CUCUI

a conversational user interface
for
group food order

Interaction Design Studio I: Section C
Assignment 3: Conversational User Interface
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Grace Guo, Jiyuan Li, Saloni Saxena

Purpose & Design Goals

In recent years, conversational user interfaces (CUIs) have been rising in popularity and functionality. Products like the Amazon Echo and Google Home have given us the ability to have a conversation with a computer, while leaving our hands free to complete other tasks. As designers, our mission is to construct these conversations themselves, to feel natural, flowing, and technologically possible. With so many areas for innovation, our team has chosen to tap into the food delivery industry. We want our CUI to make ordering food easy, especially with a large group of people.

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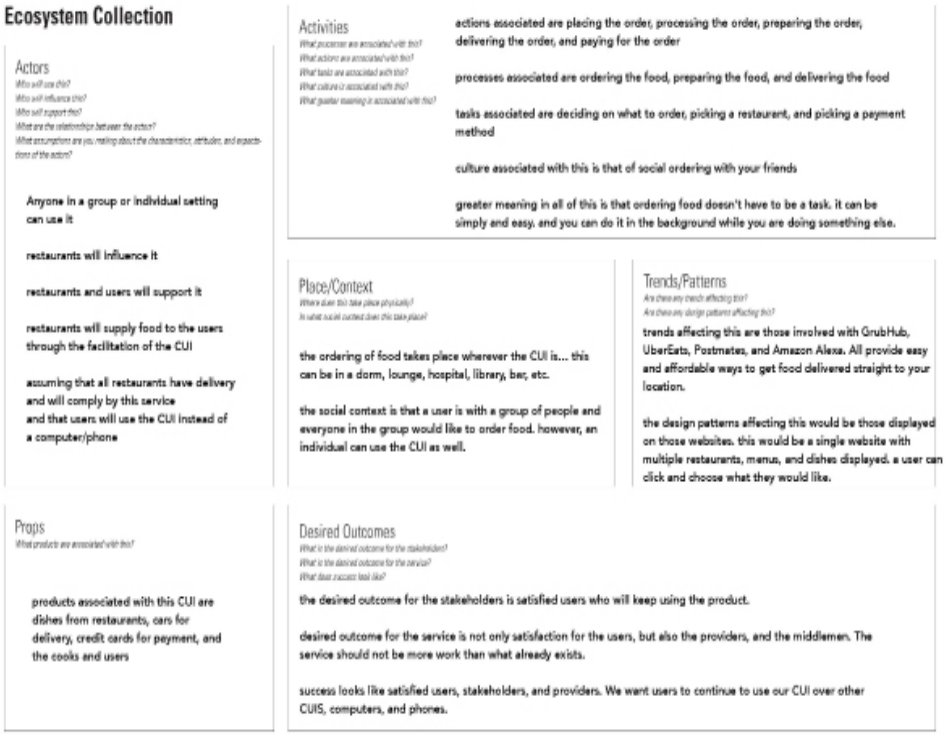
Premise

Our task for this assignment was to design a CUI targeted toward an untapped domain. The goal was to find a problem in the domain and fill it with the features of the CUI. We considered pre-attention, attention, intent, utterance, response, and error recovery when modeling conversation between as user and the CUI.

Understanding the Context

We started our research by creating an ecosystem collection map for the meal-ordering space, to better understand our context. We mapped out the processes, materials, and actors involved in meal-ordering, as well as the trends/patterns prevalent today. From this, we learned that meal-ordering is typically a social experience, as people usually order food with other people.



Finding a Gap

We then created a feature matrix with the CUIs used by Domino's, Amazon Echo, Google Assistant, Tmall Genie, and McDonald's in respect to ordering food. A green check signifies that the platform has this feature, while a red x signifies that it doesn't. If we couldn't find information, we left it blank. We highlighted interesting gaps in blue. These features are not found uniformly across platforms and can be useful in our CUI. Most CUI platforms have the basic food ordering capabilities. We saw a gap in the areas of budgeting, smart recommendations, and social orders. In terms of college culture, we like to order food easily with our friends. However, sometimes it is hard to find food in our small budgets, and good food in the area based on all of our individual different preferences. Our vision is to fill in these gaps. We want our CUI to be convenient and useful for all users; individuals and those in a group setting.

