Project Report: YeBot

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COSC 310 - Software Engineering

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1.0 Introduction

YeBot is an interactive conversational agent that allows an individual to hold a conversation of more than 30 turns. The agent in this case is a celebrity and the user can be any individual. The chosen celebirty for this bot is Kanye West. The conversation that takes place is primarily question and answer based. However, there may be certain specific responses for some non-question statements. The responses from the chat agent is a collection of Kanye's social media posts, songs, and interviews.

2.0 Programmed Features

The interactive conversational agent has several features implemented as well as future areas of growth. As seen by the read.me file where the list of features to implement in the future can be found. Currently YeBot contains the following programmed features.

2.1 GUI

Yebot has a simple GUI so that a user can have an easier experience with the bot, the GUI also shows a recent conversation history. The first version of the GUI was implemented in A2. However, improvements were made to this feature. This included aesthetic preferences, ability to change the chat box size, as well as removal of a tiny window that popped up along with the conversational window. For aesthetic preferences the colours were set to have a dark mode with charcoal background and white fonts. The chat box now has a minimize and maximize function as well as the ability to resize to a preferred sizing. A line of code was removed to remove the tiny window that was popping up during the running of YeBot.

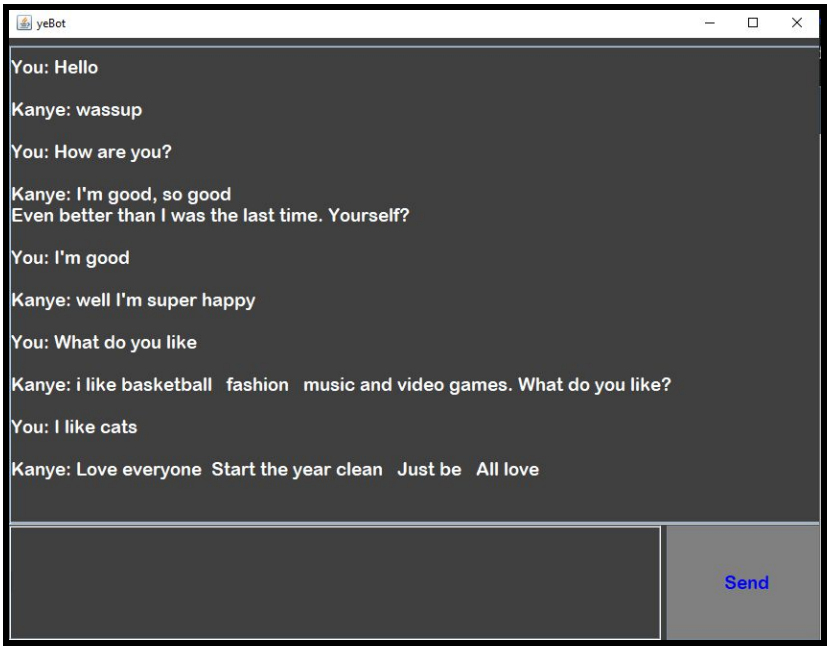

Figure 1: YeBot GUI

2.2 Topics

YeBot is based off of the celebrity Kanye West who has a very unique and controversial personality. For the topics and general personality of the bot references from social media posts (like twitter), interviews, as well as songs were used to pick topics and hold general conversation. These general conversations have Kanye talking about himself, his family, his personal interests, the president of USA, as well as his favourite colour.

2.3 Default Responses

Yebot has several default responses for when he doesn't know a direct answer. The reasonable responses include:

- "Wish I could help I dont know what that means"
- "You got good vibes but I dont know what to say to that"
- "Yo man you gotta slow down maybe try say it in a different way"
- "That aint something im knowledgeable on maybe say it ina different way"
- "Could you say it in a different way I may just not know what youre on about"

On top of this POS tagging was also used to give some basic responses which I will go into detail further in the next section Language toolkit.

2.4. Language ToolKits

A WordNet for synonym recognition, OpenNLP POS tagging and Named Entity Recognition were the language toolkits used in YeBot. They use an API and the other uses a NLP library. Together all three work together to provide a better flow to the conversation.

