CMU Housing Recommendation Engine

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Agenda

- Vision
- Problem
- Approach / Solution
- Application
- Market
- Business Model
- Competition
- Go-to-Market

Our Vision

Create a customized **recommendation platform** for college students to find **local housing** near the university

Who are we

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CUSTOMER PAIN

2.7

Average months searching*

-6.1

Net Promoter Score for rental situation, which means “not satisfied”**

Current Solution

Obtain info from multiple sources, then integrate them by users

Current Cost

Not expensive but time-consuming

Disadvantages

Energy-consuming, time-wasting and annoying

* ZILLOW GROUP. ”CONSUMER HOUSING TRENDS REPORT”, 2019
** RESIDENTRATED GROUP. " KEEPING RENTERS HAPPY REPORT”, 2019

SOLUTION

A recommendation platform that integrates information relevant to CMU students

Attributes:

Integrated databases

Designed house rating system

Benefits:

Easier choice for housing

Saves time and energy

Data Source

Craigslist

property information

Yelp

restaurant information

CMU Shuttle

shuttle stop and schedule

Google Map API

distance and transport information

Data Source - Craigslist

CL pittsburgh > housing > apts/housing for rent

apts/housing for rent

« search apts/housing for rent

- [ ] search titles only
- [ ] has image
- [ ] posted today
- [ ] bundle duplicates
- [ ] include nearby areas

MILES FROM ZIP
miles | from zip

PRICE
min | max

BEDROOMS
min - max

BATHROOMS
min - max

FT²
min | max

AVAILABILITY
all dates

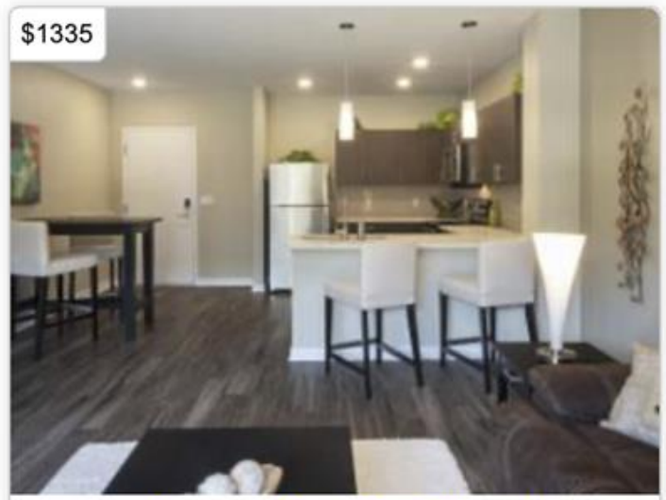
- [ ] cats ok
- [ ] dogs ok
- [ ] furnished
- [ ] no smoking
- [ ] wheelchair access
- [ ] EV charging
- [ ] no application fee
- [ ] no broker fee

▸ housing type
▸ laundry
▸ parking

gallery | << | < prev | 1 - 120 / 3000 | next > | newest

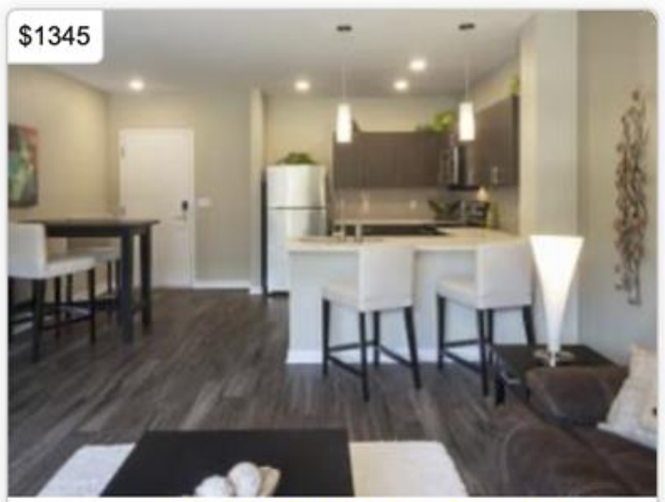
☆ Feb 24 3 bedroom rental home house ford city $675 3br - (Ford city)

