

# LoFi Prototypes

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## Introduction

Mission Statement: We're on a quest to make travel easy and spontaneous every step of the way

Value Proposition: Personalized Adventure On-Demand

Problem: When traveling, people have difficulty finding specific activities or next steps based on their interests and goals, while maintaining itineraries that enable spontaneity

Solution: We aim to provide hyperlocal, personalized, and real-time recommendations to guide people through open-ended travel situations

## Sketches

### Overview

We explored five different **ideas** with various input and output modalities (e.g wearable, AR).

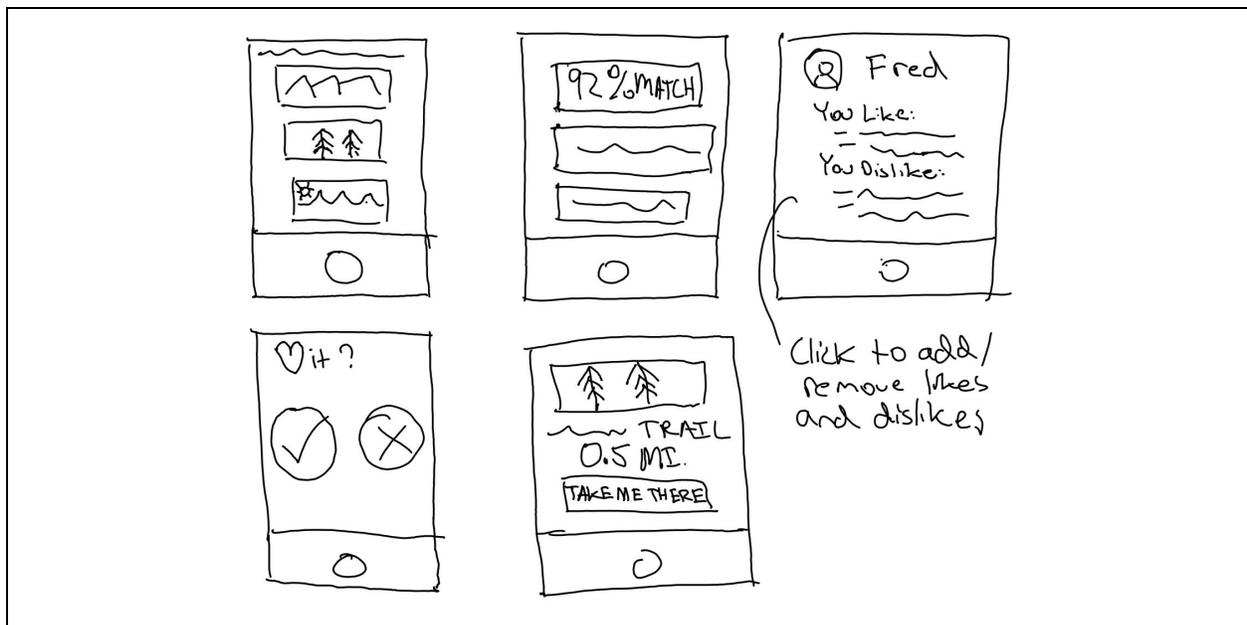


Fig. 1: Mobile app providing a limited (e.g. three) number of personalized activity options for the next-best action

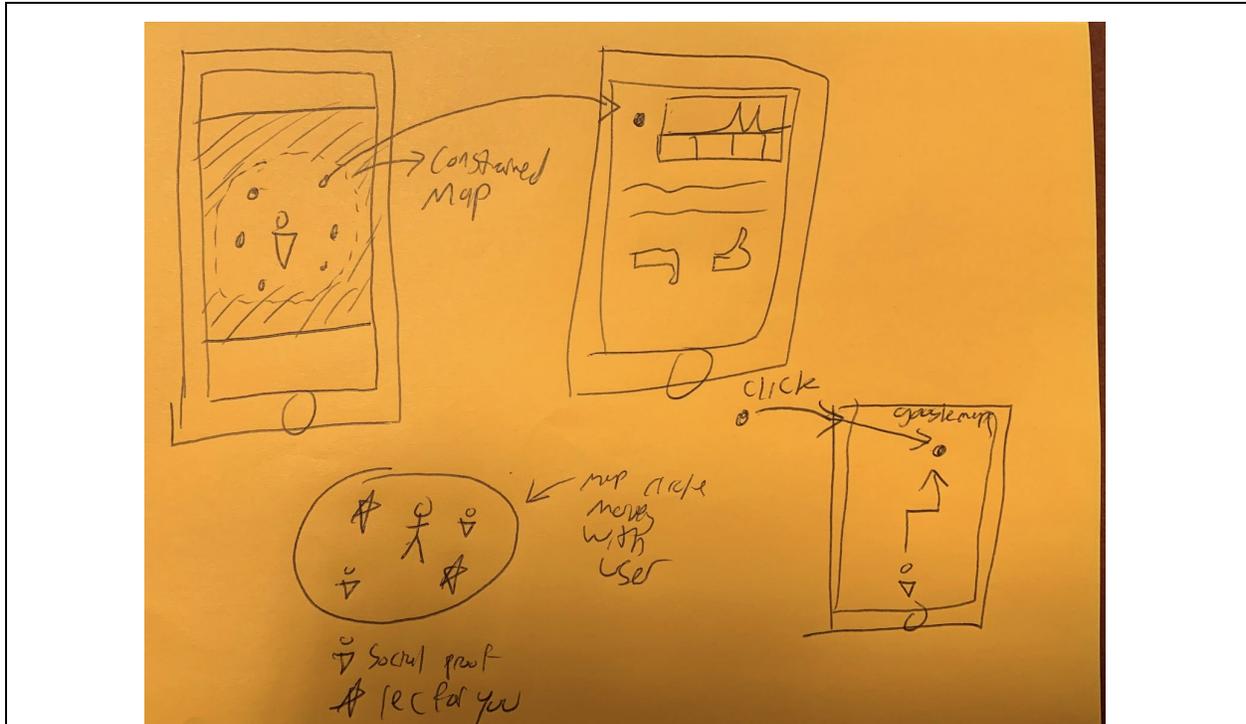


Fig. 2: Mobile app that provides next-best recommendations overlaid on a map with constrained radius