2.4.1 Synonym Recognition

Synonym recognition was used to recognize synonyms in the AIML file to be able to provide a response to an individual if they used a synonym and not the direct word that was in the AIML file. For example in our AIML we have a response for "I hate you" but with the synonym recognition we can still respond with the "I hate you" response even if the user says "I detest you". This was done using the Princeton and jaws system for a WordNet.This allows Yebot to take in even more sentences even with his limited AIML options.

2.4.2 POS Tagging

POS tagging was used to develop more default responses that were related to the user's input information. For example if YeBot does not know what the user is talking about before giving one of the five default responses, POS tagging will be used. The tagging will indicate several things that can be used to make general responses to the individual. For example if the users sentence included a noun he can now generally respond with a lack of knowledge on the topic.

2.4.3 Named Entity Recognition

YeBot is able to recognize names for people, places, and other entities. With this we are able to pull this information to give a generic results to named entities. For example we could mention to YeBot “Do you know John?” and he could respond with “I have not heard of John”. This allows YeBot to keep the conversation going without diverting to the default responses.

3.0 DFD

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The data-flow diagram is used to represent the flow of our system. It also shows the input and outputs of each system.

3.1 DFD Level 0

DFD at level 0 contains only one process therefore we will be looking at YeBot from broad perspective in this portion. YeBot when ran waits for a user to provide an input message. Compares it to its AIML files then based on the information it finds provides the individual with an output message.

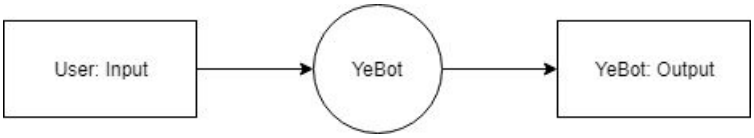


Figure 2: DFD Level 0

3.2 DFD Level 1

Below is a DFD level 1 of our interactive conversational agent. It starts with a user running the program then they have to type an input response to YeBot. That message goes to the YeBot.java file where it then looks through our AIML and Language toolkits to decide on the best response. From there a response is chosen and sent back to YeBot to be forwarded to the conversation.java. This then sends it to the graphical user interface java file BDialog.java where the response to the user is printed.