☆ Feb 24 Secured Entry, Lots of Closet Space, Sliding Glass Doors $795 1br -



☆ Feb 24 Cosmopolitan, Ross Township $1335 1br - 775ft² - (Pittsburgh)

☆ Feb 24 1BR Apartment on East Liberty Blvd W/ Central AC and Parking Incl $775 1br - (Pittsburgh)



☆ Feb 24 Cosmopolitan, Ross Township $1345 1br - 775ft² - (Pittsburgh)

☆ Feb 24 Deluxe Single Bedroom, Near Restaurants & Shops, Aug 1st $912 1br - 657ft² - (Regent Square - Frick Park)

Data Source - Yelp API

yelp

Restaurants | 5000 Forbes Ave, Pittsburgh, PA 15213

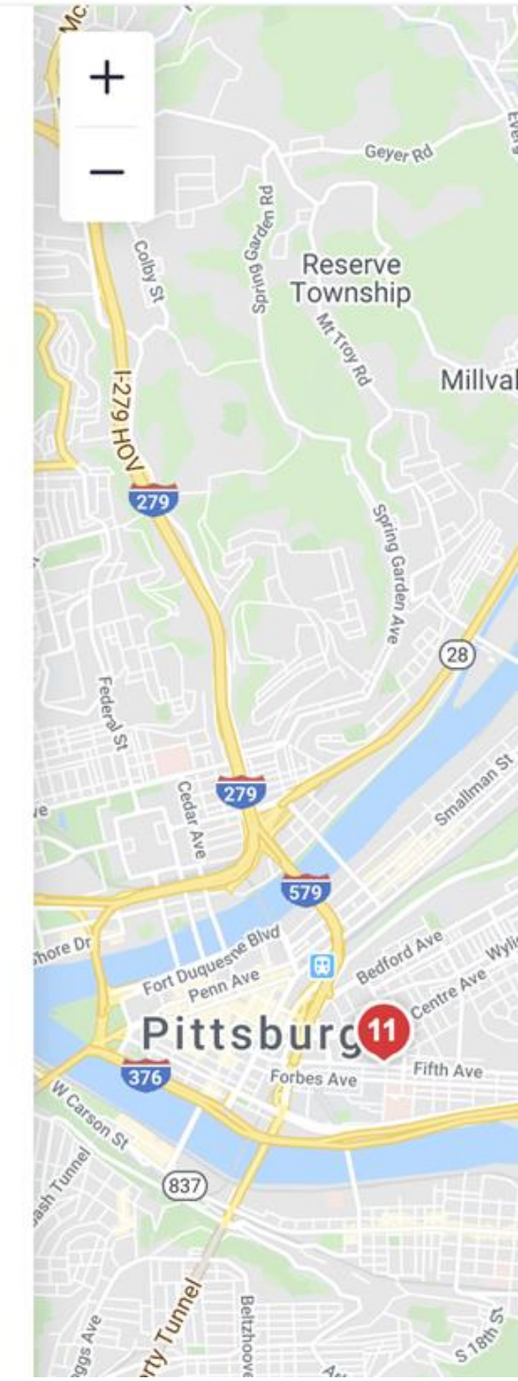
Restaurants | Home Services | Auto Services | More

