yourway

Your personal, on demand travel guide anywhere.

Final Written Report

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Problem and Solution Overview

When traveling, people often have difficulty finding specific next steps based on their interests without sacrificing time and spontaneity to create detailed plans. Our app, yourway offers hyperlocal, personalized, real-time recommendations to guide people through open-ended travel situations.

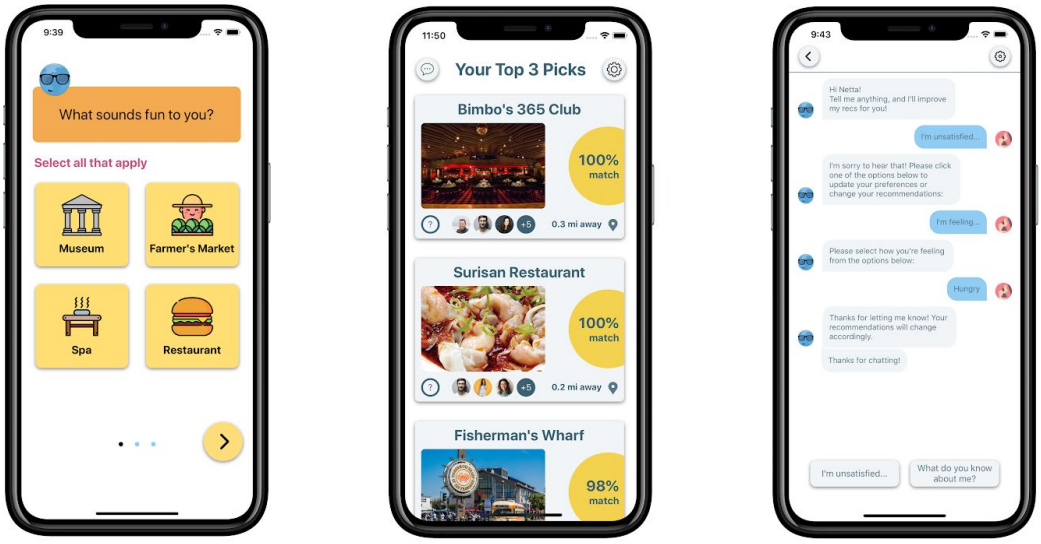


Figure 1: High level overview of solution including preference survey, home screen activities, and chatbot interface

Task and Final Interface Scenarios

Task 1 (Simple): Figure out what you can do nearby

We chose this as our simple task because receiving one's activity suggestions is the most fundamental and common complete action a user can make on this app. Assuming the user is using the app for the first time, this task includes moving through the initial introduction screens and filling out the survey so the AI can begin to learn the user's general preferences when traveling.

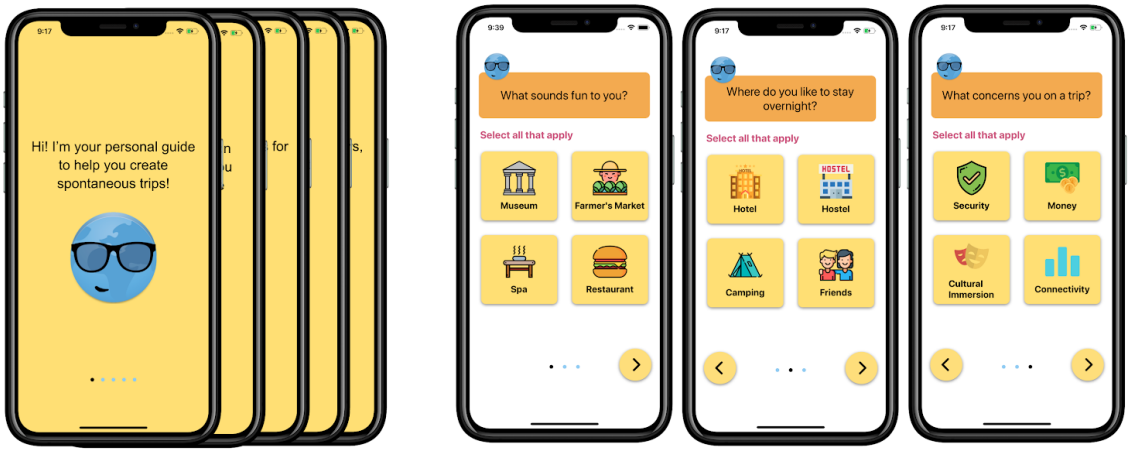


Figure 2: Users complete an onboarding information flow, which takes them to the three question preference survey.

Then, the user is prompted to connect their Facebook so the AI can learn from the user's profile and friends. The calendar is then connected so the AI can look out for schedule conflicts when suggesting activities.Finally, the app asks for location services to be turned on, so that it may limit activities to what is nearby to the user.

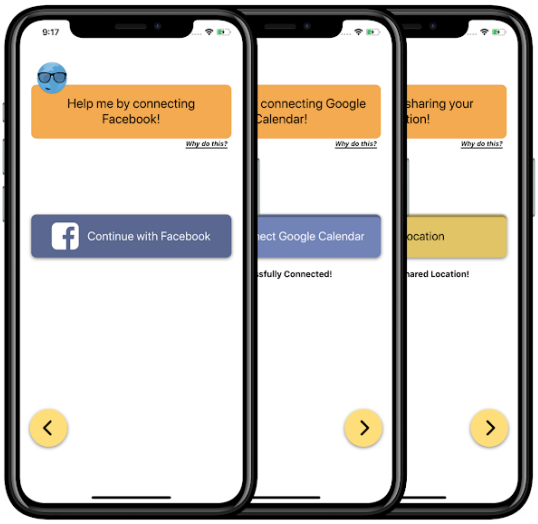


Figure 3: User completes an integration flow including Facebook, Google Calendar, and Location Sharing. Only Google Calendar is optional.