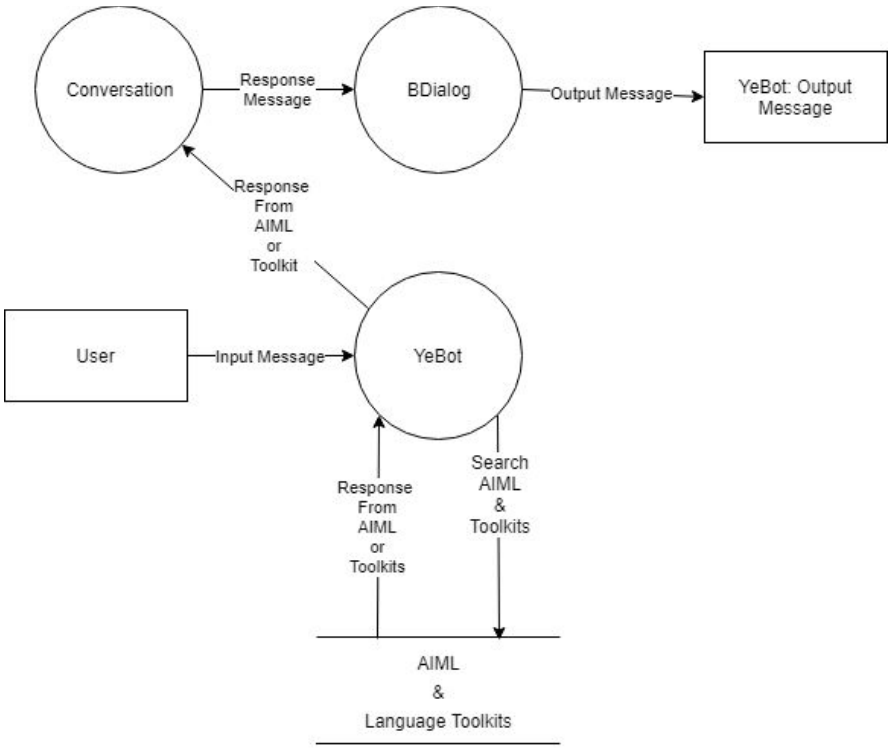


Figure 3: DFD Level 1

4.0 GitHub Repository

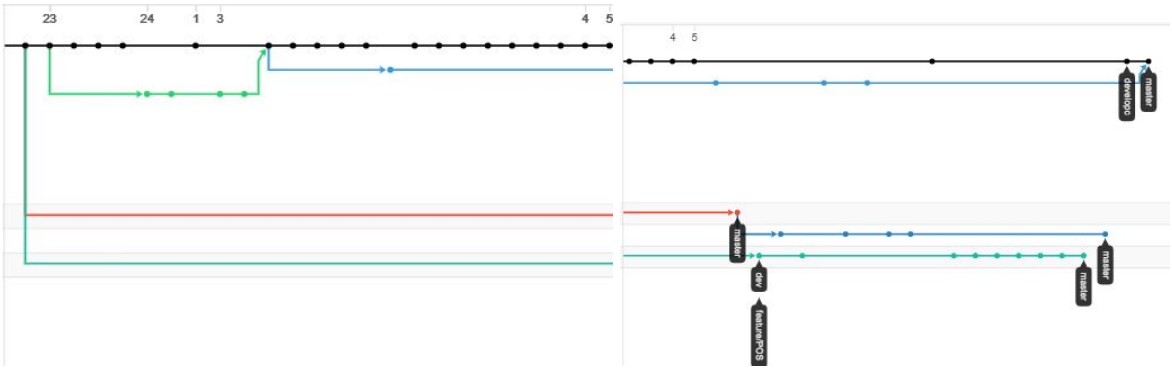
Repository: https://github.com/CourtneyGosselin/InteractiveConversationalAgent

Branching: https://github.com/CourtneyGosselin/InteractiveConversationalAgent/network

Commits developc:
https://github.com/CourtneyGosselin/InteractiveConversationalAgent/commits/developc

Commits master:
https://github.com/CourtneyGosselin/InteractiveConversationalAgent/commits/master

When it came to this version of the project I decided to start working on a new branch (developc). Which is where I implemented all the programmed features mentioned above as well as all of my commits were made on this branch. Merging was made onto master.



5.0 Dialogue Sample

The following sections of this document show the programmed features of YeBot as well as the limitations and default responses.

5.1 Dialogue

The following images show sample output of 30 back and forth conversations. Showing the synonym recognition when someone says “I detest you” it finds our saved “I hate you” and gives the response. The POS Tagging is represented when an individual has a noun in their message and kanye does not have a pre planned response he will say “I ain’t know nothing about NOUN”.

Kanye: Ye is in the BUILDING!

You: Hello

Kanye: wassup

You: How are you?

Kanye: I'm good, so good
Even better than I was the last time. Yourself?

You: I'm good

Kanye: well I'm super happy

You: What do you like?

Kanye: i like basketball fashion music and video games. What do you like?

You: I like dogs

Kanye: Love everyone Start the year clean Just be All love

You: Do you like sports?

Kanye: I like basketball I wanna make uniforms for my high school basketball team through brand Yeezy

You: Are you married

Kanye: @KimKardashian our love story is like a love story for all the ages when we first got together it was like Romeo and Juliet kind of thing where its like shes a reality star and im a rapper who do you love

You: How many kids do you have

Kanye: my kids are the center of my love i would like to have seven if kim does

You: Are you religious

Kanye: Trust God bro God sees all Stop the act Cut the program

You: Who are you voting for

Kanye: Trump all day

You: Who is your favourite artist

Kanye: I'm my favourite rapper

You: Tell me a joke

Kanye: I could never do stand up cause I tell jokes better when I'm sitting

You: Will you run for president

Kanye: It's gonna be 2024 now, but when I decide to do it, it will be done.

