



CANTINA

AN ALEXA BASED RESTAURANT RECOMMENDER

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MOTIVATION

Provide a means for Alexa-users to search for restaurant options from the comfort of their own home by giving the system a set of parameters verbally via their Alexa devices.

Leverage the social element of the chatbot medium by using information from previous conversations to make new and better recommendations.

SAMPLE DIALOGS

New User

i'd like thai food near university of washington

How about Amazing Thai Cuisine? They have 433 reviews and their rating is 4. It is 0.8 mi away and it takes 17 mins to walk there or 5 mins to drive there. Do you need more infomation about this place?

no next place

How about Little Thai Restaurant? They have 301 reviews and their rating is 4. It is 0.3 mi away and it takes 8 mins to walk there or 3 mins to drive there. Do you need more infomation about this place?

no next

How about Thai Tom? They have 1878 reviews and their rating is 3. It is 0.7 mi away and it takes 15 mins to walk there or 6 mins to drive there. Do you need more infomation about this place?

actually first one

What else do you want to know about Amazing
Thai Cuisine

what are their opening hours

They open until 22:00 today.

awesome thanks

Returning User

Welcome back! What did you think of the last place that I recommended?

I liked it a lot

Great, how about Lando's Grill? A lot of people like both places, and it has 5 stars from 800 reviews, and is 1.2 miles or a 20 minute walk away from your work.

Do you want more information about it?

What's their address?

111 Cloud City, Outer Rim, Bespin.

Cool, thanks!

TARGET AUDIENCE

People at home with a device, in a relatively urban environment

- Unable or unwilling to open and manually filter Yelp to find food open now
- Planning a trip but not a local an area, in future
- Local to the area but planning something special for someone coming to visit, in future
- Planning something for groups, in future
- Busy and looking for a place to order takeout, now

SYSTEM ARCHITECTURE

ASR & TTS

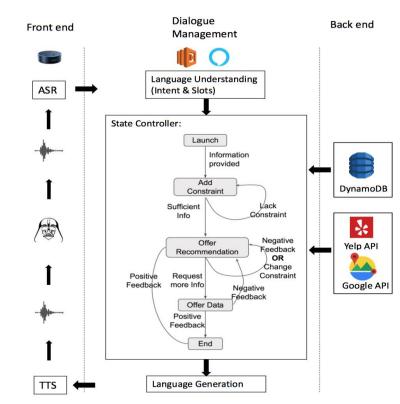
Using Alexa Skill Kit

Dialogue Management

Alexa Skill Kit & AWS Lambda

Database & API

- DynamoDB: store user information
- Yelp API: provide restaurant information
- Google Maps API: provide travel times



DIALOG FLOW STATE MACHINE

Launch: Welcome to Mos Eisley Cantina. Looks like you're new. Let's set some default locations for looking up restaurants in future. You can set home and or work, by address, zip, or both.

Secondary Launch: Welcome back to Mos Eisley Cantina. How did you like our last recommendation

Add Constraint: Where would you like me to look? You can tell me the 5 digit zipcode or your address.

Offer Recommendation: Bahn Thai Restaurant may be a great choice for you. Their rating is 4 and they have 356 reviews. They have a moderate price. You can ask me to find a fancy one or ask me for more information about this place.

Offer Data: Their phone number is (206) 283-0444.

End: Thank you for trying the Mos Eisley Cantina. We hope you enjoy your meal. Be sure to tell us what you've thought of it next time we chat! Have a nice day!



Yelp Fusion:

- Parameters: location, keyword, radius, price, open_now, open_at
- Returns: address, rate, opening_hours, phone_number, reviews

Google Maps:

- For transportation information
- returns the time for walking, driving and by bus

DynamoDB:

- UserInfo: save user profile
- Previous Recommendations: save previous recommendations

EVALUATION METRICS

Evaluation for a social bot is complex - fewer turns isn't necessarily better (as with a goal-oriented bot).

Metrics:

- Ratio: Success to Failure
- Ratio: Errors to number of turns
- Qualitative: Explicit user feedback on recommendation quality

Success: exits only after being made recommendation

Errors: incorrectly recognized intents, unrecognized utterances, negative/frustrated user utterances

LIMITATIONS

Alexa Skills Kit works very well for adding light conversational functionality to an existing app. But for a full conversational bot:

- full utterance cannot be captured
- single word utterances (a very high % of our conversations) are unreliably recognized
- black-box Intent classification
- lack of debugging suite
- difficulties in sharing a codebase across accounts

FUTURE WORK

- Confirmations: A/B testing on when it is helpful and when it is annoying to have confirmations, ex) "Your zip code is 98105, is that correct?"
- Proactive recommendations: leverage user behavioral similarity and platform trends to make recommendations before a user asks.
- Inferred constraints: if a user always wants good for groups, or vegetarian, or always like a certain type of restaurant, make recommendations without requiring user to explicitly state constraints

DEMONSTRATION