Upon completion, the user will see their nearby activities on the home screen. These activities are recommended based on our cosine similarity algorithm and represents the three options that best match the user's ideal preferences.

Figure 4: User flow from onboarding completion to home screen.

Task 2 (Moderate): Figure out what your friends have done before

Our moderate task involves seeing how the user's friends have engaged with the given recommended locations. In the fully developed version of this app, friends' previous actions would help us better inform our AI selections as another source of input for recommendations. We chose this task because we found in our needfinding that friends' recommendations and social proof were important elements in both personalizing and validating the recommended activities. The first sub-task of this task, connecting one's social media channel, was already done in the earlier onboarding procedure in task 1.

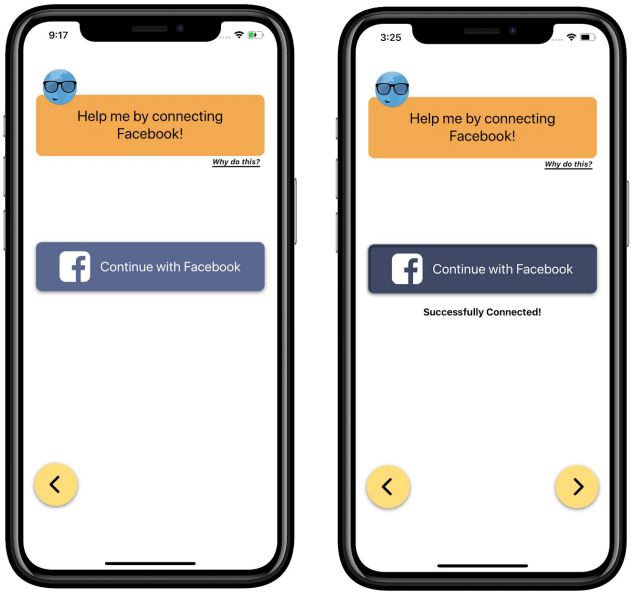


Figure 5: User flow for required connection of Facebook to integrate social proof

The user can then see if their friends' have been to each activity on the home screen. When selecting an activity, the user can see which friends have visited, their description tags, and reviews from friends.

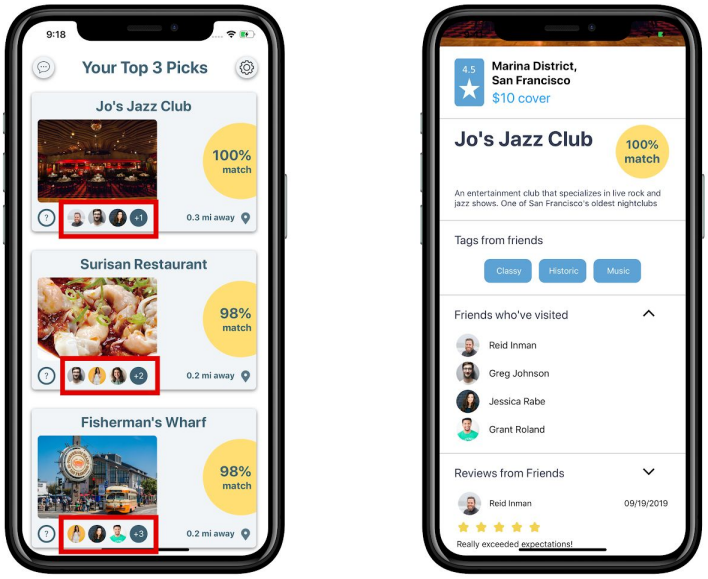


Figure 6: Friend information immediately appears on the home screen per recommended activity. If a user clicks on the activity, they can more detailed information.

Task 3 (Complex): Personalize your travel experience

Our complex step involves personalizing travel experiences based on evolving user preferences. We provide three mechanisms for personalization: the preference survey, rating system, and chat-bot to. We chose this task because we wanted to allow advanced users to continue to develop their preferences over time. The survey mentioned in task 1 captures the user's initial preferences, which will help personalize recommendations.