	Domino's	Amazon Echo	Google Assistant	Tmall Genie	McDonald Messeng
Show Menu	✓	✓	✓	x	✓
Check Out	✓	✓	✓	✓	✓
View Cart	✓	✓	✓	✓	✓
Edit Order	✓	✓	✓	✓	✓
Status of Order		✓	✓	x	✓
Reorder saved Order		✓	✓	✓	x
Social Orders		x	x	x	x
Special Orders	✓	✓	x	x	x
Answering questions about food	x	✓	✓	✓	✓
Help on how to use the interface	✓	✓	✓	✓	✓
Recommendations	✓	✓	✓	✓	✓
Identity Verification	x	✓	✓	✓	x
Smart Recommendation out of ambiguous instruction	x	✓	✓	x	x
Complaints	x	x	x	x	✓
Apply Coupons	✓	x	x	x	✓
Cancel Order	x	✓	✓	✓	✓
Personality	✓	✓	✓	x	x
Budgeting	x	x	x	✓	x

Ideation: Creating Scenarios

We started our ideation by creating 10 usage scenarios of our CUI, showcased below.

A group of friends is holding a study group for a big exam tomorrow. It is getting late and they would like to order dinner together. However, they don't have the time to go out and get food, and can't even decide on a restaurant. They ask the CUI to smart recommend a restaurant based on their various preferences. The CUI then facilitates the ordering of food for the entire group and easily allows them to split the bill so they don't have to spend time haggling over who owes who money.

Alice is getting herself and her kids ready for the day in the morning. She juggles all of her many tasks while also worrying about the kids' lunches. Already running late, the CUI helps her order her kids' lunches while she is driving them to school. The CUI allows her to match food to her kids' preferences and sets up a delivery straight to their school.

Andrea has ordered many times on CUI for food from local restaurants. CUI has the order history. She feels like trying something new today. She still wants something from the neighborhood. She talks to CUI:"I want something new from local restaurants." CUI goes through her history and compares it with the local restaurant list. CUI:"I found 10 new restaurants. Would you like to know about all of them?" Andrea only wants to eat at restaurants with 4-star ratings or more. Andrea:"Show me the ones with at least 4-star ratings." CUI:"Here's the restaurants: A, B, C." Andrea:"Show me the menu of A."

Kelly ordered on CUI on Wednesday and CUI has the order history. A few days after, Kelly wants to order something again from CUI. She likes the food she had a couple days before but couldn't remember which restaurant she ordered from or on which day she ordered. The only thing she remembers is that she had chicken curry. She talks to CUI:"I ordered something close to chicken curry this week, do you remember what was that from?" CUI: "Let me look at your order history. It seems like you ordered Chicken Curry Rice from Jasmine Tea Cafe on Wednesday. Is that what you are looking for?" The restaurant sounds familiar to Kelly. This is the one she ordered. Kelly: "Yes, order that again."

Roger has a fixed schedule. He has one class at noon at ETC and one class in the evening at 3SC. He has classes only on Tuesday and Thursday. He likes to order food for the week on Mondays so that he won't forget ordering. Roger talks to CUI:"I want to schedule deliveries." As prompted by CUI, he then tells CUI to order from different restaurants for lunch and dinner, and deliver to two locations, and repeat on Tuesday and Thursday.

Alice is throwing a party for a large group of people and needs to order some dishes to serve to the group. However, as the host, she does not want to leave her party for too long. She asks the CUI to curate a selection of entrees, appetizers, and desserts, to deliver straight to her apartment. When the food runs out, she does the same thing.

Ideation: Creating Scenarios

Adam got his first developer job at Google starting September. By the end of the first month, he received his first salary paycheck, and he decided to treat himself to a really fine dinner. He asks the cui to recommend decent place for dinner. Cui gives him several options and books him a spot at the place he chooses. And Cui also briefs Adam about the special cuisine he is going to enjoy.

Lucy goes for a run. She is on diet and does not want to spend much on supper. She calls out to Apple Watch, “Siri, find me something to eat under $10.” Siri responds,”No problem, searching for post-run refreshment under $10. ” A couple of seconds later, Siri responds, “Beets Salad at a nearby Element Fresh, $9,99, want me to show you the way?” Lucy says,”Excellent!”. Siri then leads Lucy to Element Fresh. She picks up her salad at the reception and runs home.

Laura just moved to a new neighborhood and she wants to explore the local food scene. She finds the reviews on Yelp long winded and not helpful. She also finds it inconvenient to compare different restaurants based on those reviews - she wants to hear about other’s opinion but does not want to be too analytical. She asks the CUI to play some of those recorded reviews from other local users. Based off the reviews she relates to, she decides on the food she want to get.

