

Pinpoint

Pinpoint Team CIS 401 Project

Members: Maghnus Mareneck (M&T), Jesse Xu, Ivan Esmeral, Priyansh Sharma

Faculty Advisors: Eric Fouh

PART I. PRODUCT ANALYSIS

Introduction

One of the seminal products enabled by the web was the ability to crowd-share reviews, interests, and recommendations. Services such as Yelp, Google, and Facebook all allow for insight into others opinions and experiences at different real-world places. Despite this anonymous, wide-reaching availability, humans naturally form their own, more intimate relationships with those with similar tastes and interests. These similarities flow perfectly into their own recommendation algorithm. In addition, there is no “social” element offered by the current recommendation products. What if you wanted to easily plan a visit to a place with a friend, instead of just visit? All of these lacking features in current established recommendation products inspired us to build a product that solves all of them. Welcome to PinPoint.

In one sentence, what is PinPoint?

Find places with friends, not strangers.

Description

Pinpoint is a social platform for saving and sharing places of interest. In our world today, we rely on finding restaurants, bars, and attractions through tools that host reviews posted by strangers instead of our friends that share the same interests as us. Pinpoint allows you to check out where your friends have been and explore the places that they love.

Who is it for?

Travellers, people who are looking for new restaurants, experiences, and entertainment. The appeal of Pinpoint is universal to anyone with places around them they haven't explored.

What is the need?

Right now, the options in the market for finding new places to go eat, hang out, or explore are based on the recommendations of strangers who you may, or most likely may not, have similar preferences to. We believe a great misconception in the current market is that humans have universal preferences. Instead, we naturally surround ourselves with people who we identify with, can relate to, and have shared experiences, tastes, and attitudes. It's *these* people, not strangers, who are likely to give us the recommendations we like, and can share with others. A new form of recommending new places is needed, where we can find places recommended by those we trust.



Current Recommendation Options

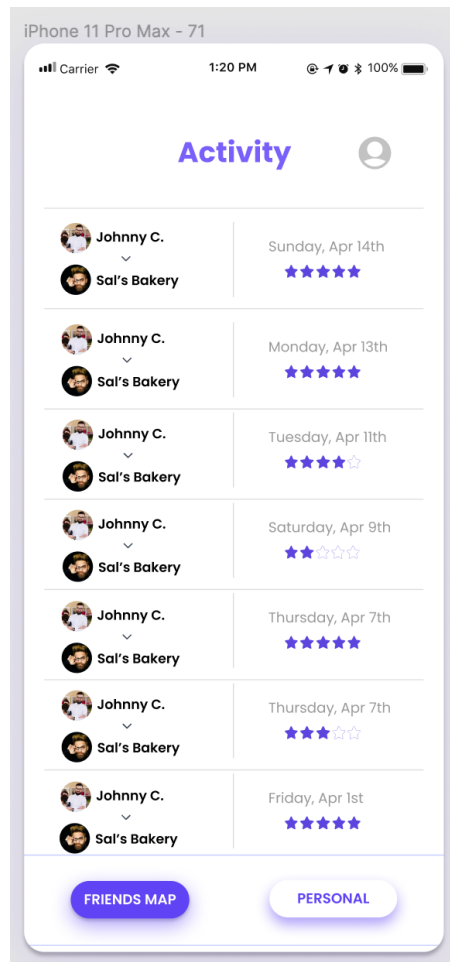
The Solution

Pinpoint is the platform to facilitate this. Friends, when they visit new places, can “check in” and share their instant review. This is populated on the Pinpoint feed, which can be viewed by all of your friends on the platform. Your friends, seeing this, can easily click to see the address of the place, call to make a reservation, or message you about your experience.

Additionally, there is a “map” mode where you can see recommended places around you. In the map mode, you can see both places *you* have been to and rated, and you can also see places friends have been to closeby. This is extremely helpful when in a new place or travelling, as you can see if any places closeby have been recommended by friends (and *which* friends as well!)