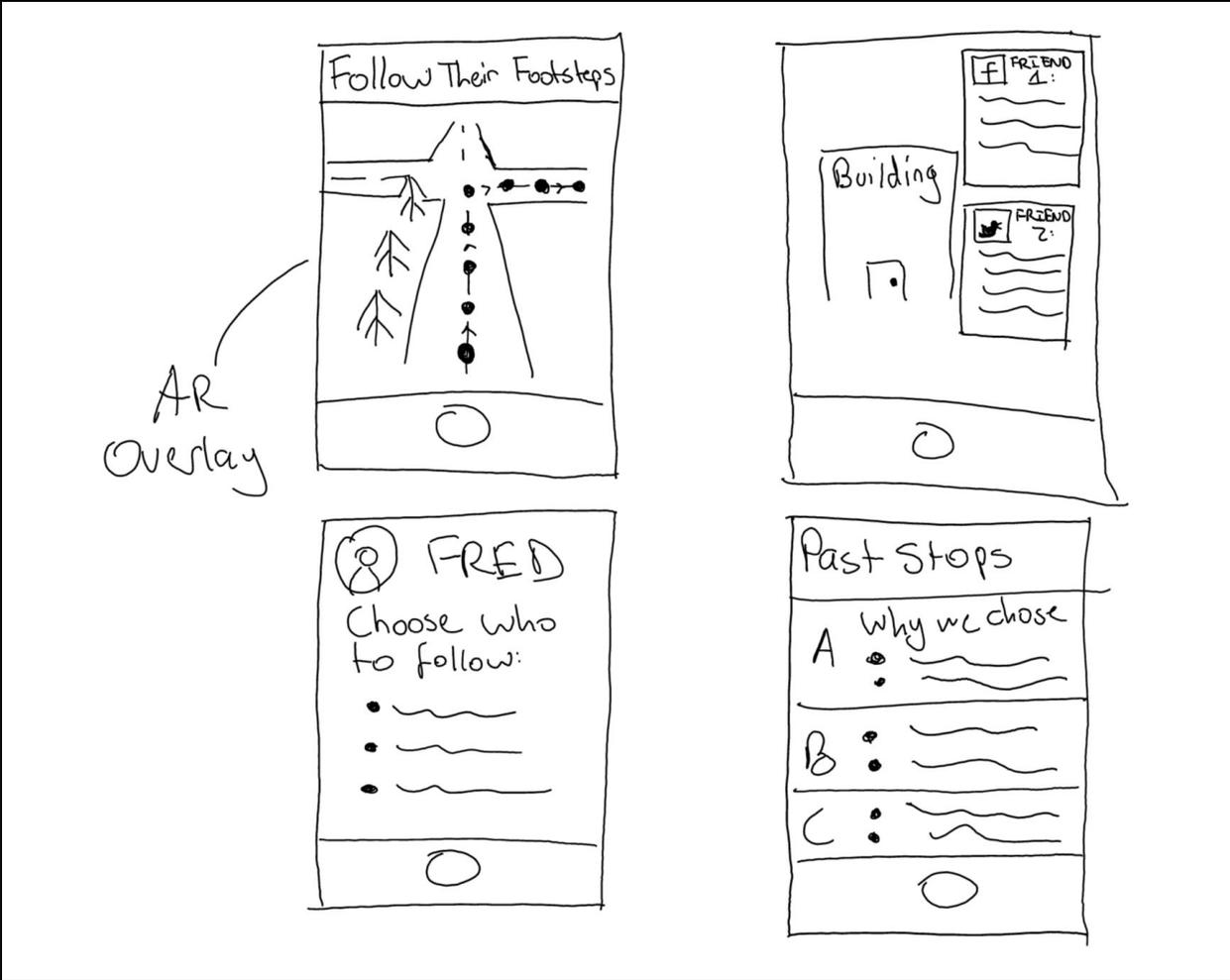


Fig. 3: Mobile AR app allowing you to follow your friends' "footsteps" and surfaces friends' travel recommendations on social media

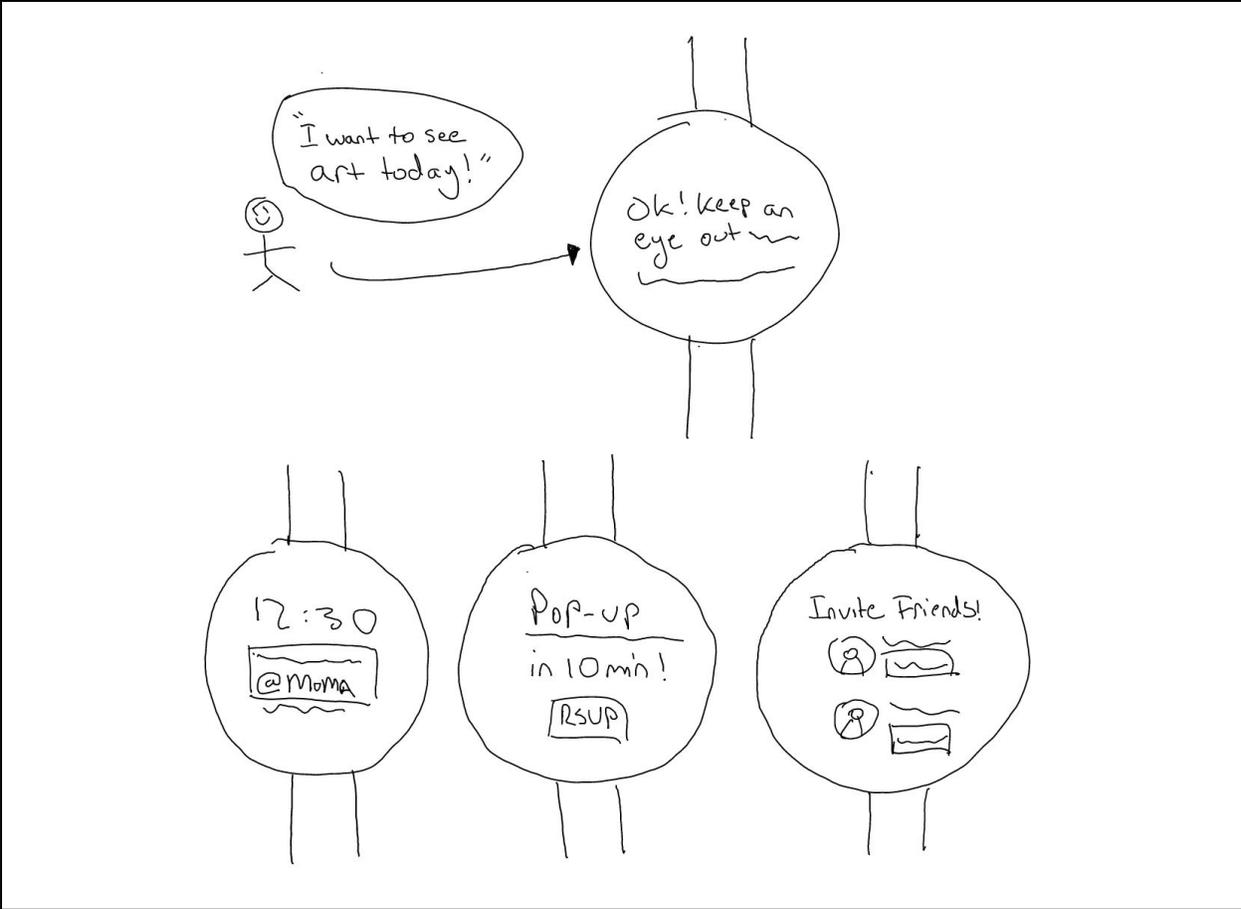


Fig. 4: Wearable (watch) app surfacing ad-hoc, local pop-up experiences with user voice input