You: What upsets you

Kanye: Sometimes I get emotional over fonts

You: Whats your favorite color

Kanye: Red, yourself?

You: blue

Figure 4: Yebot Sample Dialogue

5.2 Dialogue Limitations

If it isn't caught in the POS tagging YeBot will go back to his defaults mentioned earlier which will be seen below.

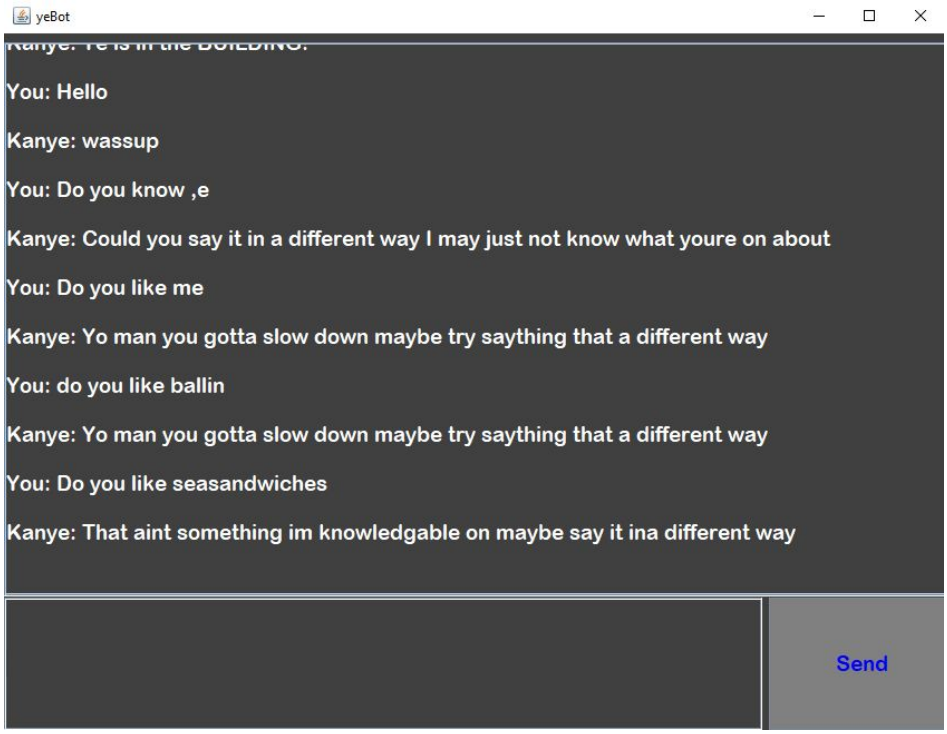


Figure 5: YeBot Limitation Default Response

6.0 API

The following are a list of features that could be extracted from the code and design that could be shared with others as an API.

6.1 AIML

As a team we made several additional files to the AIML library. If an individual wanted to get responses similar to Kanye west they could use these files in their own code or edit them as need be. They would also then have examples of what normal conversation can look like in AIML. Since a large portion of the AIML library has bot like responses and it loses the feeling as if you may be talking to another human.

6.2 WordNet

The WordNet allows an individual to look at all possible synonyms to all words in the sentence entered and compare them to the AIML files to decide on a response. This could be used in conjunction with AIML or they could look at the code and modify it for their system since strings are used.

6.3 GUI

YeBot has a very general GUI that could very easily be implemented in other bots if modified correctly. It is also dark themed which is a favourite for many individuals/

6.3 POS Tagging

The POS tagging could be used be an individual to pick up nouns which is the implementation I used. However, they could also use other forms of the tagging to give more variants in their responses based on the tagging information they were able to pick up. Since nouns were the only tagging used in YeBot. However the code is ease enough to understand and they could add several more if statements to get more accurate responses.

6.5 Named Entity Recognition

Similar to the WordNet and POS tagging YeBot also has an implementation for Named Entity Recognition which others could use in their code. They could also modify it for more varied responses and take it a step further in the implementation,.