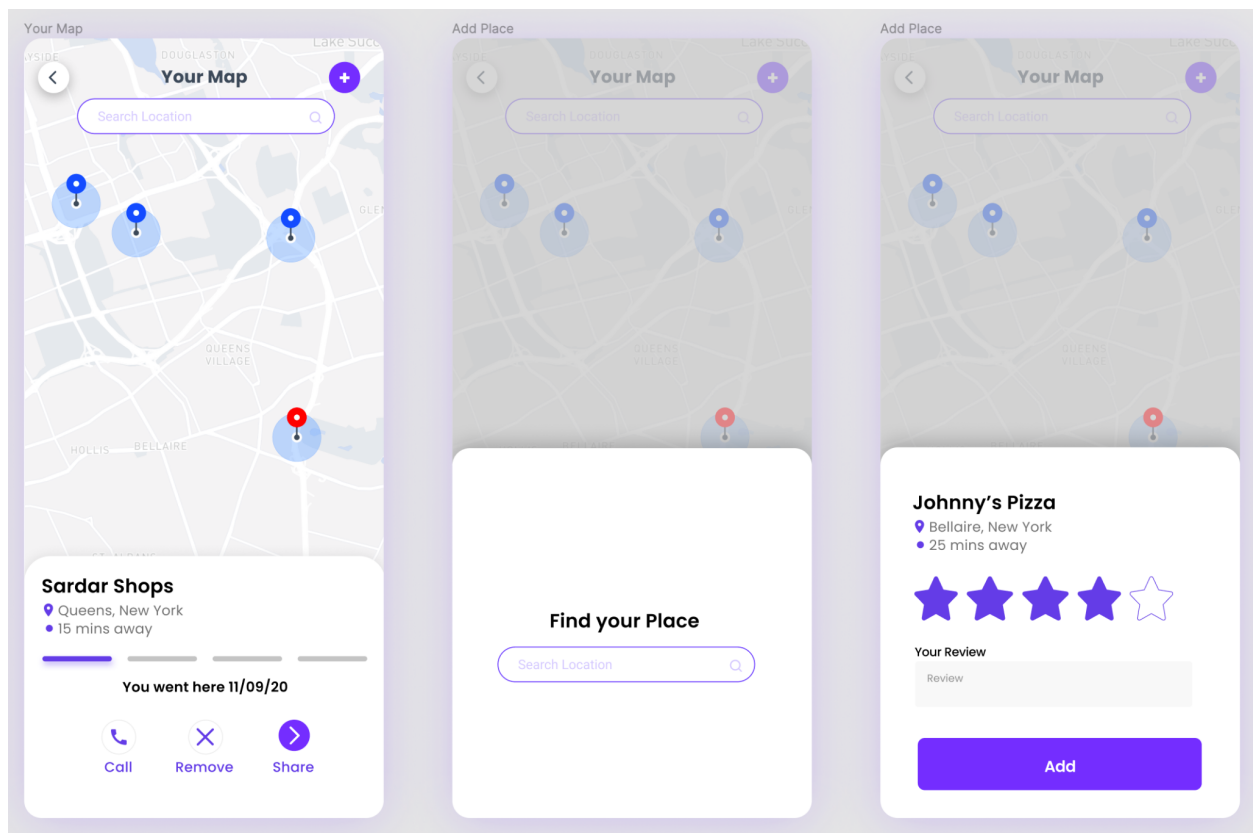
The Product

PinPoint’s UI is extremely simple, and oriented around 3 basic views - the activity feed, the personal map, and the collaborative map.