Fig. 5: Wearable (glasses) app overlaying video stories from friends on local points-of-interest

## Storyboard

From discussion, we decided that the two most interesting realizations of our solution were idea 1 and idea 5, and storyboarded these two ideas below:

**Idea 1:**

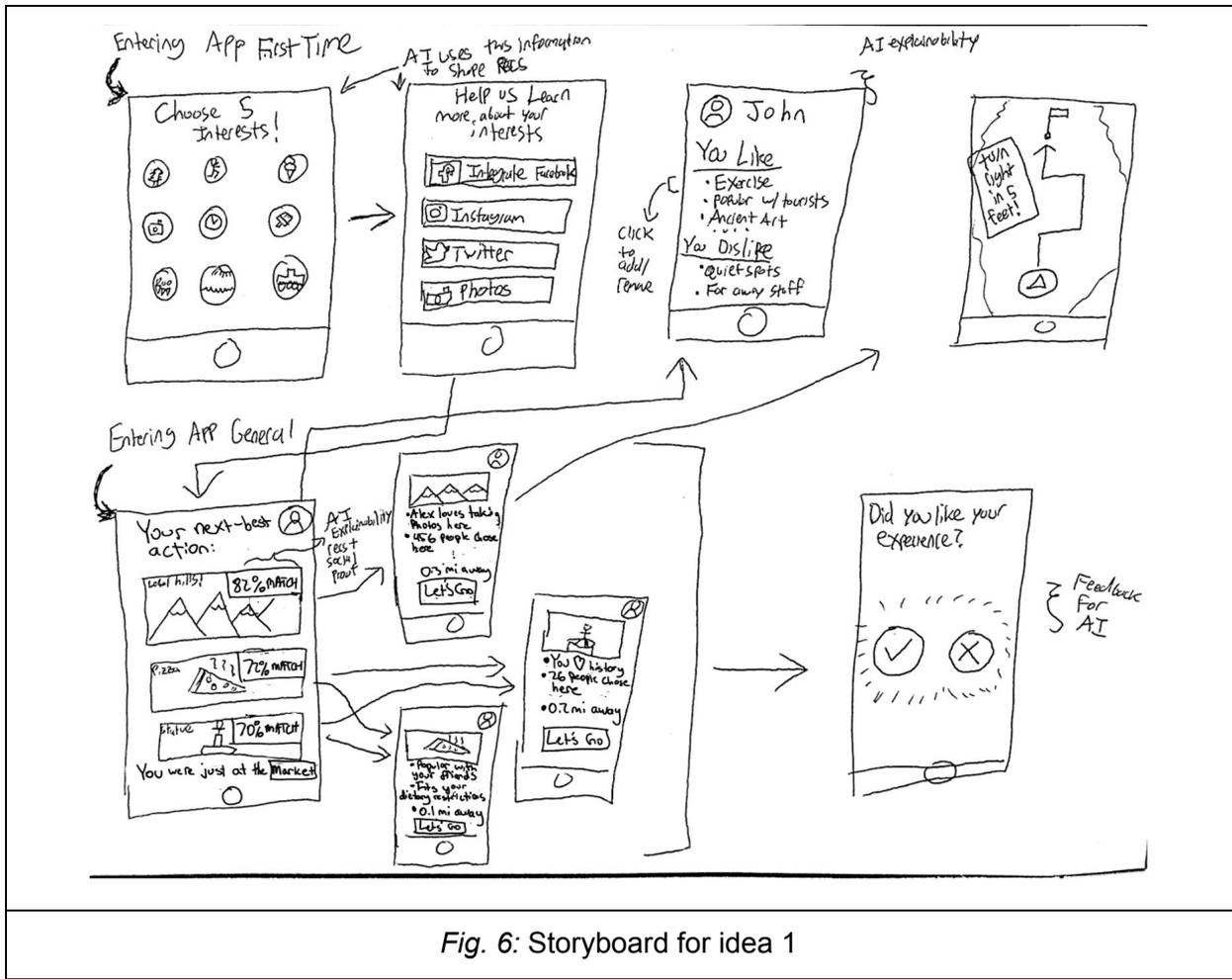


Fig. 6: Storyboard for idea 1

Idea 2:

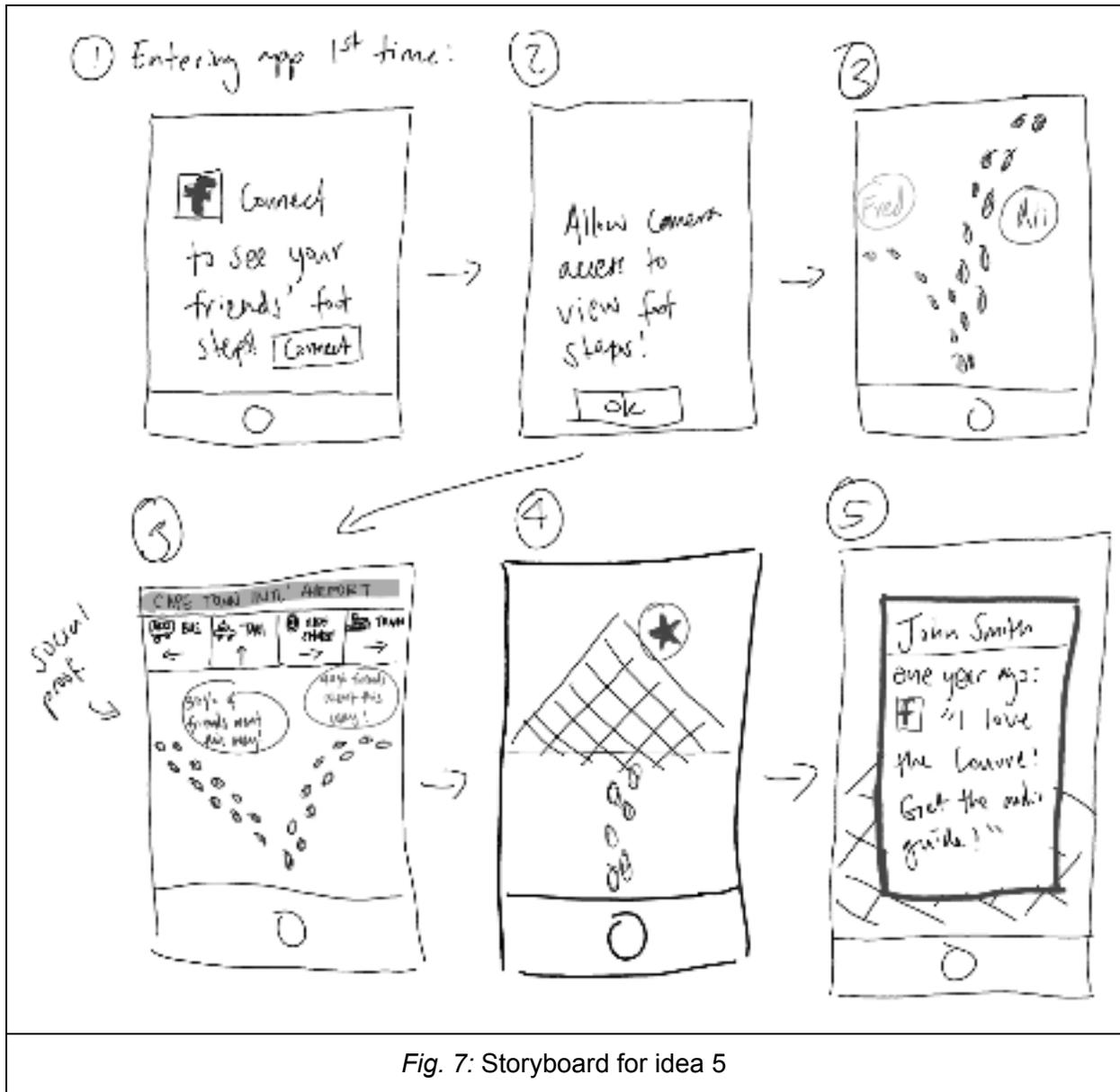


Fig. 7: Storyboard for idea 5

## IDEA SELECTION

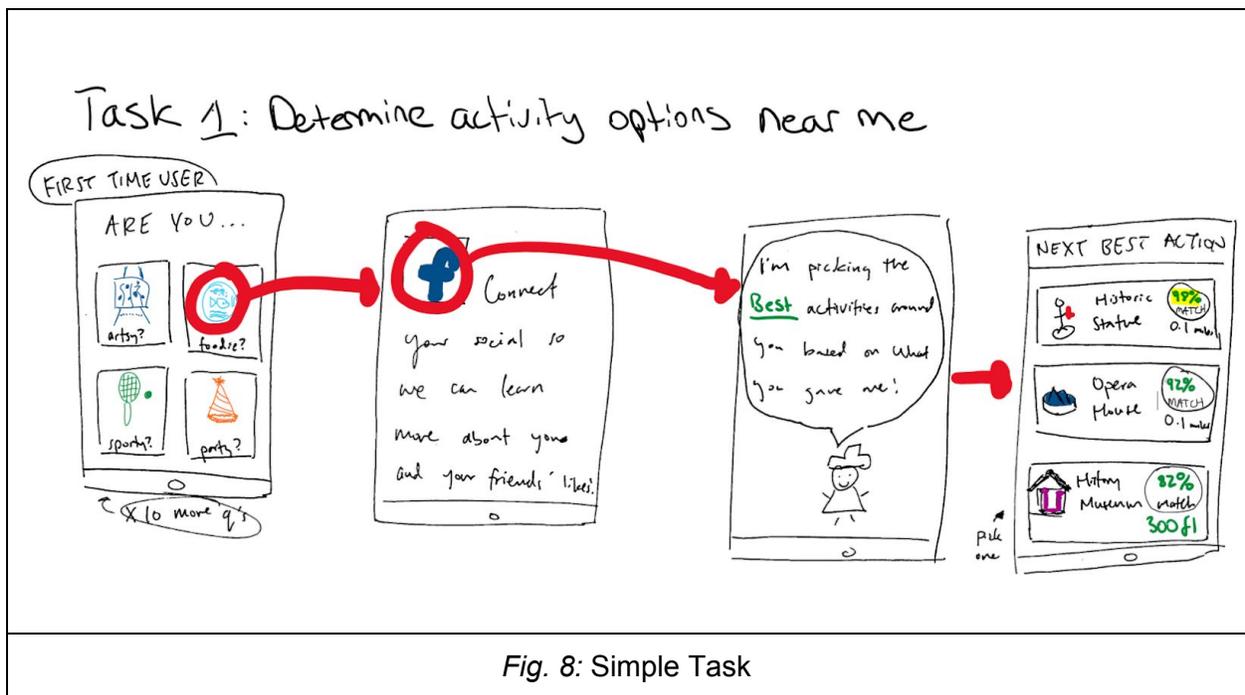
To evaluate each idea, we drew out a list of pros and cons:

	Pros	Cons
Limited Personalized Options	<ul style="list-style-type: none"> <li>• Simple, user-friendly UI</li> <li>• Successful prior design patterns</li> </ul>	<ul style="list-style-type: none"> <li>• Limited options not ideal for users who want all information</li> </ul>

	<ul style="list-style-type: none"> <li>• Easy to implement</li> <li>• Quick on-boarding</li> <li>• Reduces decision-making anxiety</li> </ul>	<ul style="list-style-type: none"> <li>• Simple UI might obfuscate explainability</li> <li>• Utilizing social media and data can be frustrating for users</li> </ul>
AR Footstep App	<ul style="list-style-type: none"> <li>• Novel interaction modality</li> <li>• Fully immersive experience</li> <li>• Leverages social media snippets -&gt; may feel more personal</li> <li>• AI explainability is easier to implement here</li> </ul>	<ul style="list-style-type: none"> <li>• More technical and not necessarily feasible</li> <li>• More decisions = possible decision anxiety</li> <li>• Data privacy concerns</li> <li>• Network effect - must reach a certain number of "paths" submitted before it becomes fully effective</li> </ul>

We selected the first idea of limited personalized options. A discussion with Prof. Landay helped illuminate that novelty does not necessarily equal value and furthermore, the AR solution was significantly more technically challenging. We felt that our first idea, while simpler, could more cohesively solve our user needs if we focused carefully on AI explainability and nuanced personalization.