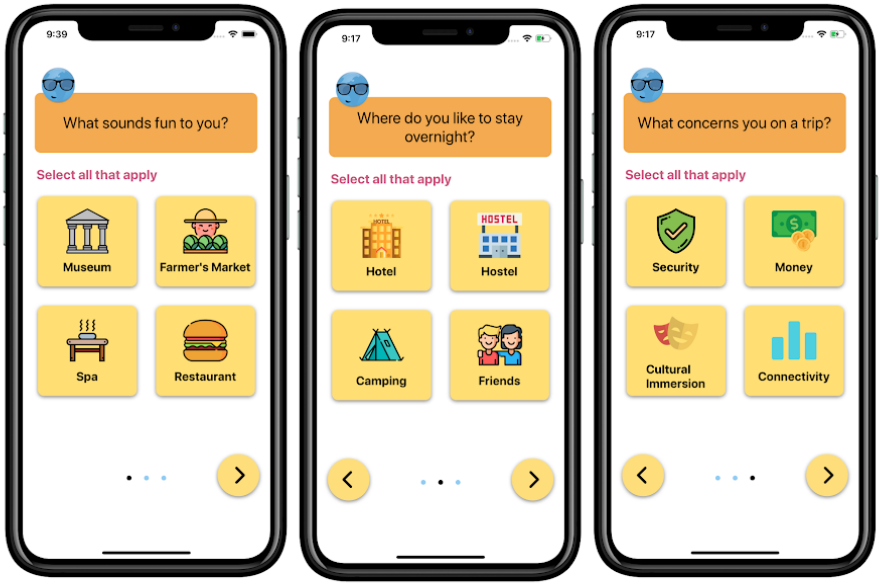


Figure 7: User flow for completing the preference survey. Each question is optional.

After a user finishes an activity, they can rate the activity and provide other types of feedback like description tags. This information would be fed into the AI's similarity score model to better inform recommendations. The review flow can be seen here:

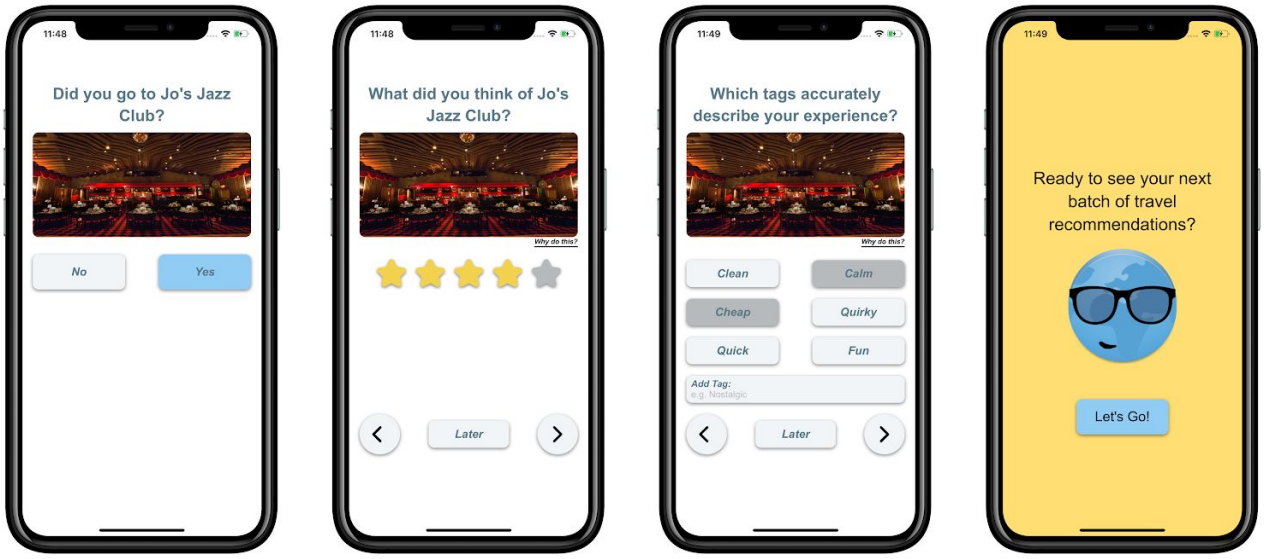


Figure 8: User flow for completing an activity review, leading to AI recommendation updates.

Another method of updating one's preferences is through chatting with the globe-faced chatbot. The user can decide between various pre-selected texts, such as "I'm unsatisfied…" or "What do you know about me?". The first sentence will expand the conversation to allow the user to explain if they are hungry/bored/tired, wanting something specific, or disliking a specific activity.

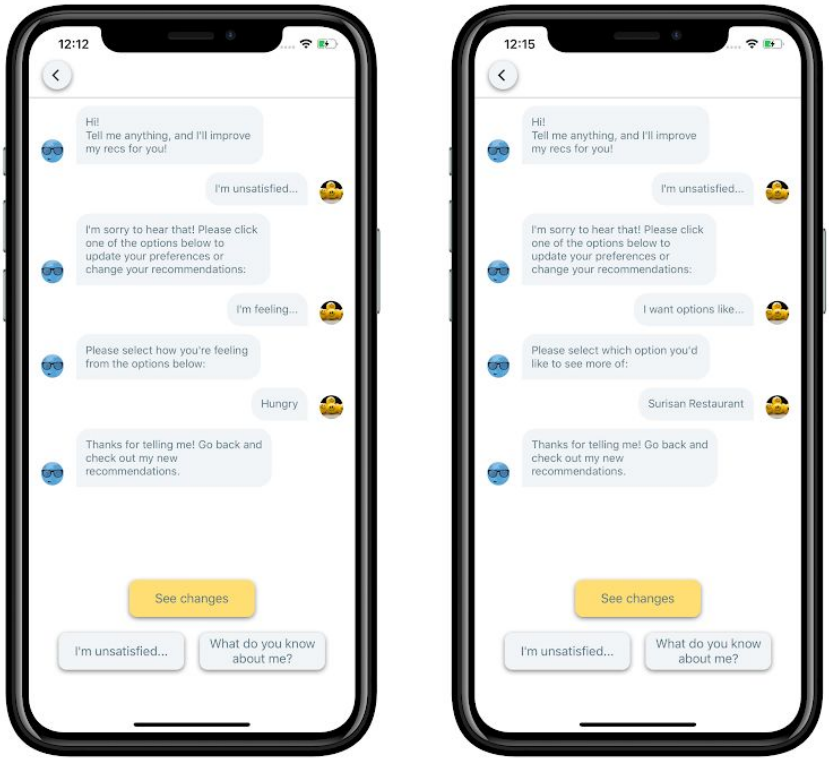


Figure 9: User flow for expressing different interests (left) and wanting to see more options like one presented (right) through the chatbot.