Best Restaurants near Carnegie Mellon University in Pittsburgh, PA

5000 Forbes Ave, Pittsburgh, PA 15213

All | Price | Open Now | Delivery | Takeout | Reservations | Waitlist

Mon, Feb 24 | 7:00 pm | 2 people | Find a Table



Sponsored Results ⓘ

Choolaah

312

$$ · Indian

1.5 Miles

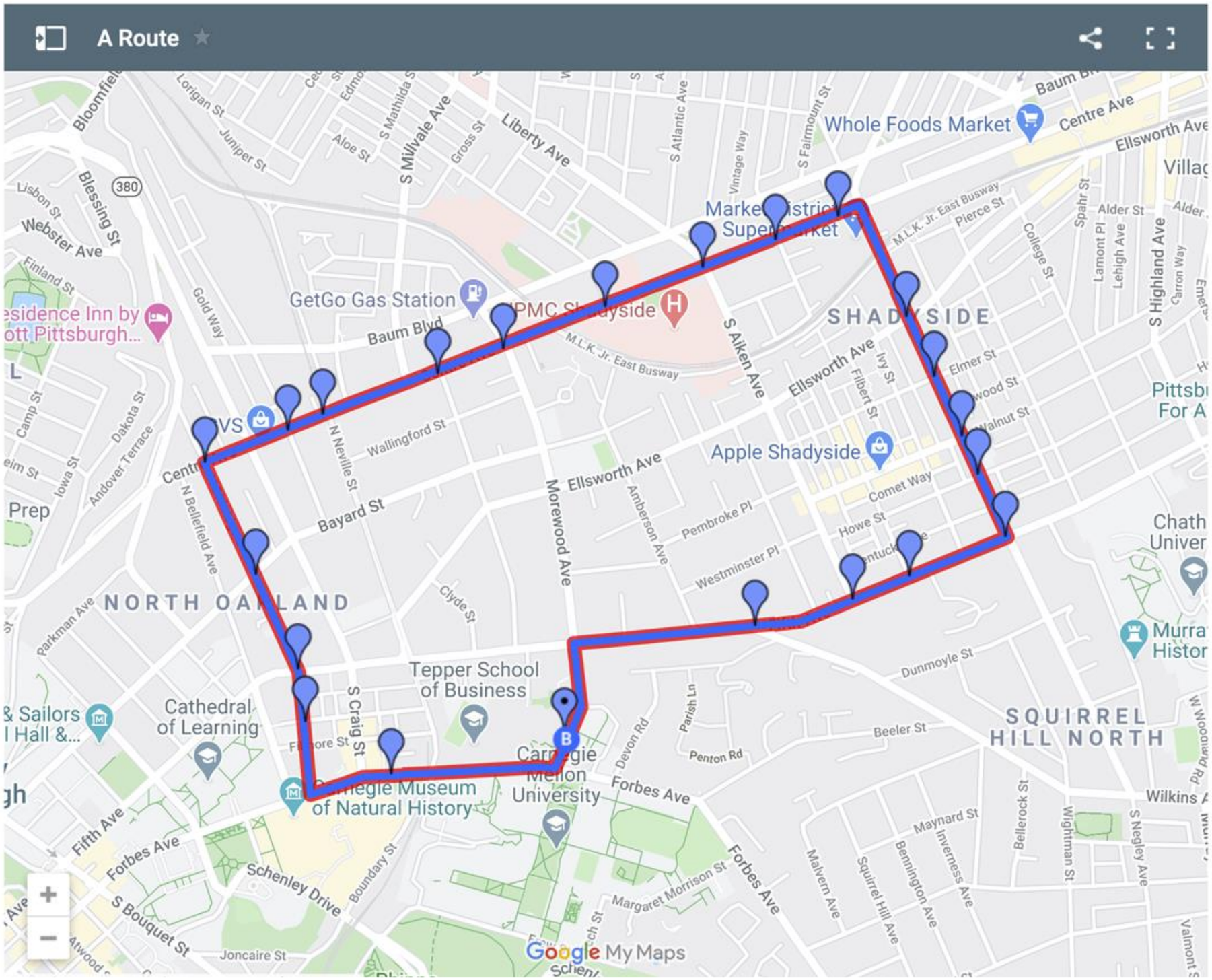
(412) 503-7797
6114 Centre Ave
Shadyside

"Dear Choolaah, please take my money. I don't think there's another **restaurant** where I could feel so good about going out to eat, and for so many reasons. Here's the backstory for..." more