## Task Flows



## Task 2: Learn and use what others have done before

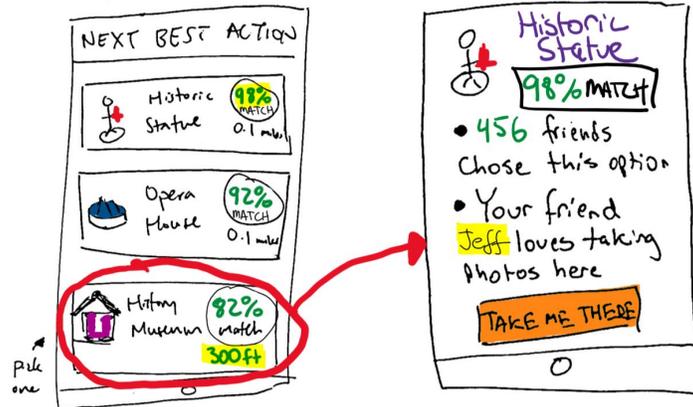


Fig. 9: Simple Task

## Task 3: Choose the next-best personalized travel option Task 3a: Give the system feedback on the activity

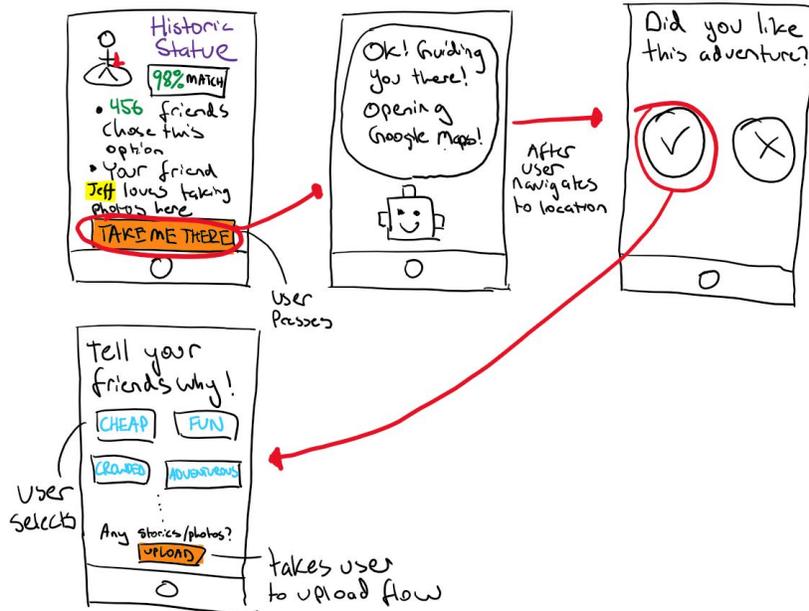


Fig. 10: Complex Task

Task 3b: Surface more relevant activity options if dissatisfied with the initial offering



Fig. 11: Complex Task

# Paper Prototype

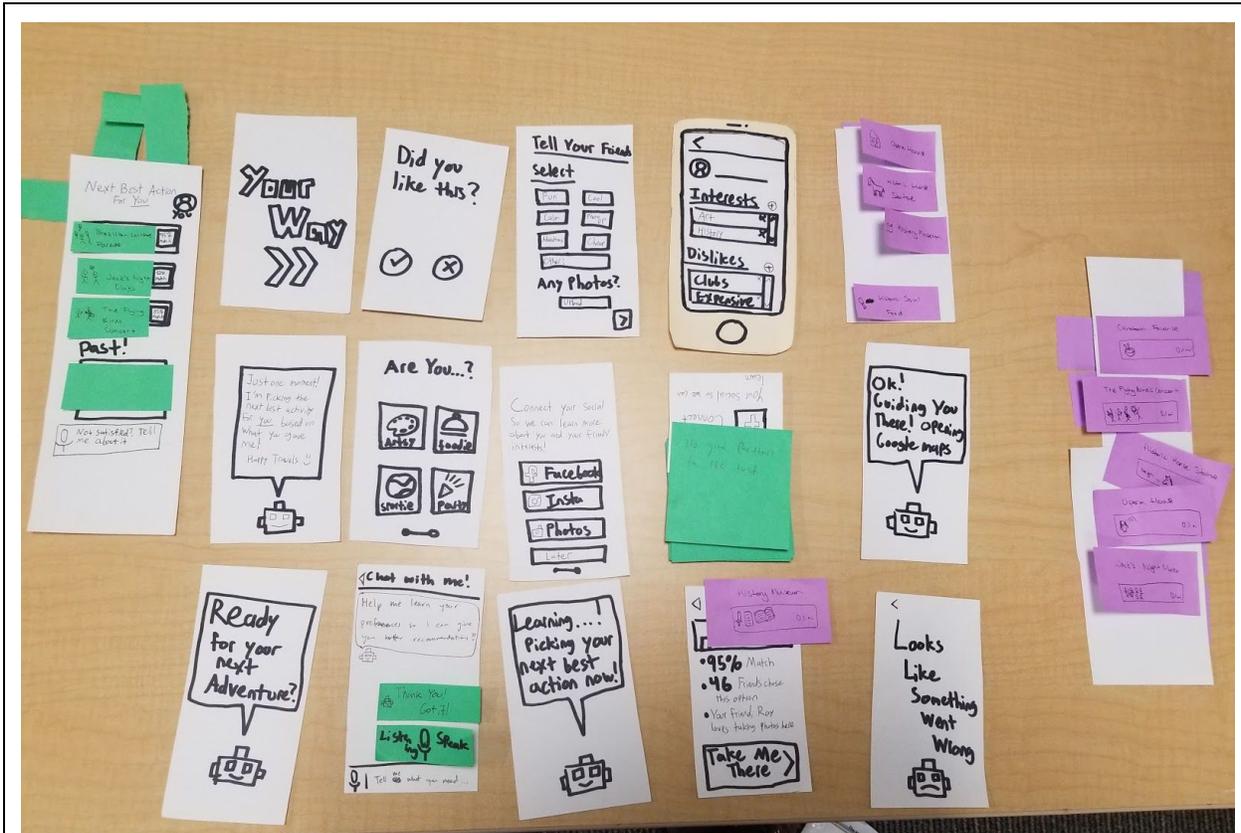
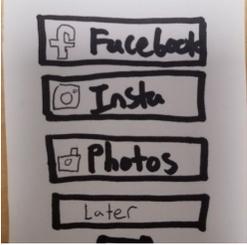
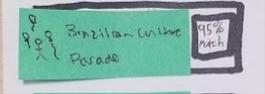
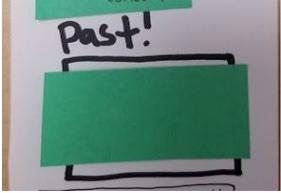
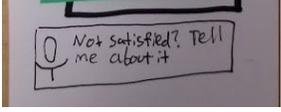
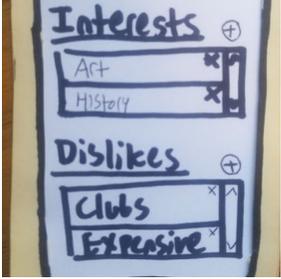
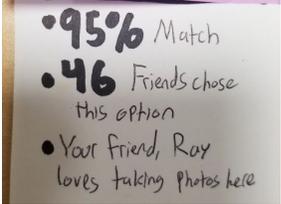
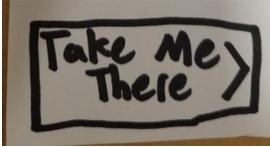
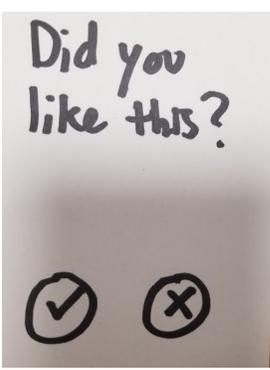
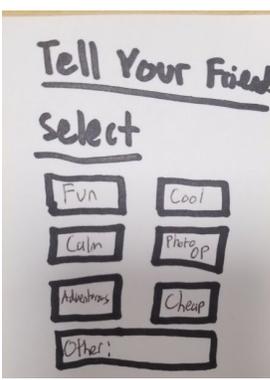
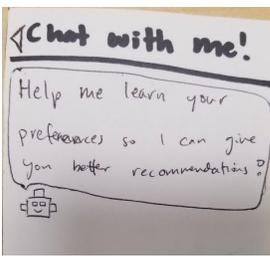
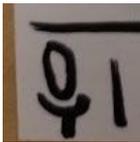