The second question will allow the user to see what information the AI has gathered about the user. As the AI discusses what it knows about the user at a high level using accessible language, the user can correct the AI to help it learn more about the user. Their answers further inform the accuracy of the similarity scoring.

Figure 10: User flow for expressing dislike of an option (left) and discovering what the AI has learned about the user (right) through the chatbot.

Design Evolution

Initial Sketches

We initially came up 5 different sketches for various types of interfaces this app could have, such as an AR-based virtual tour guide or a map with various recommendations in a given radius. Ultimately, we decided on one sketch based on the idea that users would be provided with the three top activity recommendations given their location, hobbies, and friends' recommendations. The emphasis would be on the limited number of personalized activity options for next-best action decisions.

Figure 11: An example sketch from low fidelity prototyping. This sketch was the inspiration for the final solution.

We chose this option because in our initial interviews, we found that decision fatigue was a large part of what made travelling difficult for people. We steered away from the AR solution because not only was it more technically challenging, but a discussion with Prof. Landay helped illuminate that novelty does not necessarily equal value. 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. We then created the storyboard below:

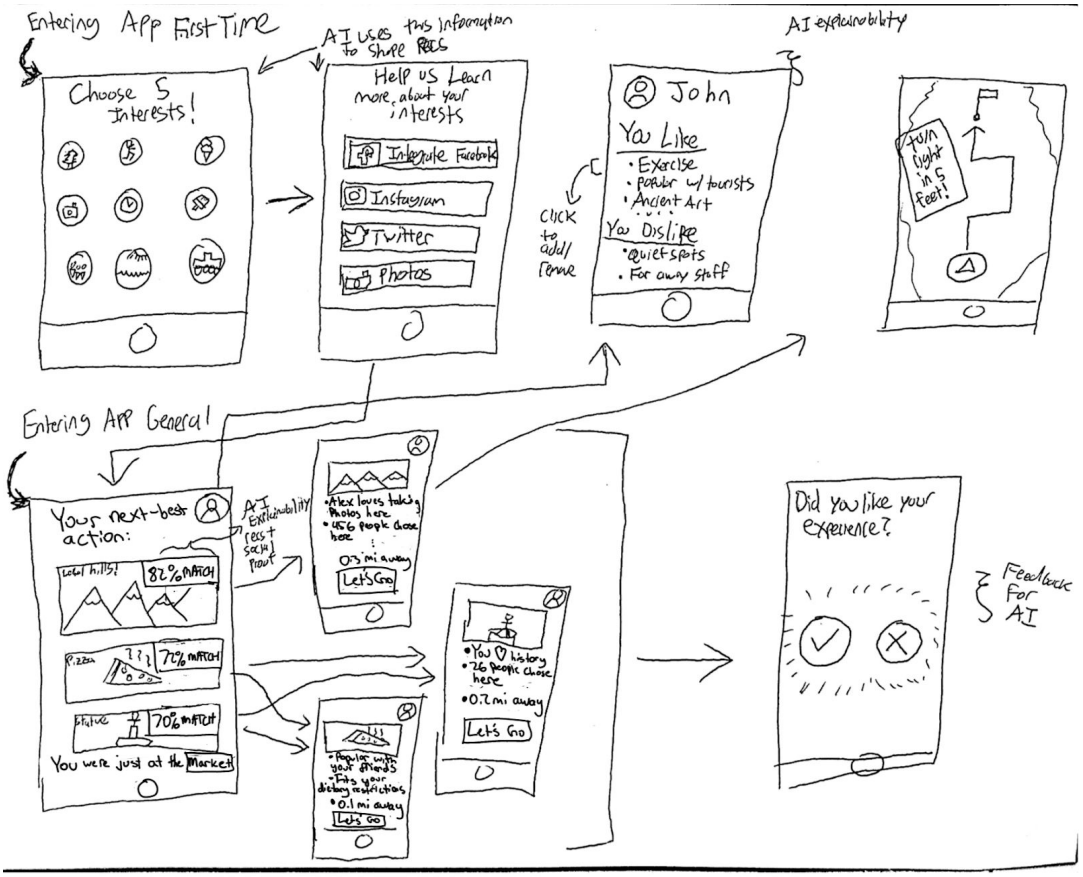


Figure 12: Detailed storyboard sketch that inspired our final solution.

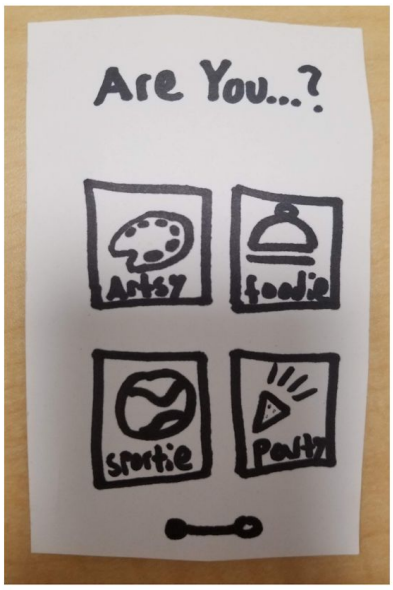
Low-Fi Prototype

Figure 13: All of the screens from the lo-fi prototype. Each piece of paper represented a different screen in the user experience.