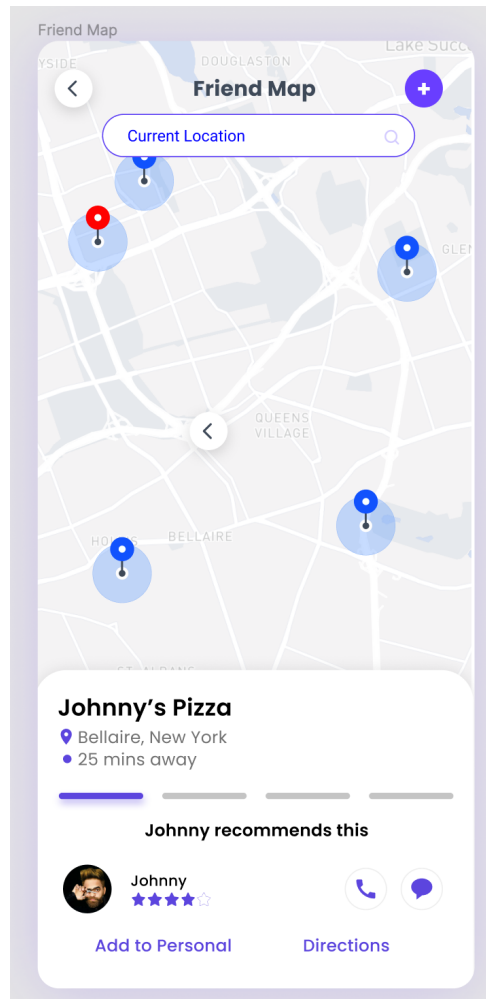
Pinpoint’s Activity Feed

Upon login, the opening page is the activity feed. Here, you see local visits your friend made (with corresponding ratings) to locations around you. This page is a great way to keep in the loop with where your friends are going, what they liked, and to get some immediate inspiration for visits or places to add to your own map. This is similar to Venmo's feed - when you are not actively doing something, it is interesting to see a running log reminding you that your friends are active and to scratch the itch of knowing what they're up to. We hope this page could be the jumping off point for contact - "Hey X, how did you like Y?" - and lead to new visits and experiences.



The Personal Map

One of the two map pages is the personal map. This serves as a general record of the places you've been (just you, no one else). If you're itching to remember that incredible food truck you went to last week where you had the best Halal of your life, it's here, and you can easily get directions to it again or get in contact to place an order. Also part of this page is the ability to add new places to your map. As soon as you visit a new place, you can easily use the lookup function to add it to your map, and leave a personalized rating and message. Imagine "great lamb gyro, very well priced." This can either serve as a useful reference for you, or for others if you decide to share it. Which brings us to...



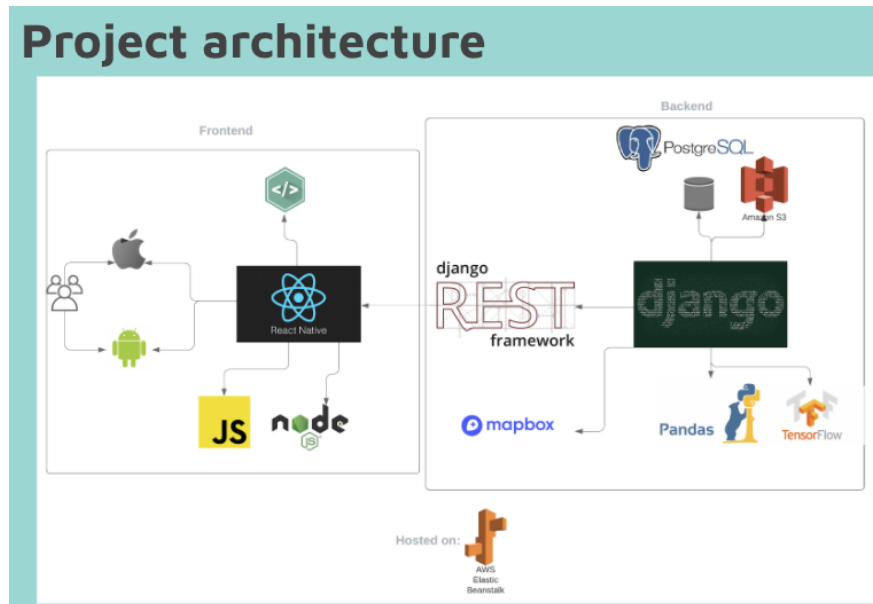
The “Friend” (Collaborative) Map

If you decide to share your experiences with your friends, they will add to a map with their shared locations as well. If you’re seeking to look outside your current repertoire of locations to eat/hang/travel, the friend map is the place to go. Here you can see all the recommendations (with ratings) of places to try, as well as (perhaps as importantly) places that your friends do **not** recommend! From this map, you can easily contact or message the friend who added the location and review if you want to ask a question, or to ask them if they want to go back there with you. Also accessible from this page is adding to your own personal map for safekeeping, or quick ability to get directions.

There are also some other, utility pages worth mentioning but not worth fleshing out. There is a robust search feature to find friends on the app and add them to your friend list (upon acceptance). There is also full functionality to customize your profile, avatar, and personal information, which is kept private to all but your friends.

Technology Architecture

For Pinpoint's tech stack, we used React Native for the frontend in an effort to cater to a primarily mobile audience, and the Django framework on the backend for its ease of integration with our Python ML suite. We are also using the Google Maps and Google Places APIs in the frontend, and hosting each on AWS Elastic Beanstalk.



