

Pitstop Pal: An Intelligent Assistant for Drivers

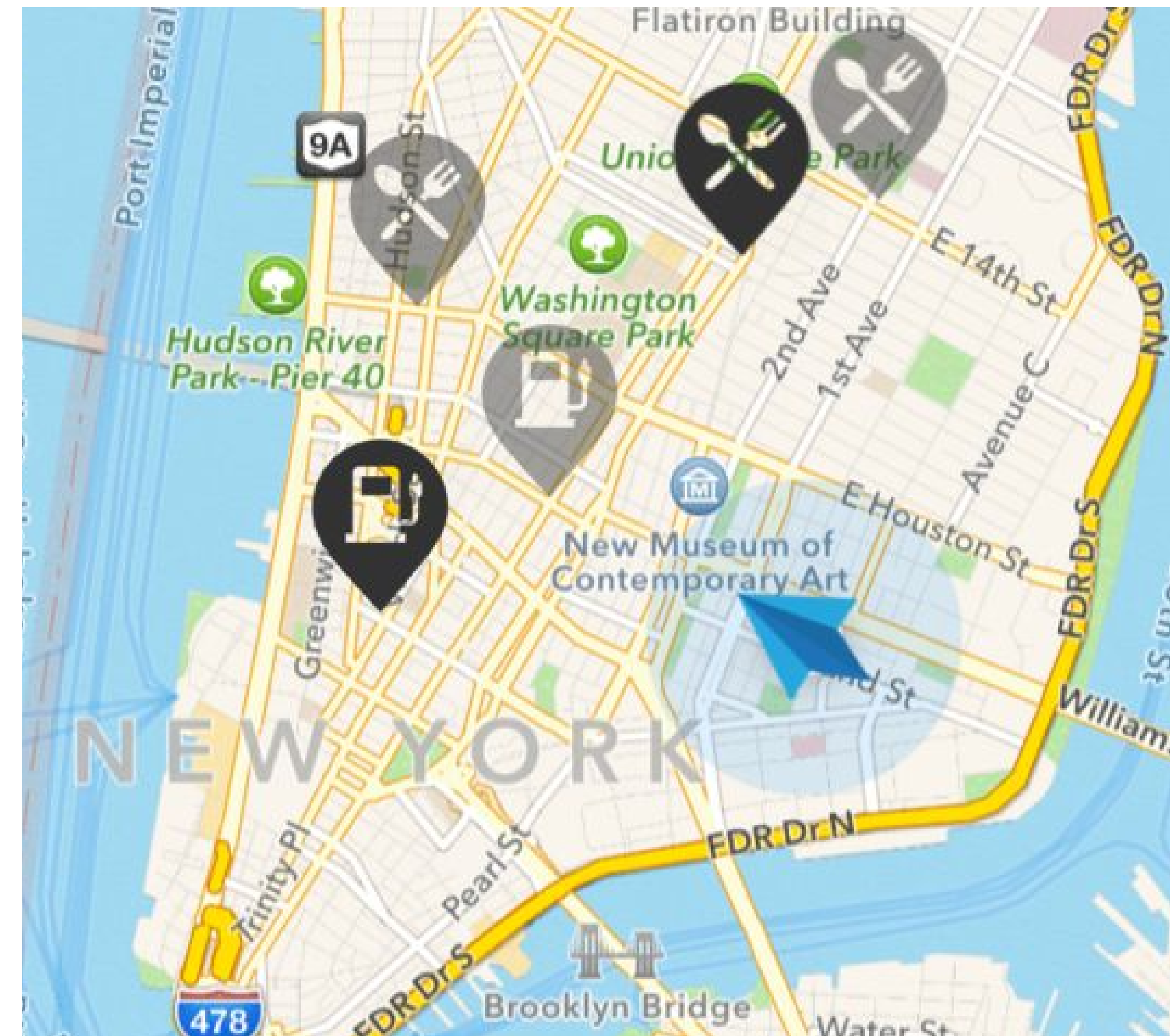
Providing Personalized Restaurant and Gas Station Recommendations