Sam is having a fever, he has a sore throat and a runny nose . He hasn’t been eating for a whole day and now he is very hungry. He asks CUI to order him something suitable for his condition. CUI makes recommendations and takes orders. WThe restaurant receives a special order, with the diner’s health condition. Besides getting rid WWof the spinach, the chef decides to put less MSG and salt to make the porridge more suitable for the patient.

Experience Prototyping

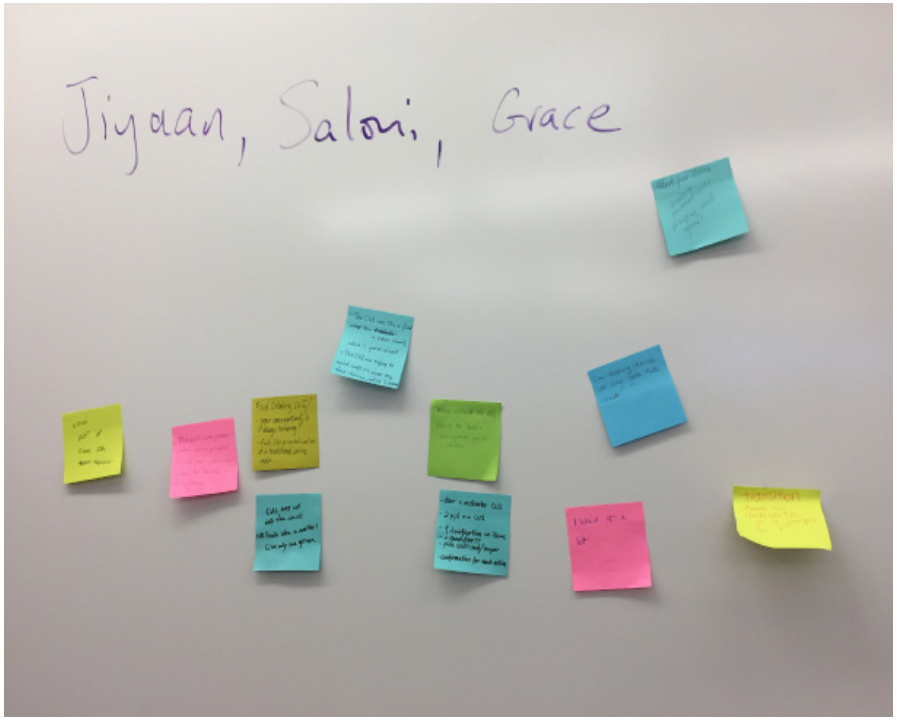
We chose the group order scenario from the brainstorm session to bring to the experience prototyping session. Another group acted out our scenario and we got feedback from the audience.
Some of the most insightful feedbacks are:

1. “Visual point of focus for people talking”.

2. “Cui feels like a waiter?”

3. “Hands free ideas: playing card game?”

We took these feedbacks into consideration when modeling the conversation flow and making storyboard.



Modeling our Conversation

After understanding our feedback, we had a good idea of how to design our conversation, and started to create an utterance model for our CUI. We mapped out the user's intent and utterance as well as how the CUI would respond. We also considered the CUI's pre-attentive and attentive state when interacting with the user. From this model, we were able to create a script for our sceanrio.

Intent	Utterance	Response
Start group ordering	Group order	Yes, [name]. Who am I serving today?
Start group ordering	Ordering for group	Yes, [name]. Who are in the group?
Start group ordering	Order food for us	Sure, [name]. Who am I serving today?
Establish Group Profile	[name]	Awesome, we have [name]. Is that right?
Establish Group Profile	[name] here	So we have [name]. What would everyone like?
Establish Group Profile	It's [name]	Ok, we have [name]. What would everyone like?
Swap Order	Can I get [food] instead?	Of course. [food] instead.
Swap Order	Get me the same thing as [name]	Ok. So [number of food] [food].
Swap Order	I don't want [food] anymore	No problem. Deleting [food]
Search User History	What was [food] from?	[food] was from [restaurant]
Search User History	Which restaurant did I get [food] from?	It was from [restaurant].
Search User History	Do you remember when I got [food] from?	Yes. It was from [restaurant].
Order Food	I'll get [food] from [restaurant]	Ok. one [food] from [restaurant]. Anything else?
Order Food	Can you get me [food]?	Of course. [food] Is that it?
Order Food	Get me [food] from [restaurant]	Sure. [food]. Anything else?
Special Request	I want [food] with [special request]	[food] with [special request]?
Special Request	Can I get [food] with [special request]	Okay. [special request]
Special Request	I'll get [food] but with [special request]	Sure. [food] with [special request]
Recommendation	Can you recommend something [criteria]?	Seems like [restaurant] has a good rating, and [food] is popular.
Recommendation	Is there anything [criteria]?	I found [food] for you. From [restaurant] that has a good rating.
Recommendation	I'd prefer [criteria] food.	You may like [food] from [restaurant] there! It is a popular dish for just $10!

