw my permission at any time

Name Yamin Phyu

Participant Number 3

Date 22/10/15

Signature [Signature]

Witness name Koko

Witness signature [Signature]

Consent Form

The "Travel Teddy" application is being produced as part of the coursework for Computer Science course CS 147 at Stanford University. Participants in experimental evaluation of the application provide data that is used to evaluate and modify the interface of "Travel Teddy". Data will 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 Joseph P., Carla R., and Karen W. or with Professor James Landay, the instructor of CS 147:

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

Participant anonymity will be provided 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 experiment and my participation in it. I give my consent to have data collected on my behavior and opinions in relation to the "Travel Teddy" experiment. I also give permission for images/video of me using the application to be used in presentations or publications as long as I am not personally identifiable in the images/video. I understand I may withdraw my permission at any time

Name Jihee Hwang

Participant Number 2

Date 10/12/2015

Signature [Signature]

Witness name Colo

Witness signature Colo*

Consent Form

The "Travel Teddy" application is being produced as part of the coursework for Computer Science course CS 147 at Stanford University. Participants in experimental evaluation of the application provide data that is used to evaluate and modify the interface of "Travel Teddy". Data will 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 Joseph P., Carla R., and Karen W. or with Professor James Landay, the instructor of CS 147:

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

Participant anonymity will be provided 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 experiment and my participation in it. I give my consent to have data collected on my behavior and opinions in relation to the "Travel Teddy" experiment. I also give permission for images/video of me using the application to be used in presentations or publications as long as I am not personally identifiable in the images/video. I understand I may withdraw my permission at any time

Name Gregory Taylor

Participant Number 1

Date 10/22/15

Signature [Signature]

Witness name Jojo

Witness signature [Signature]