Chris Baier, Spencer Buja, Flavio Fiszman, Jing Sun, Austin Urlaub

Current Challenges

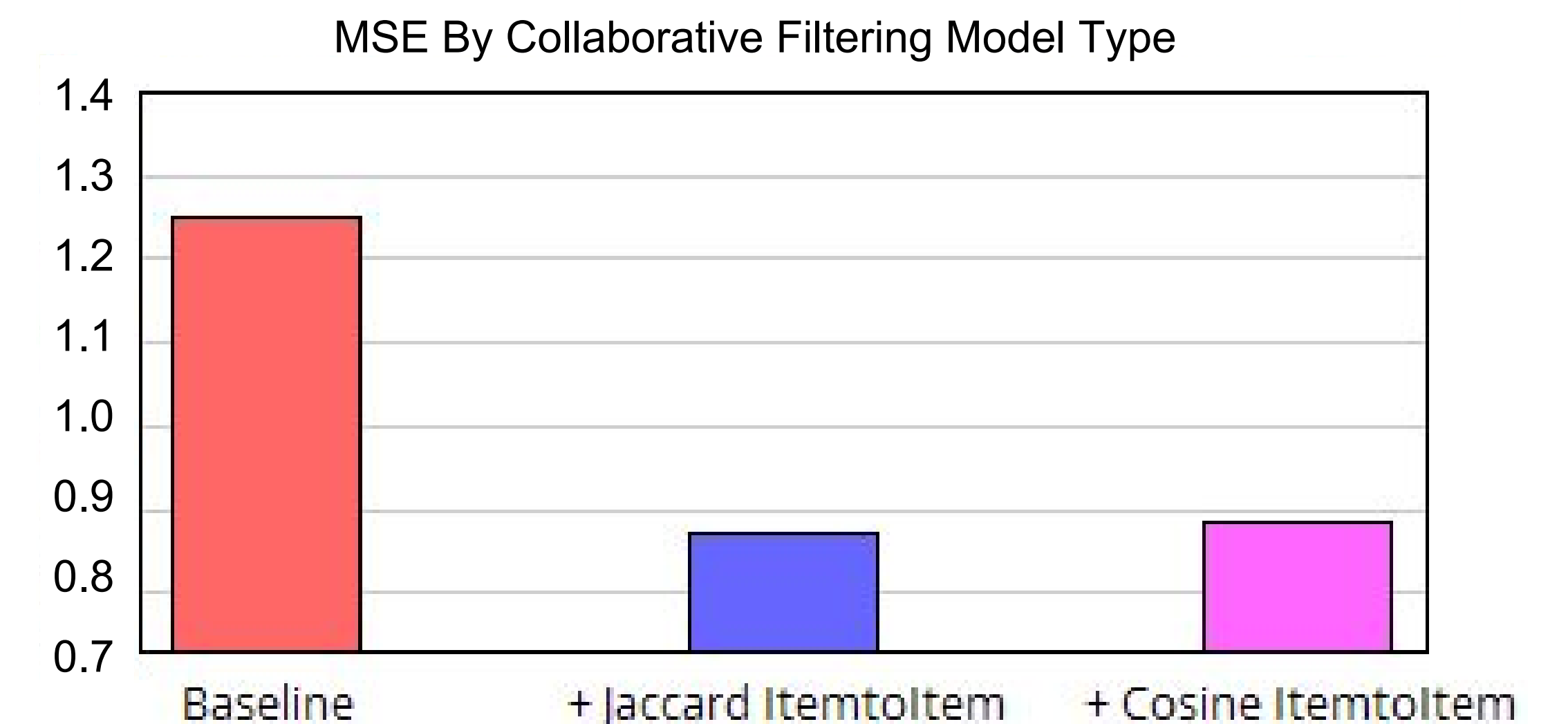
- Need fluid way to find gas stations and restaurants for drivers
- Hard to find personalized recommendations
- Requires manual interaction which distracts from driving