Fig. 12: Paper prototype overview

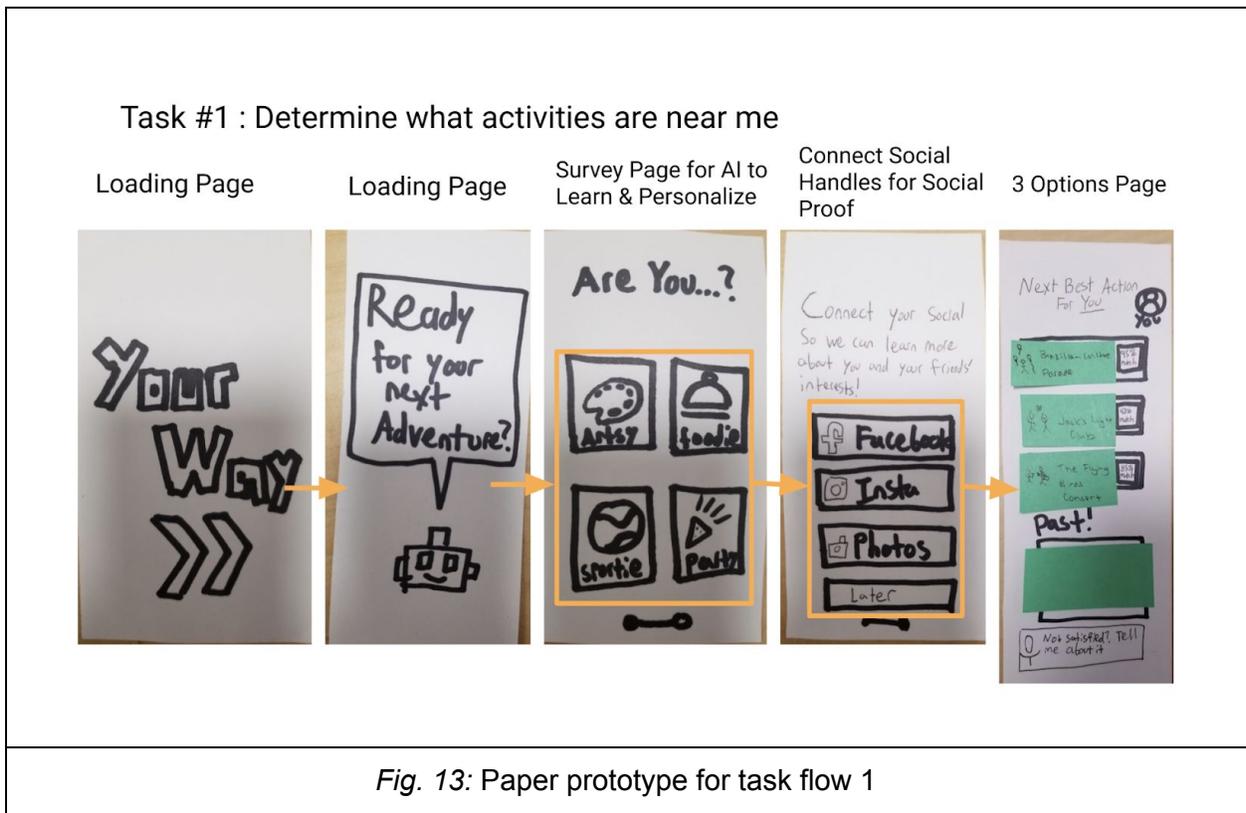
After sketching the task flows, our next step was to design the low fidelity paper prototype. Below we list out the key features and their functionality:

Picture	Feature Name	Functionality
	Intro Pref Survey	Button survey to gather high-level user preference information

	Intro Social Integration	Integrating social media for added personalization
	Profile Button	Sends user to profile page containing AI learned information about user preferences
	Activity Option	A next best action activity that is matched to that user based on personalization
	Past Actions	Past activities the user has taken to help them contextualize why these current matches are their next best action
	Updating Preferences	If the user is unsatisfied, they can communicate with a chatbot to help the AI learn about their preferences
	Update Interests	Users can manually input specific interests or dislikes if they know what they want
	Social Proof Info	User is presented with social proof (what their friends have done before) to help contextualize their next action

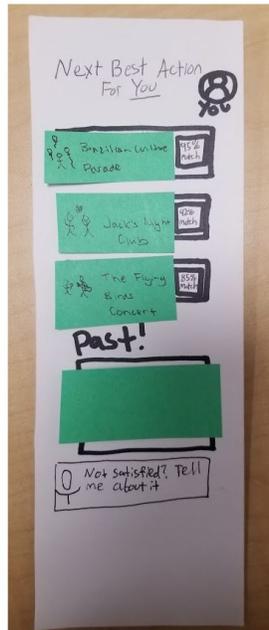
	<p>Let's Go!</p>	<p>User clicks this button to embark on an activity</p>
	<p>Approval Feedback</p>	<p>User provides feedback to AI about the match</p>
	<p>Nuanced Feedback Submission</p>	<p>User provides additional optional feedback to help other friends in the future</p>
	<p>Photo Upload</p>	<p>Users can upload photos that the AI can use to learn more</p>
	<p>Chatbot Responses</p>	<p>AI chatbot interacts with the user as a feedback mechanism when the user wants to express dissatisfaction on their matches</p>
	<p>Voice Communication</p>	<p>User can use Voice Input to communicate with chatbot</p>

	<p>Chatbot Typing Communication</p>	<p>User can type to communicate with chatbot</p>
	<p>AI Progress Updates</p>	<p>AI placeholder with varied responses based on where the user is in the task flow pipeline to make AI feel less like a black box</p>



Task #2: Figure out what your friends have done before

3 Options Screen



Specific Option Screen with Social Proof

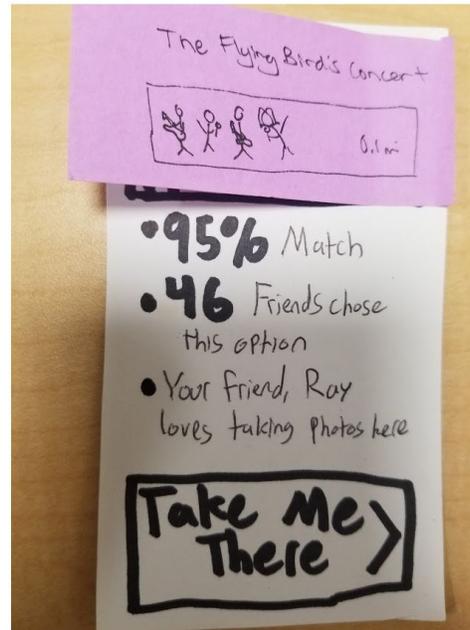
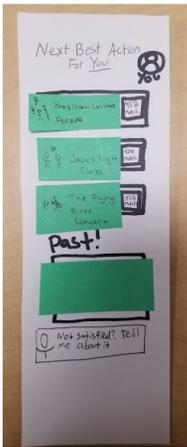


