Intelligent Chatbot Framework Based on Artificial Intelligence

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Abstract- *This paper discloses a virtual conversational method and system to relieve the psychological stress of adolescents. It also aims at providing some positive information through continuous dialogue answers in order to guide adolescents to think and face difficulties with a positive and optimistic attitude and the agenda of reliving the psychological pressure of the adolescents can be achieved. Conventional face-to-face stress detection and relief methods do not work when confronted with those adolescents who are reluctant to express their negative emotions to the people in real life. In this paper, we would like to present an adolescent oriented intelligent conversational chatting system called "Happy Soul", which acts as a virtual friend who can assist to encourage, understand, comfort, and guide stressful adolescents to pour out their bad and negative feelings, thereby releasing the stress. Chat bots, or conversational interfaces, present a new way for adolescents to interact with computer systems. This chatbot will allow a user to simply ask questions in the same way that they would address a human. The technology at the core of the proposed chatbot is natural language processing ("NLP"), RNN and client server architecture with the help of python GUI.*

Keywords- Adolescents, Natural language processing, RNN,GUI.

I. INTRODUCTION

Businesses constantly need to evolve and adopt newer trends to succeed. These days companies are implementing chatbots that help in solving customer queries, improving communication, and remote troubleshooting to enhance customer experience. Soon as I heard this reply from Siri, I knew I found a perfect partner to savors i hours of solitude. From stupid questions to some pretty serious advice, Siri has been always there for me. How amazing it is to tell someone everything and anything and not being judged at all. A top class feeling it is and that's what the beauty of a chatbot is.

A chatbot is an intelligent piece of software that is capable of communicating and performing actions similar to a human. Chatbots are used a lot in customer interaction, marketing on social network sites and instantly messaging the client. There are two basic types of chatbot models based on how they are built; Retrieval based and Generative based models. How do the Chatbots function? The main technology that lies behind chatbots is NLP and Machine Learning. When a question is presented to a chatbot, a series or complex algorithms process the received input, understand what the user is asking, and based on that, determines the answer suitable to the question. Chatbots have to rely on the ability of the algorithms to detect the complexity of both text and spoken words. Some chatbots perform very well to the point it becomes difficult to differentiate whether the user is a machine or a human. However, handling complex conversations is a huge challenge; where there is a usage of various figures of speech, it may be difficult for machines to understand.

Types of Chatbots

Chatbots are categorized into two different types. Let us look at both and see how they function.

1. Retrieval based Chatbots: A retrieval-based chatbot uses predefined input patterns and responses. It then uses some type of heuristic approach to select the appropriate response. It is widely used in the industry to make goal-oriented chatbots where we can customize the tone and flow of the chatbot to drive our customers with the best experience.

2. Generative based Chatbots: Generative models are not based on some predefined responses. They are based on seq 2 seq neural networks. It is the same idea as machine translation. In machine translation, we translate the source code from one language to another language but here, we are going to transform input into an output. It needs a large amount of data and it is based on Deep Neural networks. Use Cases of Chatbots There are various interesting chatbots, which can make your life easy. For companies, chatbot development focuses on improving their business processes and providing better user experience to their customers. It is also being utilized to serve customers on social media platforms like Face book and others. However, most of the Face book bots are

easy to develop and use, as many of them do not need coding, and anyone can create it.

II. LITERATURE SURVEY

BACKGROUND HISTORY

ELIZA was the very first chatbot as mentioned above. It was created by Joseph Weizenbaum in 1966 and it uses pattern matching and substitution methodology to simulate conversation.

The program was designed in a way that it mimics human conversation. The Chatbot ELIZA worked by passing the words that users entered into a computer and then pairing them to a list of possible scripted responses. It uses a script that simulated a psychotherapist. The script proved to be a significant impact on natural language processing and unnatural intelligence, with copies and variants protruding up at academies around the country.

However, Weizenbaum was troubled by the reaction of users. He intended ELIZA to be a mere caricature of human conversation, yet suddenly users were confiding their most profound thoughts in ELIZA. Experts were declaring that chatbots would be indistinguishable from humans within a small number of years.

A.L.I.C.E. is a universal language processing chatbot that uses heuristic pattern matching to carry conversations. In 1995, Richard Wallace pioneered the construction of ALICE. It was formerly known as Alicebot because it was first to run on a computer by the name of Alice.