Visual Representation of Technology Architecture

More specifically, our infrastructure was:

- A Javascript (React.js and React Native) frontend, connected to a frontend Node.js server
- A backend written in Python and running on a Django
- Hosting system using AWS
- A PostgreSQL database
- Integrations with:
 - TensorFlow (for Machine Learning)
 - Mapbox (Maps)
 - Pandas (Data Analysis)

In our final iteration, our app was fully functional on Android (not yet on iOS), and integrated fully with the backend. We were not able to test our scalability, but we believed that we built our backend to handle a significant amount of requests given increased compute power, and would be ready to take on 100-1000 users upon launch.

We faced significant challenges aligning versions of Mapbox with Expo, which was the service we used to pack, compile and run our application code on a mobile device. There were some incompatibility issues here that required changing the source code to fix. Additionally, as our

user state became more complex, we added Redux to our stack for the final week for a much cleaner and more manageable implementation.

PART II. MARKET ANALYSIS

Competition:

We currently see competition from larger recommendation engines such as Yelp, map programs such as Google maps, booking platforms such as Opentable, and traditional recommendation systems such as word of mouth and Facebook. However, all of these platforms operate in segmented, fractured spaces of the recommendation system and thus don't provide cohesive value. Yelp and Google Maps offer reviews but not tailor-made to your community. Facebook and word of mouth offer access to your community but do not facilitate easy access to all recommendations simultaneously in a map-visible format. Pinpoint captures the entire value chain by allowing users to see all recommendations in an accessible and *actionable* (i.e. you can immediately get directions to a certain place) format.

Revenue Model

We are still ironing out our plan to monetize the Pinpoint network. Our current ideas are (note, all are based on a "freemium" model for the user):

1. Non-intrusive advertising to incentivize members of a friend network to try out a new place
 - a. This would be especially valuable to businesses given the depth of knowledge that Pinpoint will obtain about friend groups, preferences, and the ability of a successful recommendation to convince a group of people, not just one.
2. Promotions that businesses can offer members redeemable through the Pinpoint network (with a small percentage going to Pinpoint)

Market Segment Analysis

Assumptions:

- We will keep our analysis to the US market for now, where we will first launch
- The US restaurant industry is approximately \$800 billion
- The US travelling industry is approximately \$180 billion (domestically)
- The in-person entertainment industry is approximately \$50 billion (domestically)
- The average expenditure a user at any of the above locations is \$20

If we assume that, fully scaled, we can capture 10% of these US markets in terms of *becoming the initial recommendation engine that leads customers to their next restaurant/movie theatre/play*, we could be responsible for \$103 billion in transactions.

If we assume that 50% of those transactions we facilitated were accompanied by paid advertisements, we can break down our predicted revenue. If this corresponds to a total of 2.5 billion transactions and we charge an average of \$1 in advertising for each one, that is \$2.5 billion in revenue.

Of course, there is even more availability in scaling as we consider more verticals outside of restaurants and entertainment (perhaps planning trips to different countries in the lucrative travel sector, or coordinating meetups online).

Cost Analysis

We don't imagine there being substantial costs outside development, and maybe some marketing efforts. This product has extremely strong network effects, if popular. We would predict organic growth stemming from friends inviting other friends to spur the majority of our growth, without the need for paid marketing.

Development cost for this would additionally be relatively low, perhaps requiring 2-3 fulltime engineers to manage scaling and feature implementation, and a full-time PM. Estimated cost for this would be around 300-500k a year, and would likely suffice until the platform hit a million users. Given these low costs, we see a path to profitability should this business be pursued.

PART III. CONCLUSION

As a capstone project for our four year (in my case, five year!) Engineering education, we are proud of the work we did and it was clear to me how PinPoint was a productive combination of many of the skills we have developed from scratch in various classes. The project required a combination of pure engineering skill, developed in core CIS classes like CIS110, 120 and 121, collaboration ability like that developed in CIS350, and a certain amount of "scrapiness," which we each learned in our various internships and programming experiences outside class. It is truthfully an incredible feeling to know that I, for one, went from not being able to write any code to participating in a team creating a full-featured, potentially sellable software product in only a couple years. We faced few issues in splitting up the tasks among frontend, backend, and middleware implementation, and often came to each others aid when needed. In sum, building PinPoint was an excellent experience for all of us, and hopefully a good omen for our technology futures that we are just beginning.

A big thanks to the entire M&T staff for supporting me and our team, and to our advisor Professor Fouh, who helped us put the "pedal to the metal."