Designing Error Recovery

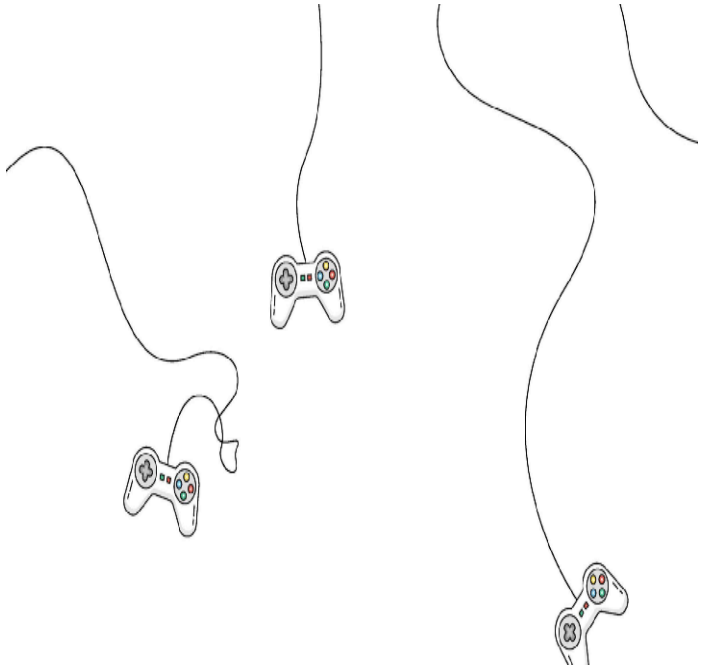
We also considered how our CUI dealt with making errors.

First Error: Wrong Intent Triggered
In the first error, the user wants something with a special request, however the CUI thinks the user wants just the standard version. So the CUI's standard order intents is triggered instead of the special order intents. After the user reconfirms her request, the CUI understands and recovers from error by triggering the right intent.

Second Error: Mishearing Error
In the second error, the user says things to specify an action parameter of one intent, the CUI mishears the user and assigns the wrong parameter value. After the user reconfirms the right parameter, the CUI changes the value of the parameter from the wrong one to the rignt one. In our case, it could be that the user wanted garlic sauce on top but the CUI made it mushroom sauce.

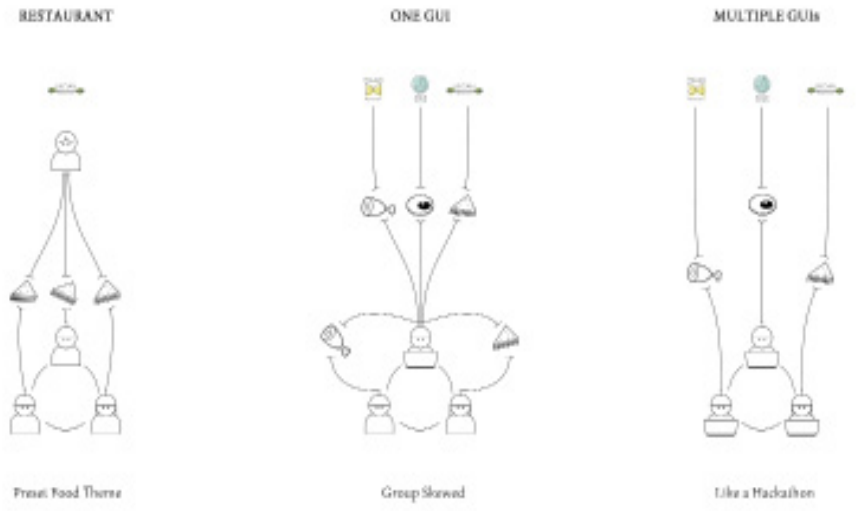
Final Scenario

In the final scenario, we are depicting a group of gamers who are occupied with a mentally heavy game. The group is on a streaming marathon and has been playing for 8 hours straight. It's almost dinner time and they are thinking about eating something quick yet decent. They are so focused on the game that they can't break away from it to order food. They ask CUCUI to order food for the whole group. While focusing on the game, the group expresses their personal preferences to CUCUI and gets food from multiple restaurants through the help of CUCUI.