The program works with the XML schema known as artificial intelligence markup language (AIML), which helps specify conversation rules. In 1998, the program was edited in Java, and in 2001 Wallace printed an AIML specification. From there, other developers drafted free and open sources of ALICE in different programming languages and a variety of foreign languages.

The program simulates chatting with a real person over the Internet. Alice is a young-looking woman in human years and tells a user her age, hobbies and other fascinating facts, as well as answering to the user's dialog.

Siri was formed by Apple for iOS in 2010; it is an intelligent personal assistant and learning navigator that uses a natural language UI. It paved the system for all AI bots and PAs after that.

A patent application by the United States Patent and Trademark Office details a new Apple service where users could make inquiries and conversation with Siri through Messages. The new patent is similar to a published late last year, but now includes deeper integration with audio, video, and image files.

Similar to other texting and Facebook Messenger Apple's patent describes a Siri that could perform current duties without the user having to chat aloud. That could be helpful in several public spheres.

They could reply to a text, audio, images, and video when transferred to it by the user. Apple said this would result in more fruitful interactive experience among a consumer and a digital assistant.The patent provides a few examples of a conversation held between Siri and a user in Messages, with the user asking questions.

Google Now was launched at Google Inch in 2012. It answers questions, performs actions through requests made to a set of web services and makes recommendations.

It was part of a package of updates and UI modifications for mobile search, which included a female-voiced portable assistant to compete with Apple's Siri.

Google Now was initially a way to get contextually appropriate information based on location and time of the day. It evolved to become much more complicated and elaborate, with a broad range of content categories delivered on cards.

Sometimes it refers to us as predictive search. Currently, it's built for use in smartphones and has been upgraded to accommodate several features.

Google Now was replaced by Google Assistant in 2017. Today, the assistant is part of a more aggressive Google search growth strategy. The idea is simple, Google wants to provide information in an easy-to-read format before you even know you need it.

Cortana was first demonstrated at Microsoft's Build 2014 developer conference, and it became directly integrated into both Windows phone devices and Windows 10 PCs.

This program uses voice recognition and relevant algorithms to get and respond to voice commands.

For someone to get started, he or she must type a question in the search box, or select the microphone and talk

to Cortana. If a person is not very sure of what to say, he or she will see suggestions on the lock screen, as well as in Cortana home by selecting the search box on the taskbar.

Cortana can perform tasks like reminders based on time, places, or people, send emails and texts, create and manage lists, chit-chat, and play games, find facts, files, locations, and info among others.

Alexa is an intelligent personal assistant developed by Amazon. It was introduced in 2014 and is now built in to devices such as the Amazon Echo, the Echo Dot, the Echo Show and more. There is also an Alexa app and more devices from third-party manufacturers that have Alexa built in to them.

All you have to do is say "Alexa, play some music" or "Alexa, find me an Italian restaurant" and she will help you out.

Using nothing but the sound of your voice, you can search the Web, play music, create to-do or shopping lists, set alarms, stream podcasts, play audiobooks, get news or weather reports, control your smart-home products and more.

To add to the capabilities of any Alexa-enabled device, Amazon allows developers to build and publish skills for Alexa using the Alexa Skills Kit (ASK). You can download skills for free with the Alexa app.

EXISTING SYSTEM

In the year 2009, a company called WeChat in China created a more advanced Chatbot. Since its launch, WeChat has conquered the hearts of many users who demonstrate an unwavering loyalty to it. It is a highly thriving social media platform.

Through its platform, it has made it easy to create very simple chatbots. It has grown to be an example of the most favored ways for marketers and employers to reduce the work they do as they interact with customers online.

Though it has implications and is less performant than today's messaging apps such as Facebook Messenger, Slack, and Telegram, it doesn't mean that you cannot construct a very smart bot on WeChat. Chumen Wenwen Company, founded in 2012 by a former Google employee, has built a very sophisticated bot running on WeChat.

Early in 2016, we saw the intro of the first wave of artificial data technology in the design of chatbots. Social media platforms like Facebook enabled developers to build a chatbot for their trademark or service so that customers could carry out some of their daily actions from inside their messaging platform.