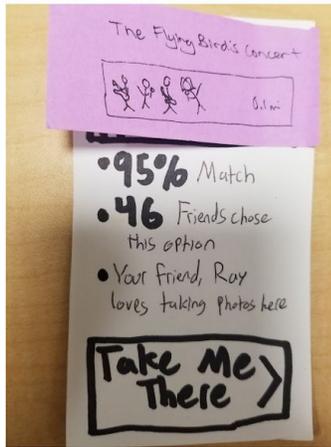
Fig. 14: Paper prototype for task flow 2

Task #3a: Choose an option and evaluate it

3 Options Screen



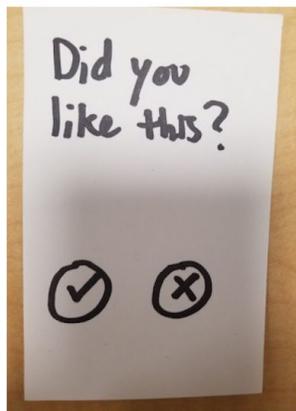
Specific Option Screen with Social Proof



Loading Screen, Switches to Google Maps Route



Feedback on Activity



Social Feedback for Friends and AI

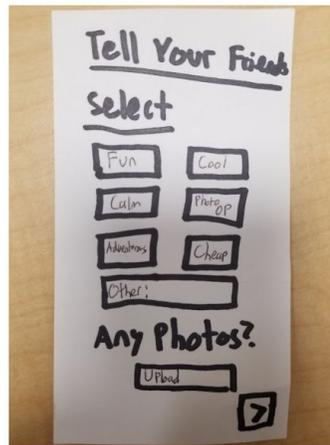


Fig. 15: Paper prototype for task flow 3a

## Task #3b: Inform app that you don't like the options

3 Options Page

Chatbot (with Post-It Responses)

Loading Page for 3 Updated Options

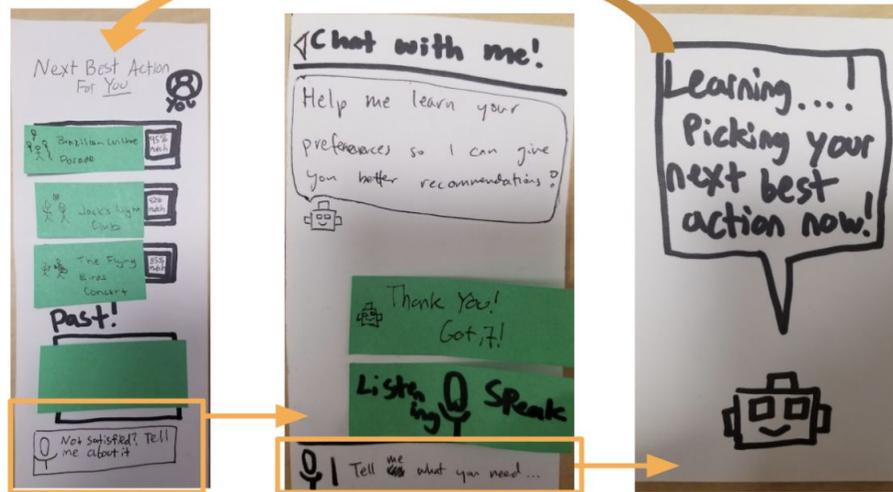


Fig. 16: Paper prototype for task flow 3b

## Method

### Participants

We found 2 Stanford students and 3 non-Stanford students. After our first prototype test, we realized that we needed to carefully screen for users who fit our target demographic using questions like:

- Have you traveled recently in the last few years?
- When you travel, do you prefer to plan in advance or plan as you go?

The four following recruited participants were people who traveled at least once in the last year and enjoyed spontaneity while traveling.

### Environment

We performed 1 test in downtown Palo Alto, 2 at the Nitery, and 2 at Tressider. All tests were performed in a quiet setting at a table where we placed our paper prototypes. We did not compensate any participants.

## Roles:

- Facilitator: Netta
- Computer: Ray
- Observers: Jeff / David

Our testing goals were to observe the participant's performance on the following tasks:

- Task 1 (Simple). Figure out what you can do nearby
  - Users needed to go through the first-time user screens and access the home screen to see their options
- Task 2 (Moderate). Figure out what your friends have done before
  - Users needed to click on an option and see social proof information
- Task 3a (Complex). Choose an activity option and evaluate it in the app
  - Users needed to select an activity and then give it feedback on conclusion
- Task 3b (Complex). Inform the app you don't like the activity options given to you
  - Users needed to go to the chatbot and communicate that they wanted updated preferences

Tasks 1 and 2 are based off of our tasks from the Storyboard assignment. Our third task about personalization contained two related sub-tasks: having a user receive personalized content by evaluating activities after completion and when unsatisfied with their options.

## Test Measures

When running our tests, we logged participants' statements, facial expressions, and how they interacted with the prototype. We noted whether actions were positive or negative, and whether they were critical incidents. We processed the data with the additional key details:

- Number of positive / negative critical incidents per participant
- Average severity ranking of critical incidents per participant

## Results + Discussion

### Summarized Data

- 4 out of 5 testers said that they liked the concept of the app and would use it when traveling. The 1 dissenter is not in our target group.
- All participants struggled with navigating the UI. 2 testers (P4 and P5) said they were "stuck" on the task #2 of figuring out what friends have done in the past.
- All users struggled with finding the entrypoint to the chatbot in task #3b, with P3 feeling "stuck" and P4 interpreting the chatbot button as in-app feedback.
- P4 happily noticed that he was navigating through the prototype like a real phone, which demonstrates that our current UX is on the right track.
- P2, P4 and P5 expressed positive sentiment towards the "serendipity" and hyperlocal aspects of the app, further validating our value proposition.

## Interpretation

Overall, we are satisfied with the results of our study. The average critical incident severity per user was 2.001, which suggests that we are a few usability changes away from a viable design. While users encountered many usability challenges, there was also a sufficient amount of positive critical incidents to suggest that we are on the right path. In particular, one user seemed pleased that their next best choices could be dynamically updated after communicating with the chatbot, which confirms the necessity for real-time personalization.

### **To change:**

We want to change the “survey” at the beginning of the application for a few reasons. First, we found that users thought it was constraining to pick an overarching identity (e.g. “artsy”). Still, gathering up-front information would be critical to making initial recommendations if this was a real application. Therefore, we want to reimagine this survey to be more user-intuitive and nuanced.

### **UI changes**

- Information about social proof was only revealed after clicking on each specific activity. Multiple testers were stuck on the home page when trying to fulfill task #2 of figuring out what one’s friends have done before. One tester suggested we show this information on the main page where the activities are presented, which we agree is most intuitive.
- The feedback option for activities was too binary. We’ll create more nuanced responses.
- Clarifying which are buttons and which are statements on social proof page.
- Two of our participants were against the idea of the app redirecting to Google Maps because of usability or privacy concerns. We will consider adding a map natively into our app.

