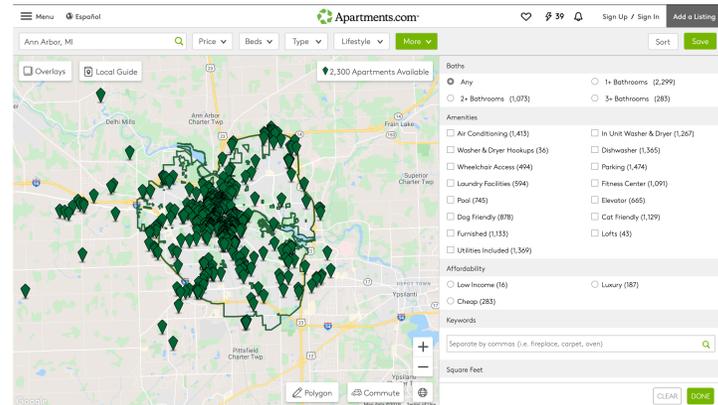


Background

Students at the University of Michigan in CSE may take EECS 498: Conversational Artificial Intelligence (AI) as their senior design project course. Students in the class use the Clinc AI platform to build a chat bot that solves a real-world problem.

University of Michigan students struggle to find satisfactory leases in the Ann Arbor housing market. Many students, especially those who have only lived in dorms, are new to the housing market and do not know where to begin looking. Students may find sites such as Apartments.com or Zillow helpful, however these sites have complex menu systems and require the user to know what they are looking for.



[apartments.com]