In 2018, the prize for the winning team is $3.5 million, much higher than the incentive from the Loebner Prize. The task is to create a chatbot which can vocally communicate through the smart device Amazon Echo. This device is a speaker with a built-in microphone where Alexa, voice-controlled AI, 'resides'. She constantly listens to what happens around her and she is always ready to fulfil user's wish regarding the functioning of a smart household and data processing. Amazon uses outputs from the competition to improve Alexa and widen her ecosystem. And it is very apparent. At the moment, Alexa looks more believable than the competing chatbot Google Assistant residing in the Google Home device

In early 2019. Chatbot on their Facebook profile, which was responsible for updates regarding check-in, delays or issuing of copies of boarding passes. A living member of the team would join a conversation only if there was a more complex request.

III. PROBLEM FORMULATION

The basic structure of chatbot is very similar with a Sequence to sequence model. The architecture consists of recurrent neural network of GRU cells with attention mechanism. But it contains three different mechanisms which can be used for generating response with specific emotion. The following are the characteristics of the system: Emotion Category Embedding: Representing different emotion category as an embedded vector. This vector will be learned during training by being feed to the decoder. The emotion embeds remains static and would not change in the flow. The architecture is a regular end to end sequence model, where the GRU is been used to be the basic cell and based on that we build our decoder using Recurrent Neural Network. We build our encoder using bi-directional LSTM and concatenate the cell state and hidden state to be the input of decoder.

PROBLEM DEFINATION

In this dissertation work States solution of slow responsive nature of text analyzing and filtering processes of text. All the text entered by the user mast be preprocessed so that text in the form of analysis While there are some instances, (like names "Bush" vs. "bush") where you may lose

context, lowercasing tokens are a simple and effective way of ensuring that the input fits a universal data format. Stemming is an optional process of reducing a word to its base form.

Things in this work should look into are converting common misspells; types from fast fingers and keystroke errors; cultural abbreviations like “xde” into “tak ada” (Bahasa Malaysia) or ppl into people; remove superfluous cultural lingo, like “eh” or “la”; expand contractions, like “what’s” into “what is”; and, standardize common terms like “email”, “e-mail” and “e mail”. If you can effectively do this, you can focus your time on building clean data models without needing to account for the endless supply of garbage words people may give you.

PROBLEM SYSTEM

In this dissertation Python with source code, we are going to build a chatbot using deep learning techniques. The chatbot will be trained on the dataset which contains categories (intents), pattern and responses. We use a special recurrent neural network (LSTM) to classify which category the user’s message belongs to and then we will give a random response from the list of responses. Let’s create a retrieval based chatbot using NLTK, Keras, Python, etc. The dataset we will be using is ‘intents.json’. This is a JSON file that contains the patterns we need to find and the responses we want to return to the user.

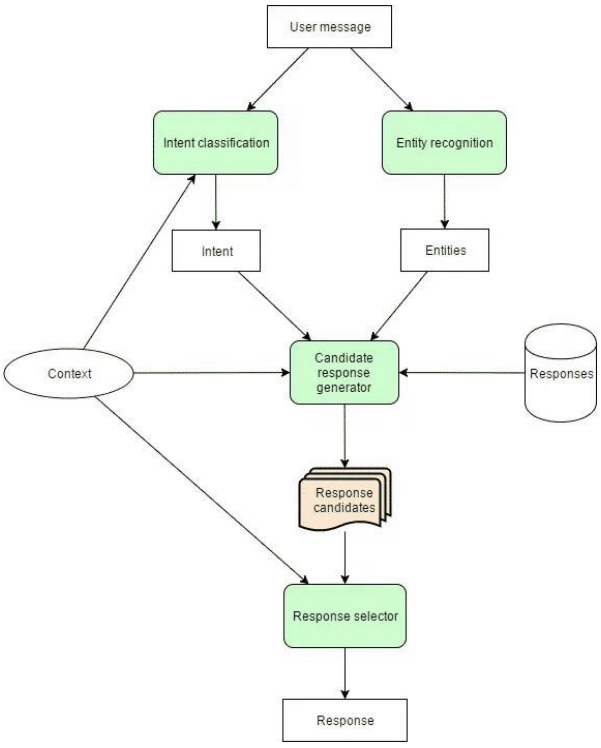

Figure 1. Chatbot working block diagram

IV. SYSTEM ARCHITECTURE

Chatbot architecture is the heart of chatbot development. Based on the usability and context of business operations the architecture involved in building a chatbot changes dramatically. So, based on client requirements need to alter different elements; but the basic communication flow remains the same. Learn how to choose the right chatbot architecture and various aspects of the Conversational Chatbot.