We built our lo-fi prototype out of cardstock and post-it notes. We performed our low-fidelity user tests on 5 participants, and found that while the large majority of the users liked the concept of the app and said they would use it while traveling, there were a variety of design changes that would be necessary to use this application successfully.

Major Design Changes from Low-fi to Medium-fi

1. Survey
    a. 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. We created a survey with new questions that still looked to rank the user in the same ways (artsiness, foodiness, etc) but did so indirectly through asking more grounded questions. Instead of asking one question, we asked several.



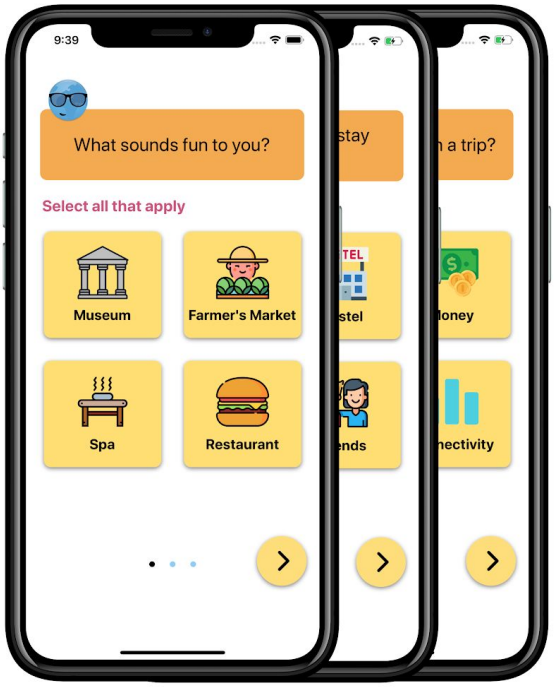


Figure 14: Evolution of preference survey from putting users in boxes in the lo-fi to being more general and multi-question.

2. Social Proof
    a. Information about social proof (how many friends have visited and/or rated this place) 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.

Figure 15: Evolution of home screen to include social proof upfront.

Major Usability Problems Addressed

Heuristic Evaluation Violations (Severity 3 or 4)
Before and after photos can be found following each violation.

1. H1, S3

a. Problem: Chatbot does not explicitly state that recommendations have been updated after the conversation. Users can only press the back button, which may be confusing.
b. Our fix: We added an explicit button that says "See changes" every time the chatbot makes a change to the AI algorithm. This way, the user can verify that changes have been made and have a clear way to navigate to them. We also changed the chatbot's language to say "go back" to further indicate that the back button also works for seeing changes.

Figure 16: Evolution of chatbot experience after heuristic evaluation. "See changes" is signposted to reduce confusion and the chatbot says "Go back" to imply that the back button will show changes.

2. H6, S3
    a. Problem: Information about friends that are shown on the home page (where the user can pick between 3 activities) are not replicated again in the detail page for each activity, so users must memorize friends' profiles.
    b. Our fix: We added additional friend information to the detail page of each activity so that users can see an explicit list of friends who've visited a place, and see their reviews. To prevent this from being overwhelming, these pieces of information are collapsable.

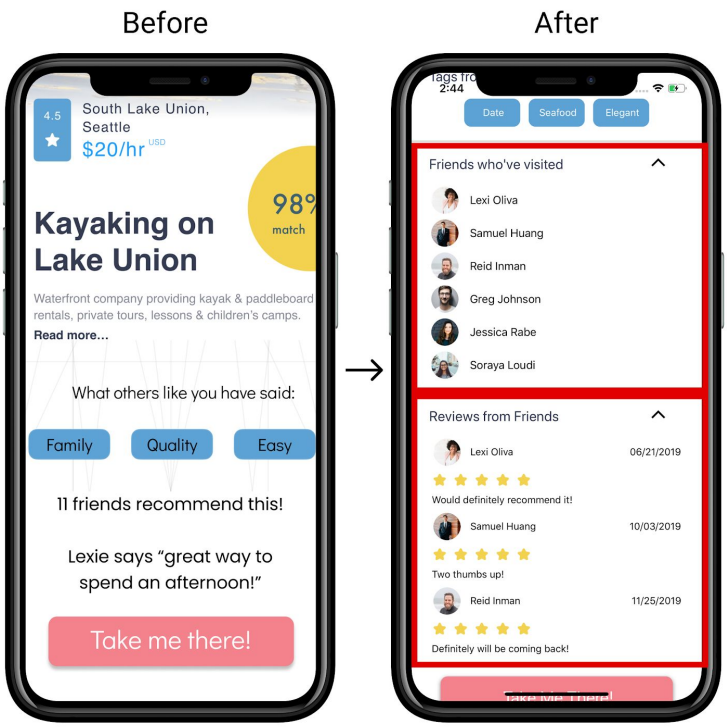


Figure 17: Evolution of activity screen after heuristic evaluation. It is now clear which friends have recommended an activity and what all of their reviews are. Information is collapsable to not be overwhelming for users.