Design Goals

We looked at three of the most common models of social food experience. The restaurant fosters great group conversations. But the food theme is preset, and options are limited. The two gui scenarios provide optionality at the expense of group experience. In the one Gui scenario, one group member is in charge of the graphical user interface, and also overloaded with the waiter's role, conversations become highly directional and monotonic. Group experience is greatly affected. In the multiple Guis scenarios, each group member is in charge of a gui, with or without interactions with the other group members. This is more like the structure you would observe in a hackathon team. Because of the waiter is absent in both gui scenarios, the group experience becomes more task driven and strategic, the group members are preoccupied with the mechanics of the gui interaction and this is not an intuitive way to articulate desires.



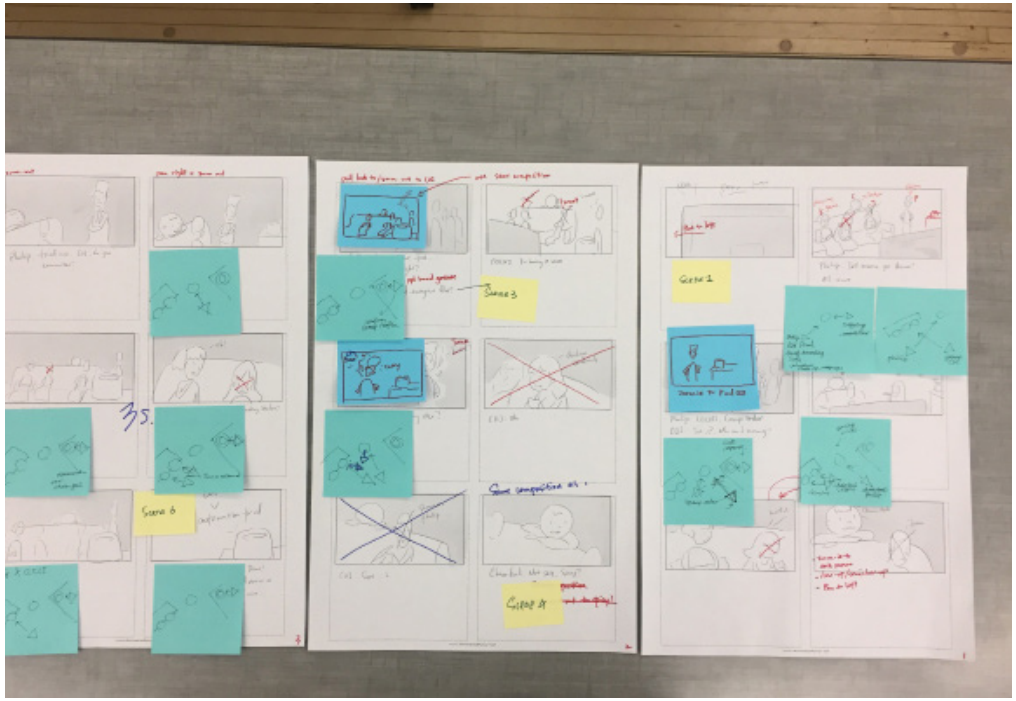
Design Goals

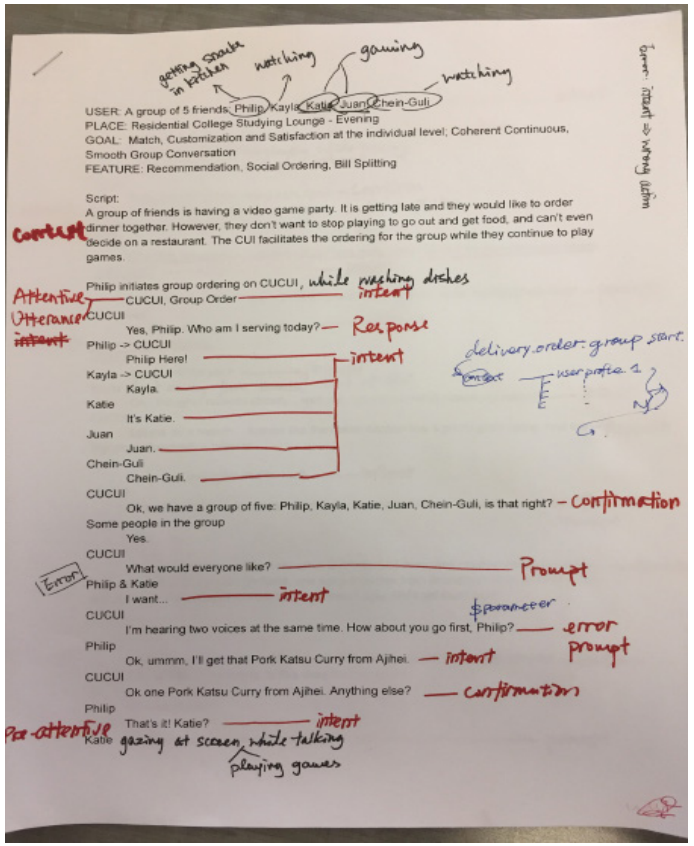
What we are trying to do is to keep the waiter as a crucial social analog yet upgrade him to a more versatile and powerful agent that is able to finesse the links between myriad idiosyncratic demands and the vast food landscape. The CUI will be able to recognize the specific voices of its users who have created a profile. This will allow the CUI to know who is talking so the CUI can easily differentiate between multiple users and orders. The CUI will be able to recognize when multiple voices are speaking, and in turn will be able to guide the users to speak one at a time. Additionally, the CUI will be able to understand when someone in the group order hasn't placed their order. Users will be able to duplicate orders with the CUI, as in if one user would like to mimic the order of another user, the CUI will be able to understand this action. Similarly, the CUI will be able to remember each user's past orders and re-place the same order. The CUI will be able to recommend restaurants and dishes based on ratings and user preferences. The CUI will also also user's to split the bill easily if they are ordering from the same restaurant and will easily individually charge each user if there are separate orders. These calculations will include tax, tip, and delivery. The CUI will simply charge the saved credit cards of users with a profile and allow new users to create a profile. Additionally, the CUI will organize delivery so that all orders are delivered within the same time frame so all users can enjoy their food at the same time.

Bringing our Concept to Life