Start Order

Offers delivery

Data Source - CMU shuttle



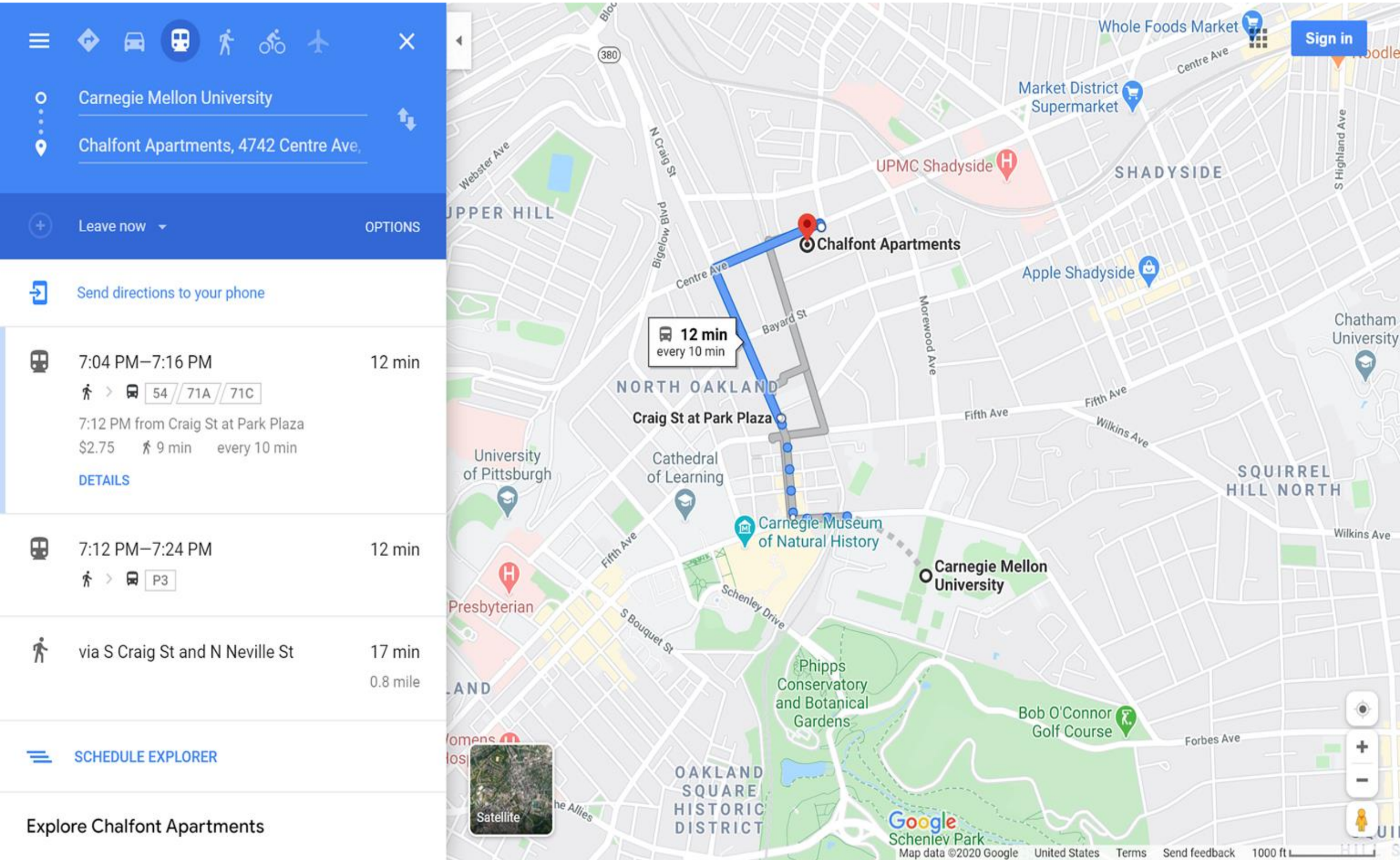
A Route

- Shuttle Stops
- Departure Times

Other Routes

- B Route
- A/B Route
- Bakery Square Route
- PTC Route
- Escort Service

Data Source - Google Map API



Data Utilization

- Extract the most useful data

What do CMU students care about?

- How did we combine data?

Location of properties

- How do we rate properties?