3. H6, S3
    a. Problem: The descriptors in the user profile (like "Water Sports," "BBQ and Grill Food") don't match the descriptors from the onboarding quiz the user takes to describe their preferences (like "Hiking," "Farmer's Market"). The user is told they can edit these descriptors later, but they are not able to recognize the options they initially selected, since they aren't quite the same in the profile.
    b. Our fix: We changed the wording in both the said "descriptors" presented to the user and the onboarding survey so that it is clear to the user that we are collecting a general sense of preferences in order to make better specific recommendations, rather than expecting a one-to-one match of survey answers to recommendations. We also removed the section in the Settings page where users can see and remove their preferences; instead, we allow users to talk to the chatbot and alter their responses accordingly. When the chatbot explains what it knows about a user, it now speaks in general terms (e.g. liking inexpensive things) as opposed to specific Likes and Dislikes.

Figure 18: Evolution of "likes and dislikes" after heuristic evaluation. Users can learn more about themselves through the chatbot interface and the information presented is more generalized.

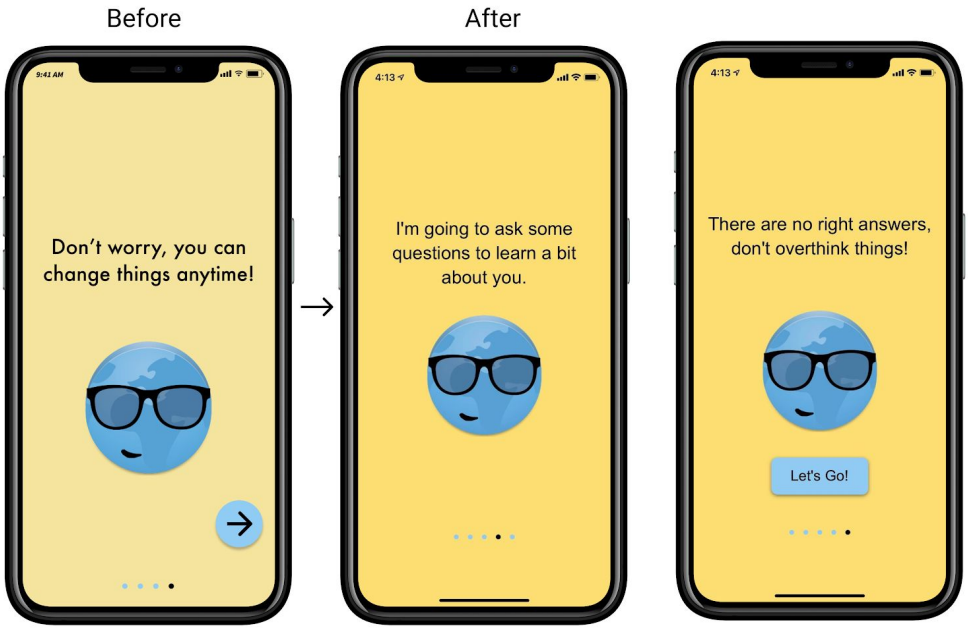


Figure 19: Evolution of onboarding after heuristic evaluation. We try to be more clear that the questions are generalized.

4. H9, S3
    a. Problem: There is no way for the user to say they didn't actually go to the selected activity (what if I opened Google Maps, decided it was too far, then changed my mind) or change their mind after clicking "Take me there."
    b. Our fix: We added an additional screen before the review process to ask if the user actually went to the selected activity. If they did not, they would return back to the home screen with no changes made.

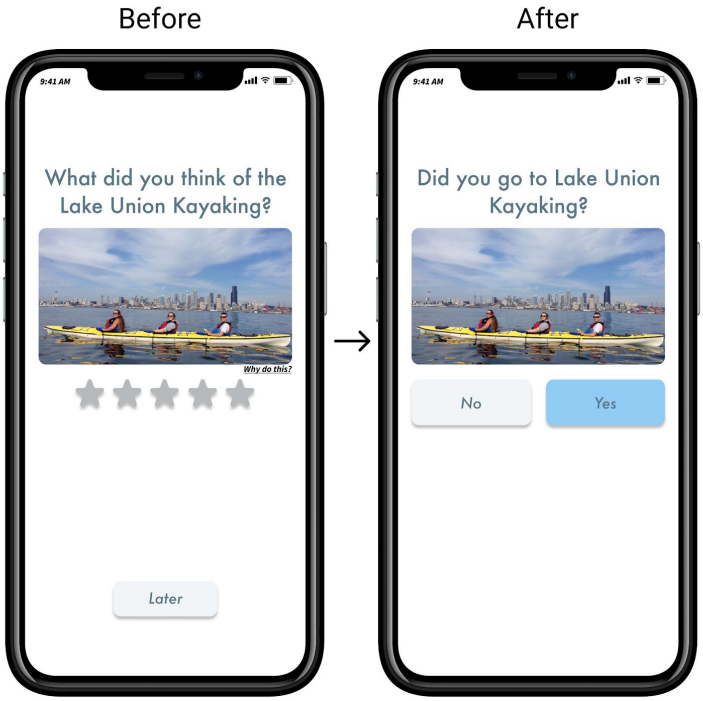


Figure 20: Evolution of reviews after heuristic evaluation. We allow users to opt out if they did not visit a location.

