

Say Hello!

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Outline

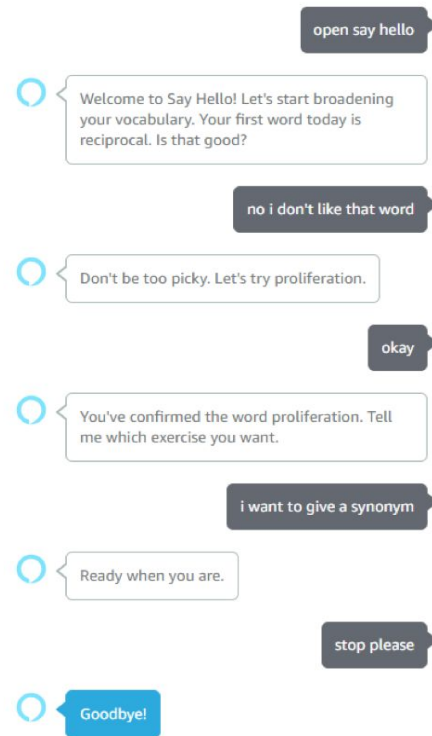
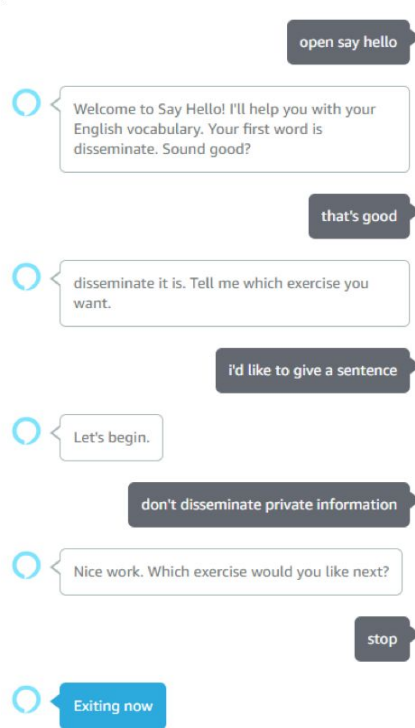
- Introduction
- System Architecture
 - Database
 - Interaction Model
 - Conversation State Machine
 - Verification Model
- Challenges and Future Work

Motivation

- Learning a new language is challenging
- A more natural way to learn a new language and memorize vocabulary: through speaking and using
- Goal is to help users build and train English vocabulary through exercises and improve speaking skills through conversational flows
- Target users: students preparing for TOEFL exam

User Experience

- Words randomly selected
- User practices with exercises: definitions, synonyms and example sentences
- Answer verification module to provide immediate feedback



Database

- DynamoDB database implemented with Boto3 (AWS SDK for python)

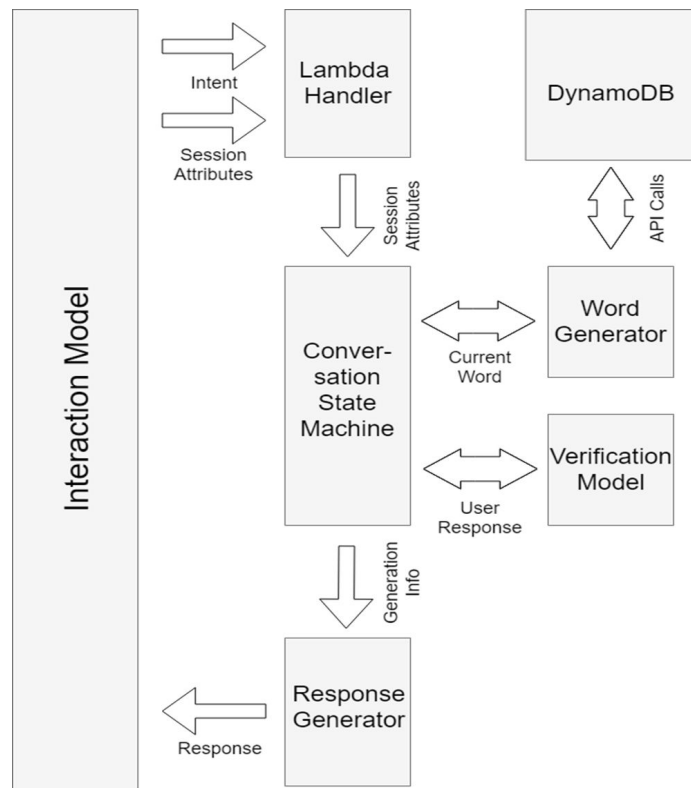
index	word
0	supplant
1	disseminate
2	reciprocal
3	stereotype
4	conspicuous
...	...