With our script in hand, we started to sketch out our vision for our video.
We decided that the original setup with five people might be a little too redundant. So we got rid of two characters and generic conversations. We then consolidated feature specific conversations into the three remaining characters. Shot diagrams were added on top of corresponding scenes. Two cameras were used in the shooting, with one focused on the gamers and the other on CUCUI. We also invited two friends from another group, Chongrui and Esther, to be our actors. The scene was set up at Grace's apartment.

Bringing our Concept to Life





Dealing with these changes required us to revisit our scripts and storyboards.

Adding the Final Touches

After creating a rough cut of the video, there was still a lot of room for improvement. We received feedback that the original young boy voice that we chose for CUCUI did not mesh well with the video. There were also some inconsistencies in CUCUI's dialogue that needed re-visiting. In some cases CUCUI was very polite, and in others, he was more informal. He also spent a lot of time confirming statements made by the user, that perhaps weren't necessary. We realized that too many confirmations can make the user feel aware that they are talking to a machine rather than another human. If CUCUI did in fact make a mistake, the user could always interject and correct him. Another important point brought up was that CUCUI lacked any attentive feedback. There was no indication to the user that CUCUI was listening. Responding to this feedback, we went back to CUCUI's utterance model and changed many of his responses. We also picked a new male voice that better suited the context and added a foley to indicate his attentive state. These changes really sharpened the video

and better represented our concept

Video can be seen at: https://www.youtube.com/watch?v=p_nyheh2zeo&feature=youtu.be

Reflections

Our team faced a few challenges throughout this assignment. For one, we had to learn how to compromise. With us each having different ideas and varying levels of experience, we often found ourselves disagreeing. However, after working through each idea, we always came up with an agreed upon solution.

Additionally, our team had to cut down many parts of our scenario due to lack of actors and time, and in turn the vision that we had mapped out didn't get fully executed. However, this taught us to work with the footage that we did have and create a concept video that we are proud of.

We would like to thank Ellen for her guidance throughout this project and our classmates for their constructive suggestions and feedback.