Beyond these severity 3 changes, we also made quite a few improvements from lower severity heuristic violations and recommendations from Parastoo. These include:

- We completely remodeled the Settings page. Instead of the Settings page giving users the option to see and remove "traits" we've learned about them, we created a FAQ page, an option to see past experiences, redo the survey, and disconnect their social media or calendar. We still wanted to retain transparency for users, however, so we moved the ability to see and edit "traits" into the chatbot.
- We added pictures of each suggested activity on the home page and redesigned it to improve its overall UI.

- We created a more robust activities page with drop-down sections which detail exactly which friends have visited the location and specific reviews from friends.
- We added a chatbot button in the top left corner of the home screen so that the user could find the chatbot without need to scroll down.
- We used buttons to navigate away from the Globe screens because auto-loading in React Native was causing unexpected effects.
- We added the ability to skip reviews and come back to them later in the Settings section.
- We made the chatbot experience only allow pre-set inputs rather than free-form text because of technical limitations.
- We also made significant minor cosmetic changes such as font changes to Arial because of technical limitations with custom font loading in React, minor gridding changes for iOS, and workshopping the language used throughout the app to be less technical.

Prototype Implementation

Tools

We used Figma to create all of our designs, and then implemented them using React Native and Expo.

Figma was incredibly useful in that it was quick and intuitive to learn and allowed for collaborative design. We also looked to free online sketch resources for pre-made themes and app frameworks that could be imported into Figma to experiment with and gain inspiration.

React Native and Expo were helpful in that they allowed us (even Ray, the lone Android/Windows user of the team!) to be cross-platform collaborative in coding the app. React Native also came with many pre-made packages that we could use to help with specific parts of the app, such as the chatbot. However, there were several challenges with using both tools. For React Native, certain basic functions such as darkening the opacity of the entire screen behind a pop-up was impossible; instead, we manually grey-scaled every image and text, which doesn't look as natural as we'd like it to. Furthermore, there were limitations to using a pre-made chatbot package that went against our Figma designs such as ellipses messages while the chatbot is thinking. We had to make technical design changes as a result. For Expo, Apple products can no longer easily test the application by scanning a QR code, so sharing the app for testing was made much more difficult.

Wizard of Oz

Although our AI cosine similarity algorithm is functional in that it dynamically recommends options based on interaction with the app, we used Wizard of Oz to limit what actually impacts the algorithm. Calendar schedule, location, friend information, and description tags when reviewing should all be included in the AI calculations in the real application. For our prototype, only the survey responses, chatbot interactions, and star reviews directly impact the cosine similarity algorithm.

Hardcoded Data

The Facebook integration, Google Calendar connect, and location services were all hardcoded and pre-set to simplify the code for this application. Since Facebook integration does not use their API, we hardcoded a set of friends and reviews that were associated with each activity. The chatbot user text options were pre-written instead of allowing the user to type their own responses, but we followed this convention since many real applications (such as Woebot and Lark) use it to illustrate to the user what the conversational AI is capable of doing. We hardcoded ten locations in San Francisco as our database of recommendations as opposed to using an extensive API-based database. We perform all of our AI and "database" calculations on the frontend, meaning that there is no real backend to our application.

Future Additions

If we choose to continue further develop this app, we would love to implement the following features:

- Fully implement location services and a robust back-end so that the application can be used in more places than just San Francisco, and offers more suggestions than the 10 events we have in our current database.
- Build out the Facebook connect so real friends' profiles and information show up in the application and inform the AI's decision-making.
- Create a more robust chatbot, either with more text options or with the ability to type directly into the conversation.
- Remodel and improve the AI algorithm by doing things such as taking more inputs from our Wizard of Oz components.

Summary

Traveling is a luxury that many people covet: it can be eye-opening, rejuvenating, and exciting. However traveling can also oftentimes be frustrating, confusing, and tiring. In

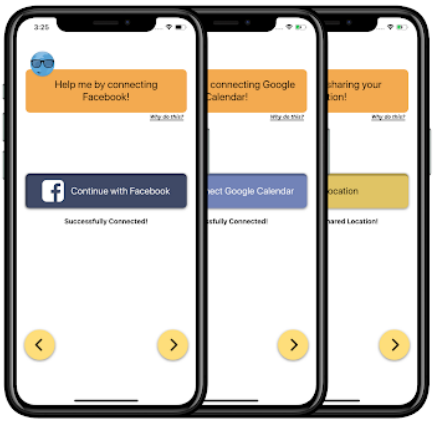
our need finding interviews, we found that many tourists knew where they generally wanted to be (say, San Francisco), but not exactly what they wanted to do in the moment. Decision fatigue and unfamiliarity with the location can make choosing what to do next incredibly difficult. Our app, yourway relieves travelers of this burden by offering users a limited number of curated suggestions on activities they can immediately start doing. We do this by asking users to fill out a preference survey and connect their Facebook and Calendar. By using artificial intelligence, we create an evolving model of who the user is — what their needs are, what their likes are, and what they might want to do in the moment. Going through the design process this quarter has challenged us to be vigorous in our methodology and always think about the user. We will continue to use these practices in our future projects and endeavors.