Old Solutions

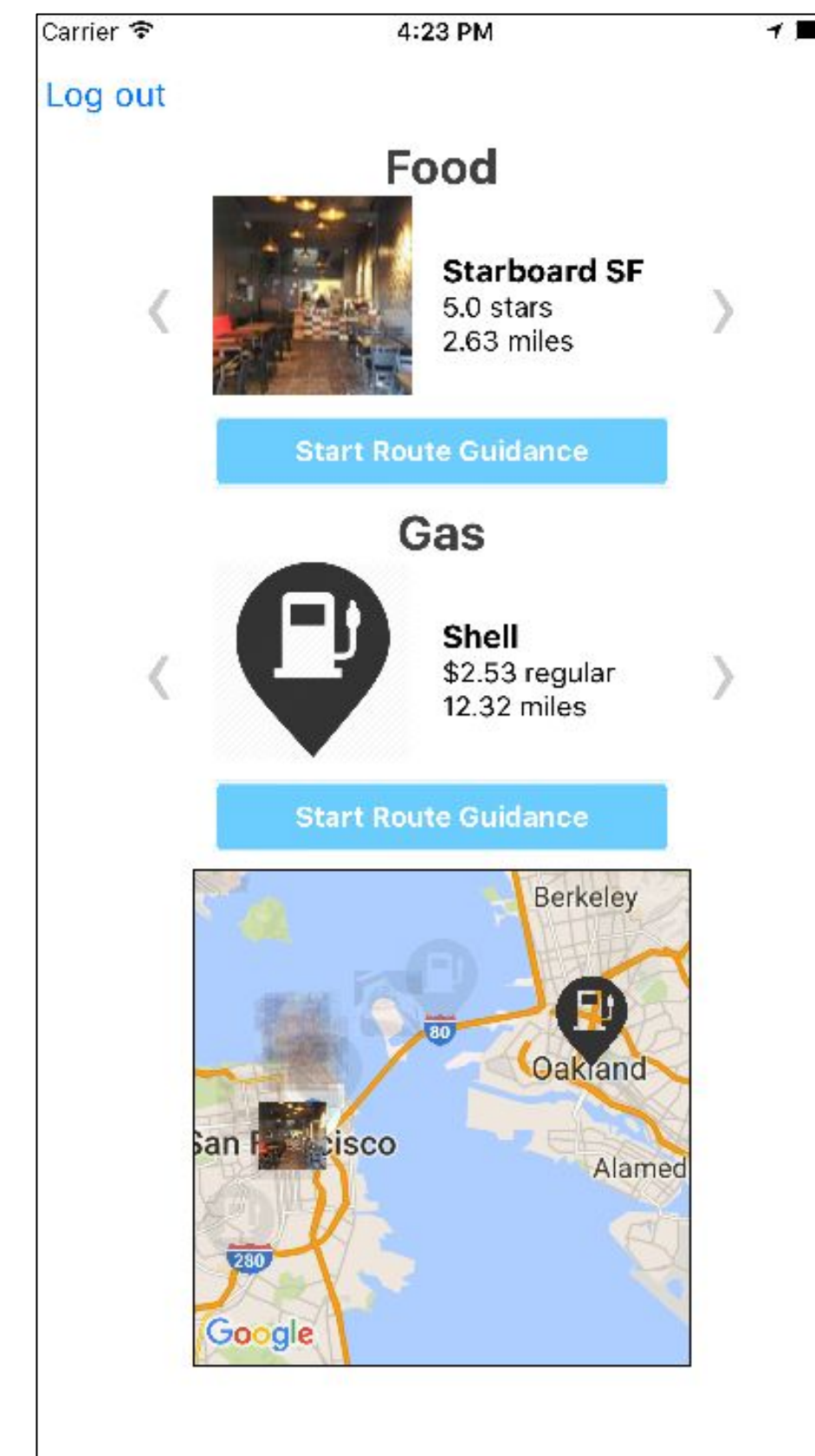