## Open Questions

- What types of requests the AI chatbot can and cannot successfully fulfill?
- How do we further create transparency and explainability as the AI collects information?

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# APPENDIX

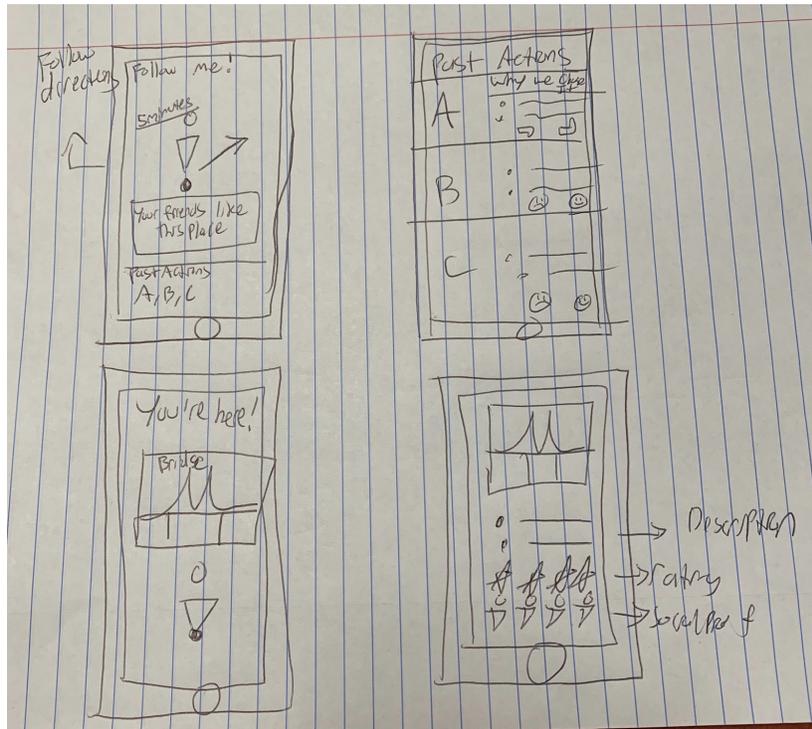


Fig. 17: Trust the AI and let it guide you each step of the way (an additional idea concept we came up with)

	P1	P2	P3	P4	P5
<b>Number of Critical Incidents</b>	6	8	8	16	13
<b>Average Severity</b>	2.833333333	1.125	2.125	2	1.923076923
<b>Number of Positive Critical Incidents</b>	0	4	2	4	3
<b>Number of Negative Critical Incidents</b>	6	4	6	12	10

Fig 18: Critical Incidents Log

P1	
Incident	Severity

Concerned at the limited number of activity options (Task 1)	4
Had trouble interpreting which option is closest (Task 1)	2
Confused by what the % match score meant (Task 2)	3
Confused by differing levels of specificity in options (Task 2)	2
Strongly disliked Yes/No feedback system (Task 3)	4
Wanted to change recommendation preferences depending on location (Task 1)	2

Fig 19: P1 Critical Incidents

P2	
Incident	Severity
Wanted to choose more than one personality option in onboarding (Task 1)	2
Noted that options looked very fun (Task 1)	0
Tried to click the social information description text as if they were graphics (Task 2)	3
Wanted to purchase tickets in-app but couldn't (Task 2)	3
Mentioned that app was very fun to use (Task 1)	0
Intuited app navigation very quickly (<5 seconds) (Tasks 1,2)	0
Wasn't able to determine where data was being pulled from (Task 2)	1
Positively noted the small distance to the recommended location (Task 2)	0

Fig 20: P2 Critical Incidents

P3	
Incident	Severity

Mistakenly navigated to his user profile to determine what his friends had done in the past (Task 2)	3
"Ohhh... cool" reaction after seeing demo of app (Pre-task)	0
"Is there a way to go back? I don't know..." while struggling to return back to the activity options page (Task 2)	3
Tried to click the social information description text as if they were graphics (Task 2)	3
Had significant trouble finding entrypoint to chatbot (Task 3)	4
Noted that more direction on how to physically interact with the app would be helpful (Tasks 1-3)	2
Positive reaction ("cool") when seeing chatbot screen (Task 3)	0
Didn't understand what the past box was (Task 3)	2

Fig 21: P3 Critical Incidents

P4	
Incident	Severity
Noted that he already had a general idea of what to do in mind and there was no way to input that (Task 1)	2
"These features seem intuitive, so I would scroll down to explore" (Task 1)	0
"I'm stumped" while trying to find what friends have done in the past (Task 2)	4
"Oh, I'm already using it like a real phone!" while navigating between screens (Task 1)	0
Was confused by how the phone knew what location he was currently in (Task 1)	2
Disliked having to click through all activity options to get an overview of what his friends have done (Task 2)	3
"Why are you opening up maps in a separate app?" (Task 3)	3

Wants to take photos through the app while at the destination or in-transit (Task 3)	2
Really liked being able to see his most recent options (Task 3)	0
Thought that chatbot button was for app feedback, not feedback on the activity, so never clicked on it (Task 3)	4
Didn't want to feel like the app was "hiding options" from him while in the chatbot (Task 3)	3
Thought that the curated list of activity options made sense (Task 1)	0
What city am I opening the app in? (Task 2)	2
Wanted to caption the photo (Task 3)	2
Thought that displaying past activities means you can't do them anymore	2
"I want a way to add things"	3

Fig 22: P4 Critical Incidents

P5	
Incident	Severity
"Oooh I like this, it's like the serendipity I was just talking about!" (Task 1)	0
Didn't understand how to find friend information, but explored until he found solution (Task 2)	2
"What do my friends have to do with this?" (Task 2)	2
"If my friend (who is an artist) recommended this, I would definitely be interested" (Task 2)	2
"Google Maps is Creepy!" (Task 3)	3
Thought the feedback screen needed a pronoun (Task 3)	1
"I might just ignore the app entirely because I'm at the museum now" / Wasn't sure what the value would be once he was there (Task 3)	3
Seemed surprised that the app used metadata when asking for feedback (Task 3)	1
Was not sure where is photo was getting uploaded to (Task 3)	2

Tried to refresh by pulling down the screen (Task 3)	2
Thought that the feedback button was to give app dev feedback (Task 3)	4
Didn't want to use voice at all! (Task 3)	3
"I would be astounded!" Expressed great satisfaction at the idea of his preferences being updated from the chatbot (Task 3)	0

*Fig 23: P5 Critical Incidents*

## 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 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 Ray Thai, David Zhou, Jeff Woo, Netta Wang 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 research and my participation in it. I give my consent to have data collected on my behavior and opinions in relation to the team's research. I also give permission for images/audio records/video of me being interviewed 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 \_\_\_\_\_

Participant Number \_\_\_\_\_

Date \_\_\_\_\_

Signature \_\_\_\_\_

Witness name \_\_\_\_\_

Witness signature \_\_\_\_\_

*Fig 24: Blank Consent Form*