48,000 students enrolled¹
70% live off campus²
33,600 need housing each year

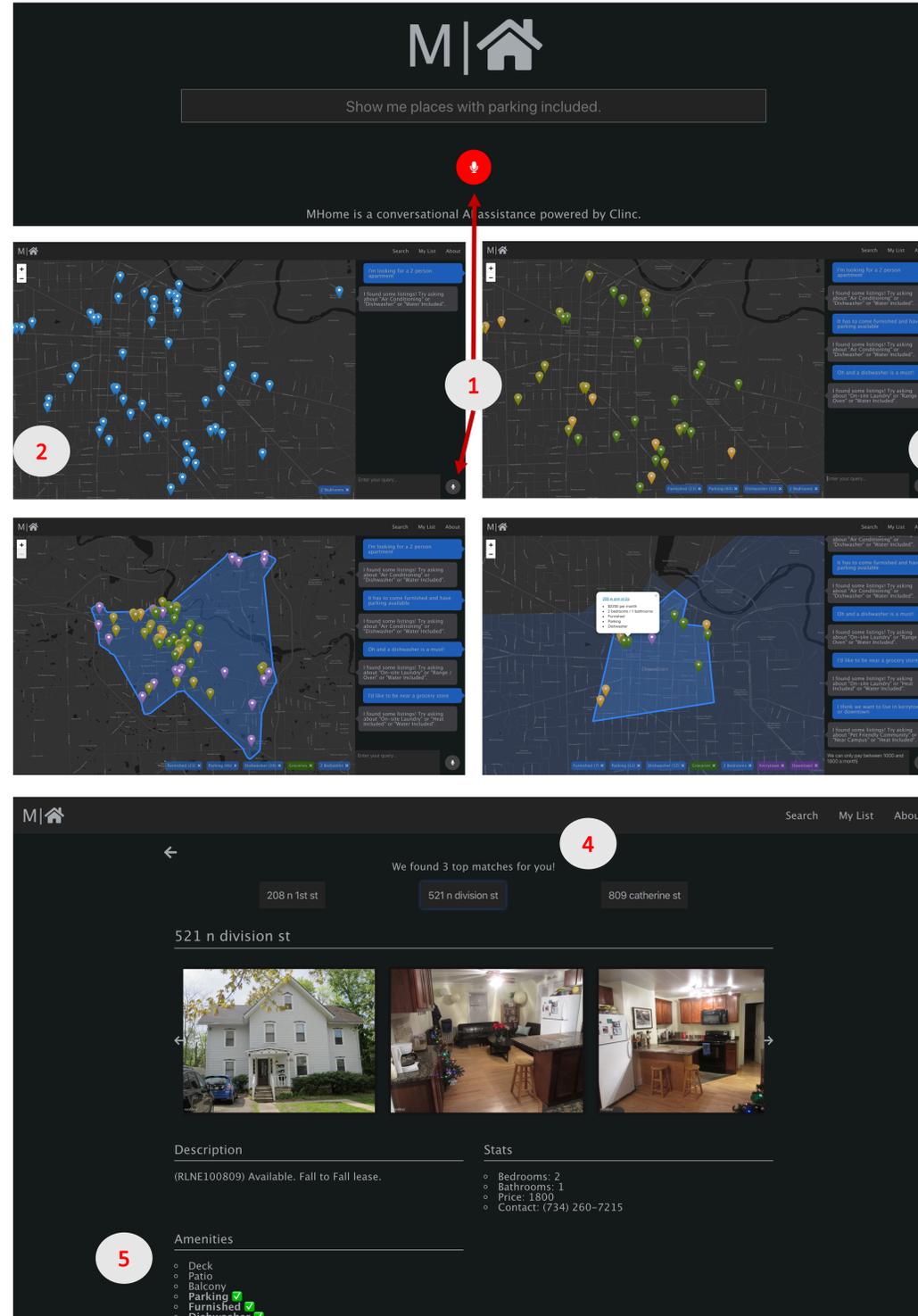
Data Collection

Listings

The housing database is the backbone of the project. Significant time and resources were put into scraping listings from abodo.com. The resulting database contains 679 listings with 137 unique amenities. Additionally, 190 points of interest were added.

Utterances

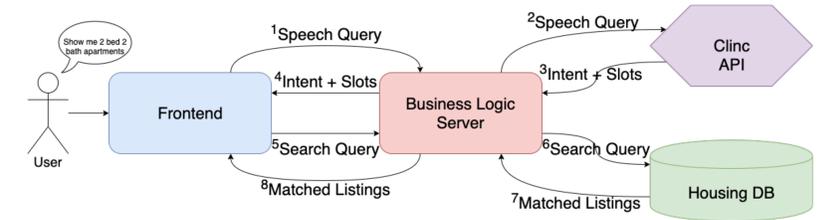
The Clinc AI models need lots of data to be trained on. To generate a representative dataset of utterances, the crowdsourcing platform Amazon Mechanical Turk (MTurk) was used. Over 500 unique utterances were collected and cleaned.



Key Features

1. Speech to Text & Natural Language Recognition
2. Map view of Apartments
3. Search by Price Range, Number of Bed & Bath, Amenities, Neighborhood, Point of Interest
4. Top Matches Recommendation
5. Details View of Apartment

Service Architecture

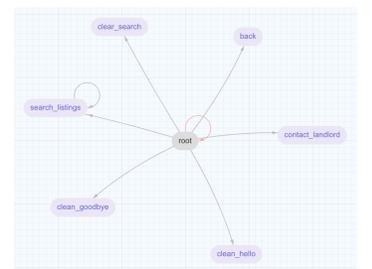


Clinc AI Models

The Clinc API uses AI models to understand the queries submitted by a user. Each query undergoes a three-step process to extract relevant information in a standard format which is used to search the housing database.

1. State Graph

The state graph guides the conversation. Each user utterance is classified by a neural network model to determine which state the conversation moves to next.



2. Slot Value Pairing

I'm looking for a **four** **bedroom** **two** **bathroom** apartment in the **downtown** area. I'd prefer a place that offers **parking** and has its own **fitness center**. I also have a **dog** so I'd like to be **near** a **park**. Oh and my budget is tight so it needs to be **under \$500** a month!

Next, key words or phrases, associated with the current state, are extracted from the customer input by the Slot-Value Pairing (SVP) engine.

3. Slot Mapping

Finally, the extracted Slot-Value Pairs need to be mapped to the correct database items. Slot Mapping (SM) engine map extracted values based on several techniques including: token and fuzzy string matching.

¹University of Michigan, Office of the Registrar ro.umich.edu/reports/enrollment

²US News <https://www.usnews.com/best-colleges/university-of-michigan-ann-arbor-9092/student-life>