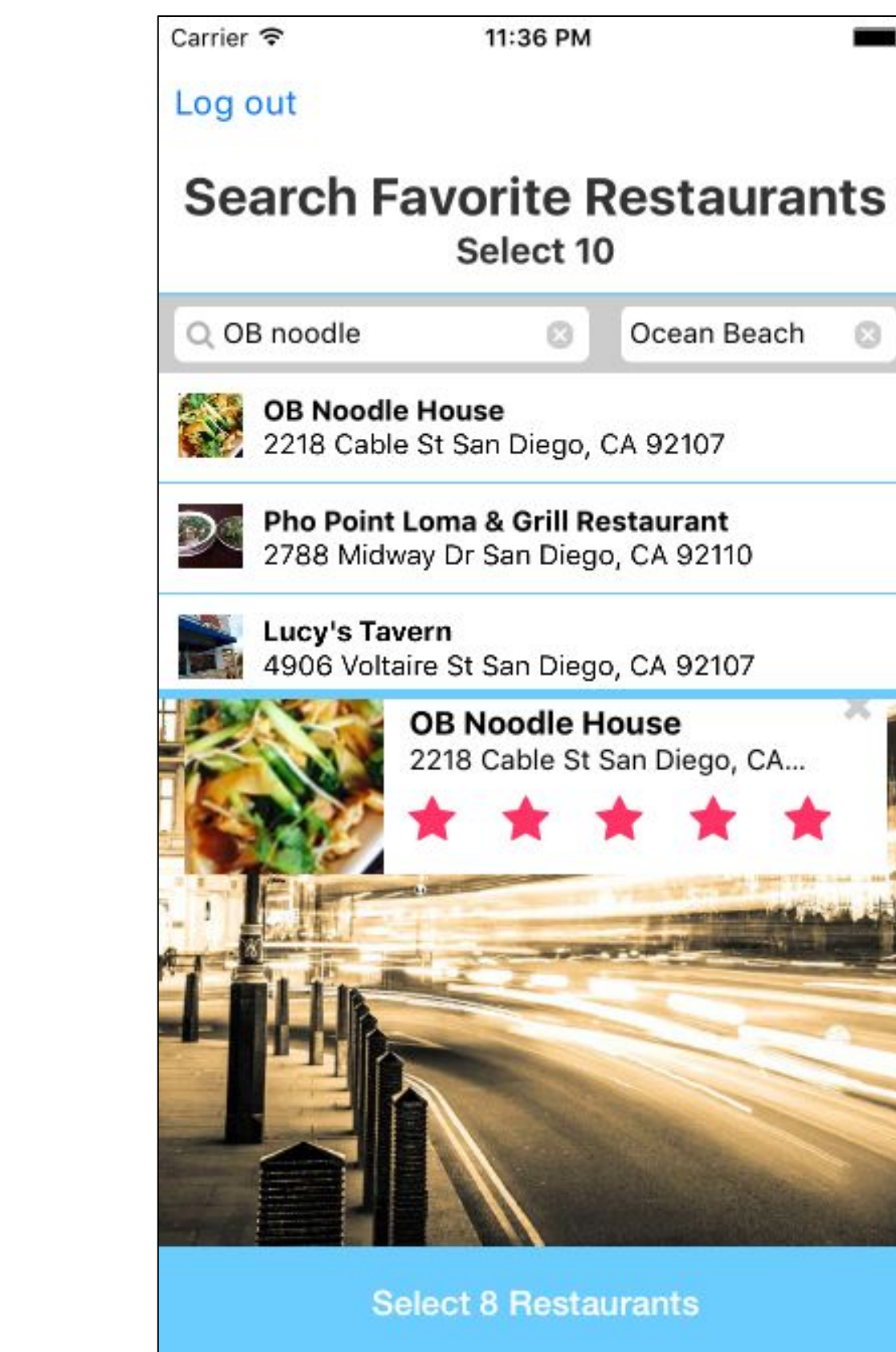
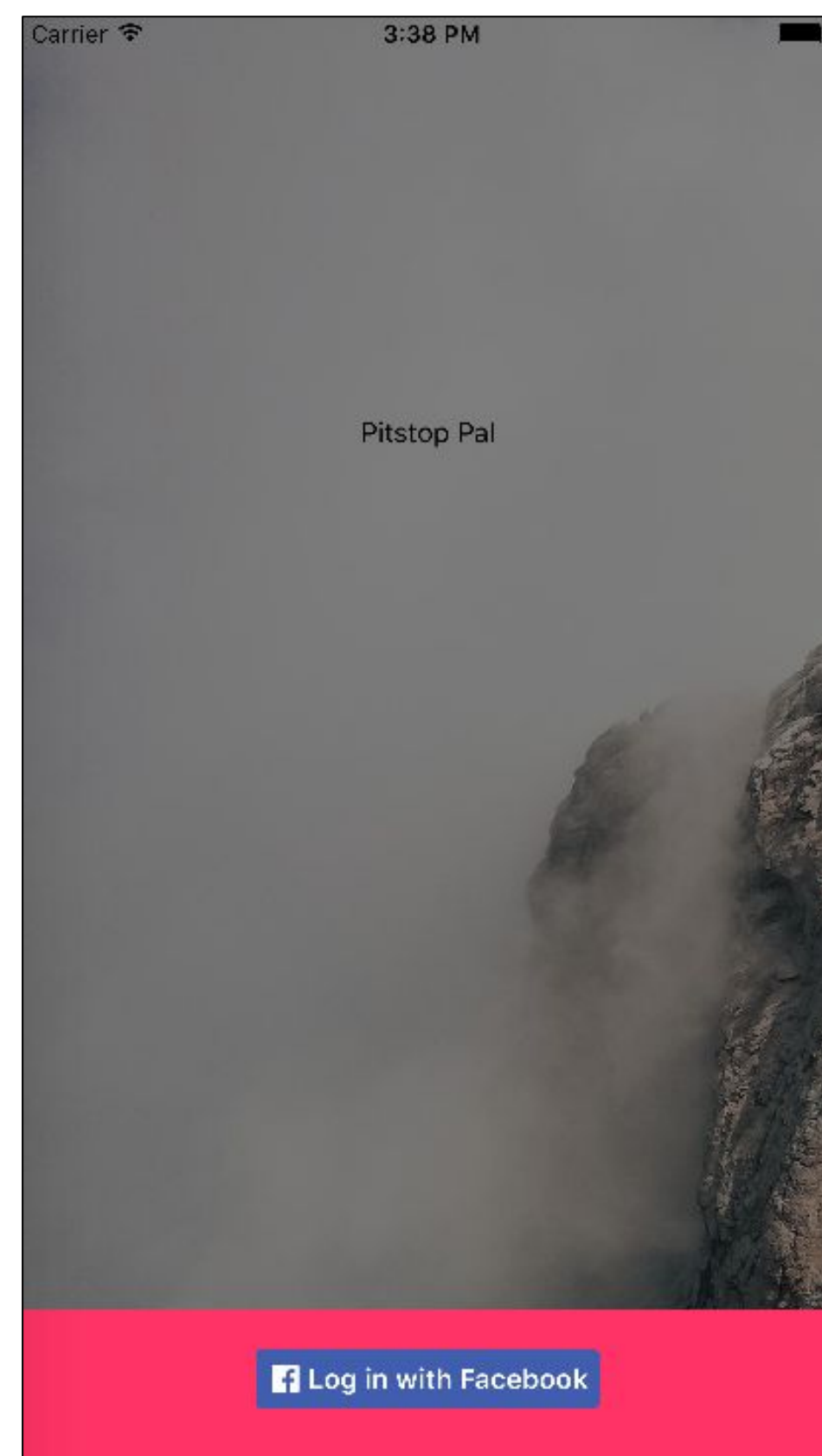