word	info
supplant	{‘syn’:[replace, override, ...], ‘def’:[...], ‘exa’:[...]}
disseminate	{‘syn’:[scatter, disperse, ...], ‘def’:[...], ‘exa’:[...]}
reciprocal	{‘syn’:[mutual, shared, ...], ‘def’:[...], ‘exa’:[...]}
stereotype	{‘syn’:[standard, pattern, ...], ‘def’:[...], ‘exa’:[...]}
conspicuous	{‘syn’:[obvious, clear, ...], ‘def’:[...], ‘exa’:[...]}
...	...

user	words
‘amzn1.ask.account.AGZW...’	[supplant, reciprocal, ...]
‘amzn1.ask.account.AHL3...’	[stereotype, conspicuous, ...]
‘amzn1.ask.account.AYNZ...’	[supplant]
‘amzn1.ask.account.APQN...’	[disseminate, ...]
‘amzn1.ask.account.ARTC...’	[conspicuous]
...	...

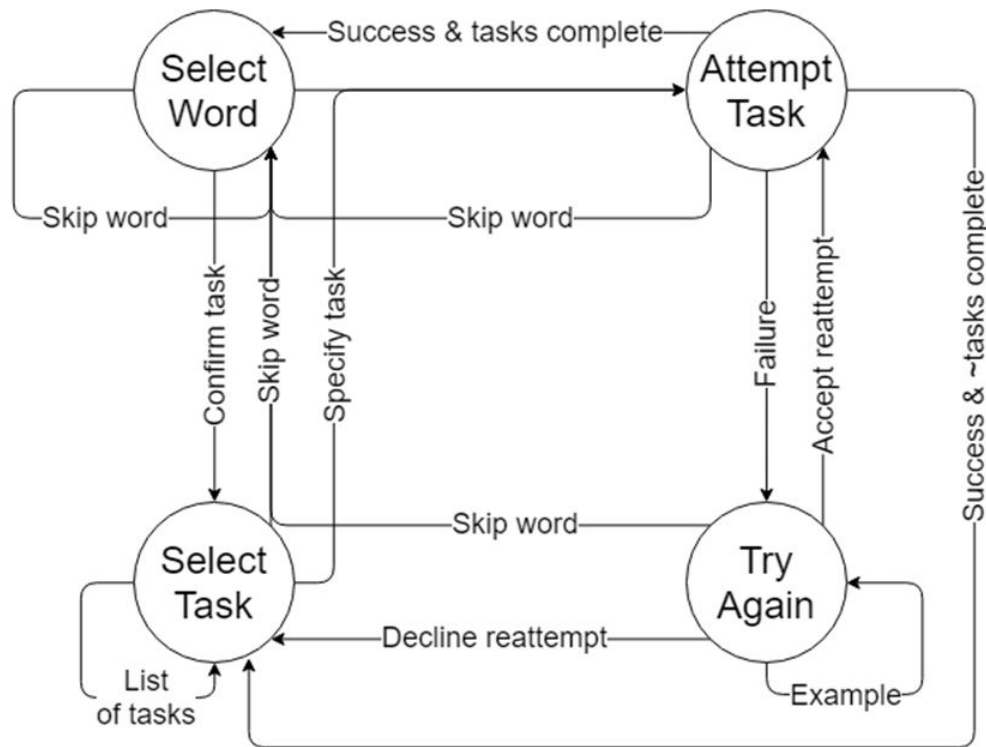
System Architecture

- Calls to lambda are handled in Lambda Handler
- State is reinitialized each call from Session Attributes passed w/ Lambda
- FSM communicates with modules, generates data
- Response Generator uses data from FSM to generate response



Conversation State Machine

- Input
 - User utterance
- State variables
 - Current word
 - Current exercise
 - Attempt history
 - Verification result
- Output
 - System response



Interaction Model

I want to practice synonyms
I want to use it in a sentence

Another exercise
Skip this exercise please

The meaning of supplant
is to replace

Built-in Intents	Custom Intents
cancel	Skip word
help	Give an example answer
stop	What are the tasks
no	Specifying a task
yes	Giving an answer to verify
	Go to next task
	Agreeing to try again

I don't like this word
Next word
Skip this word

Can you tell me the
answer?
I need an example
I have no idea

What are the exercises?
Not sure what to choose

Verification Model

- Synonym: search through the synonym dictionary
- Definition: capture semantic features and calculate cosine similarity (API: Dandelion)
- Sentence: capture lexical features (API: TEXTGears)

Task: synonym
+ user input



1. Key-word match

Task: definition
+ user input



1. Sentence similarity

Task: sentence
+ user input



1. Include the key word
2. Grammar check

Challenges

- Interaction Model
 - Exercise response caught spurious intents
 - All single-word intents would lump
- Verification Model:
 - Official corpora: TOEFL words have limited data
 - Paraphrase identification
 - Grammar check: capture syntactic and lexical features

Member Tasks

- Xiaopei -- Interaction Model
- Mohamad -- Database
- Qihan -- Verification Model
- Dustin -- System architecture, Dialogue Manager
- Harita -- System testing