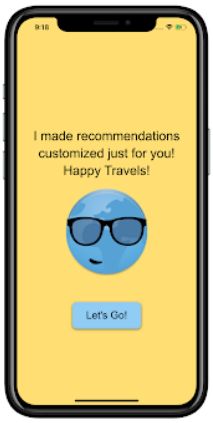
Appendix

Complete Set of Screenshots:

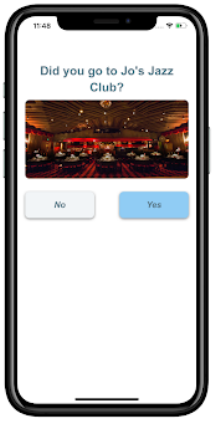

Hi! I'm your personal guide to help you create spontaneous trips!

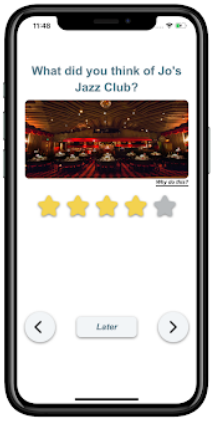

What sounds fun to you?
Select all that apply
Museum
Farmer's Market
Spa
Restaurant
Where do you like to stay overnight?
Select all that apply
Hotel
Hostel
Camping
Friends
What concerns you on a trip?
Select all that apply
Security
Money
Cultural Immersion
Connectivity

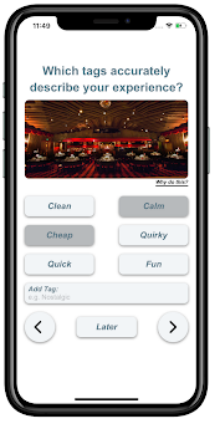

Help me by connecting Facebook!
Continue with Facebook
Successfully Connected!

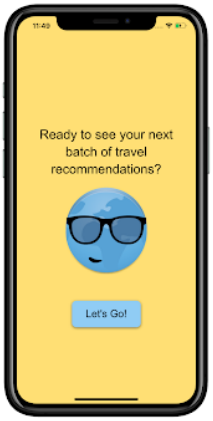

I made recommendations customized just for you! Happy Travels!
Let's Go!

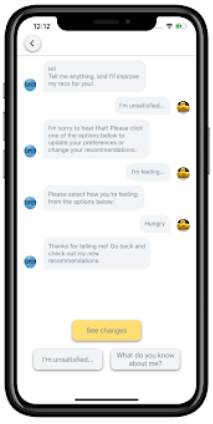

Your Top 3 Picks
Jo's Jazz Club
100% match
Surisan Restaurant
98% match
Fisherman's Wharf
98% match

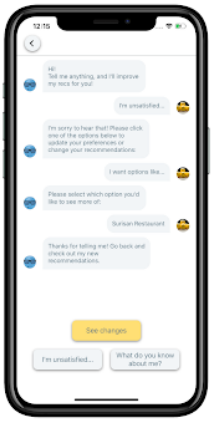

Did you go to Jo's Jazz Club?
No
Yes

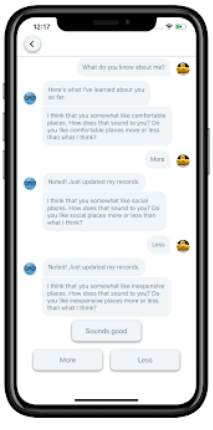

What did you think of Jo's Jazz Club?
Later

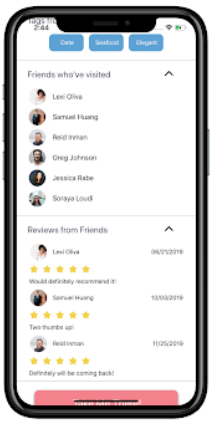

Which tags accurately describe your experience?
Clean
Calm
Cheap
Quirky
Quick
Fun
Later

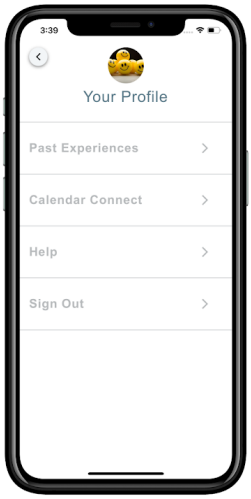

Ready to see your next batch of travel recommendations?
Let's Go!

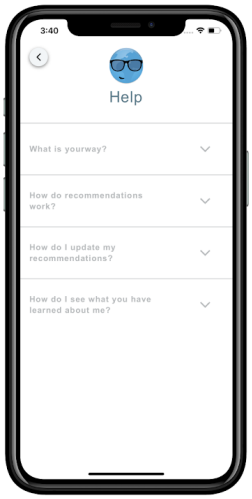


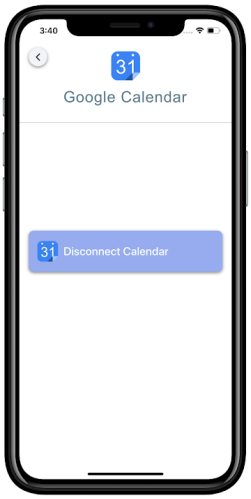





Friends who've visited
Reviews from Friends


3:39
Your Profile
Past Experiences
Calendar Connect
Help
Sign Out


3:40
Help
What is yourway?
How do recommendations work?
How do I update my recommendations?
How do I see what you have learned about me?


3:40
Google Calendar
Disconnect Calendar


3:40
Your Profile
Are you sure you want to sign out?
No
Yes
Help
Sign Out


3:40
Past Experiences
Jo's Jazz Club
New Rating
Go Again