Verification of Success

- iPhone app requires less user-app interaction.
- Give real-time options.
- High accuracy of personalized recommendations (MSE).



User Interface



Personalized Recommendations

- Collaborative filtering used to give restaurants within 25 mile radius personalized ranks
- Recommendations refresh every 5 minutes
- Restaurants sorted by predicted rank
- Gas stations sorted by cheapest price per regular gallon

$$pred(u, i) = \frac{\sum_{j \in ratedItems(u)} sim(i, j) * r_{uj}}{\sum_{j \in ratedItems(u)} sim(i, j)}$$

$$sim(i, j) = \frac{\sum_{a \in Rated(i, j)} (r_{ai} - \bar{r}_a)(r_{aj} - \bar{r}_a)}{\sqrt{\sum_{a \in Rated(i, j)} (r_{ai} - \bar{r}_a)^2} \sqrt{\sum_{a \in Rated(i, j)} (r_{aj} - \bar{r}_a)^2}}$$

Pred and *sim* are the essential functions for collaborative filtering. *Pred* predicts a rank of restaurant *i* for user *u* given that *u* has not rated *i*. *Sim* computes the cosine similarity of restaurant *i* and *j*. This is done over all pairs of users *a* that have rated both restaurant *i* and *j* where *a* is the user pair, *r_{ai}* and *r_{aj}* are the ranks each user gave for that restaurant, and *r-bar_a* is the average rating of restaurants for the user *u*.

The login view has a button for Facebook login. Authenticating is necessary to identify each user.

The survey view forces the user to search and rank 10 restaurants. Required once to give personalized recommendations.

The live view shows recommendations. The user can select a place, see his/her location, and get directions.