Assign different weights to attributes → overall score

Rating Rubrics

Dynamic rating system based on the available choices

The weight of calculation can be further learned via machine learning algorithms.

Product Features

Help Menu

`main.py -h` presents a help as shown below:

```
usage: main.py [-h] [-l] [-y] [-s] [-a] [-p PRICE_FILTER [PRICE_FILTER ...]]
               [-t TOP]

optional arguments:
  -h, --help            show this help message and exit
  -l, --latest          Fetches latest properties from Craigslist
  -y, --refresh_yelp    Refreshes restaurants database with latest info from
                        Yelp
  -s, --refresh_shuttle
                        Refreshes shuttles database with latest info from CMU
  -a, --refresh_all     Refreshes all databases and uses latest information
  -p PRICE_FILTER [PRICE_FILTER ...], --price_filter PRICE_FILTER [PRICE_FILTER ...]
                        Optional price range filter. Usage: -p <MIN> <MAX>
  -t TOP, --top TOP     Number of properties to be displayed
```

Housing recommendations

Step 1: Input 'y' to see the property recommendations

```
Show the top 6 properties we recommend? (y to continue, exit to quit)
```

Example output:

```
1. One Bedroom Available 08/01
Neighborhood: Oakland
Size: 415.0 sqft
Number of bedrooms: 1
Price: 845$/month

2. ★Available NOW--AC--Hardwood Floors--Closet Space--Heat Incld!★
Neighborhood: Squirrel Hill / Murry Ave @ Forward Ave
Size: 770.0 sqft
Number of bedrooms: 1
Price: 1295$/month
```

More details about the property

Step 2: Select the property number from the displayed list

```
Select a property for more information : (type 'exit' to quit)
```

Example output:

```
--------------Transport Information---------------

Distance to nearest bus stop: 82.0 meters
Distance to CMU: 3222.0 meters
Distance to downtown: 6409.0 meters
Distance to nearest shuttle stop:  2.00149035835956665) meters

 --------------------Restaurant--------------------

5 restaurants near by
Restaurant name: Selamis Turkish Kebab House
Rating: 4.5
Restaurant name: BFG Café
Rating: 4.0
Restaurant name: Nak Won Garden
Rating: 3.5
Restaurant name: Spork Pit
Rating: 3.5
Restaurant name: Friendship Perk and Brew
Rating: 4.5
```

Marketing Strategy

Market

Target market: Students looking for housing options around the university (CMU students only at the beginning)

Market size: Over 10,000 customers a year. Most of them will be non-local students of CMU, Pitt, and Carlow

Market drivers: Rental agencies, existing rental websites, individual house owners, and students moving in and out of the town

Business Model

Revenue model

charges: Ads and service

from:

- local rental companies
- house owners
- restaurants

Pricing details: the proportion of house sold through our website

- **Basic:** free to users but property owners will pay for advertising
- **Premium:** Work with a real person and get recommendations based on historical data

Business Model

Evaluating metrics

Advertisement conversion rate

Overall conversion rate

Average advertising revenue

Average order value

Lifetime value for customers

Willingness to advertise

COMPETITION

- Key Players

Local rental agencies - Amore Management, Arbors Management.
Websites - Zillow, Padmapper, etc.

- Market differentiator

specifically designed for college students, no similar competitor sintegrate information from multiple sources to make customized recommendations.

Our product is specifically designed for college students, unlike craigslist that is for general purpose classifieds or zillow that looks at a broader customer base. Which do not have a similar competetor

LAUNCH STRATEGY / GO-TO-MARKET

Customer Acquisition Approach:

- **Start-up stage:** Promote among students through posters on campus, social media and chat platforms. Build a minimum viable product with filters on distance to university and downtown, reviews of groceries and restaurants nearby, and rating transportation options

- **Expansion stage:** Build additional filters and trackers for users to narrow their search and effortlessly follow up

- **Key driver:** Seasonal demand and supply, effectiveness of filters and recommendations (for effective ads).

- **Potential milestones:**

  5000+ user signups in first year,

  $250,000 ad revenue in first 3 years.

Thanks

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