Choosing the correct architecture depends on what type of domain the chatbot will have. For example, you might ask a chatbot something and the chatbot replies to that. Maybe in mid-conversation, you leave the conversation, only to pick the conversation up later. Based on the type of chatbot you choose to build, the chatbot may or may not save the conversation history. For narrow domains a pattern matching architecture would be the ideal choice. However, for chatbots that deal with multiple domains or multiple services, broader domain. In these cases, sophisticated, state-of-the-art neural network architectures, such as Long Short-Term Memory (lstms) and reinforcement learningagents are your best bet. Due to the varying nature of chatbot usage, the architecture will change upon the unique needs of the chatbot.

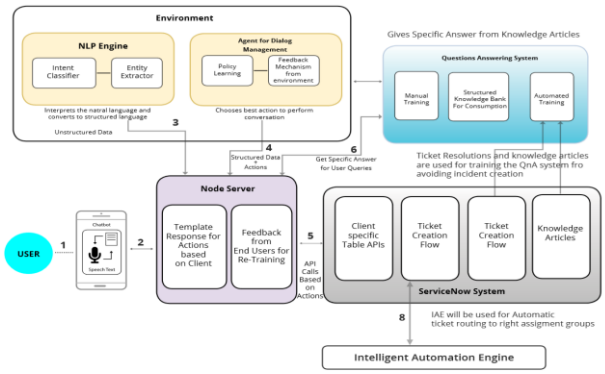

Figure. Architecture of a Conversational Chatbot

V. SYSTEM EXECUTION

First need to open Anaconda powershell promp as it create python environment in our system. Using cd command need to go the folder with code .

Using ls command can see the files available in the particular folder. In this folder all the vinyl files, python files and supporting libraries are available. To start a python files need to write python train.py which is the training command so that all the yml files start reading and system is now able to response as per the situation which part of the system shows how the machine learning implement in real time which is a

kind of slow process because machine needs to learn all the data sets provide by us so it will take a little bit time to trade itself now once the process is 100% that means machine is ready to use.

Using app.py command can run the chatbot system which will give link then chatbot link will open and start reading and system is now able to response as per the situation.

VI. RESULT ANALYSIS

This jio is used to just give a user friendly touch of our project which contains a chatbot side and user input providing site where user can easily type its question in textbook given below and chatbot will analyses the input and response respectively.

In Chatbot can see that all the question asked by user are easily answered by chatbot with the help of machine learning training data set. User can search the respective answer easily the processing time of testing is very low so user do not need to wait for any kind of answer on real time.

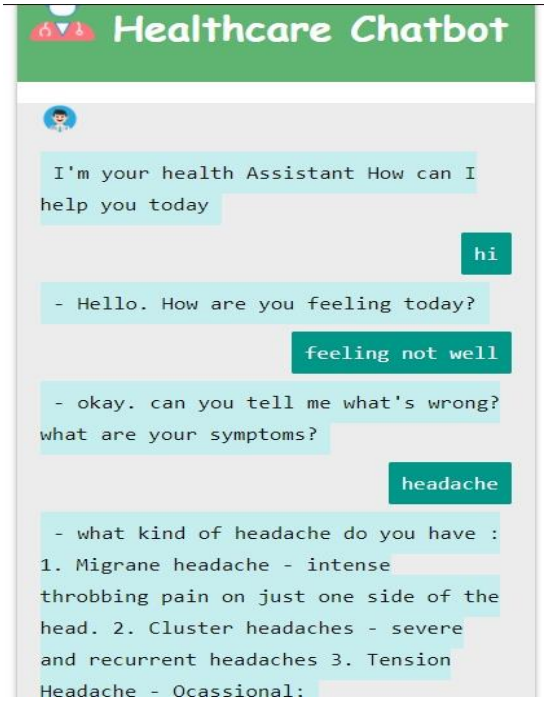

Figure. Healthcare chatbot

VII. CONCLUSION

The training on Cornell Movie Subtitle corpus produced result which needs further improvement and more attention and speculation on training parameters. Adding more quality data will further improve performance. Also, the training model should be trained with other hyper-parameters and different dataset for further experimentation. This was an attempt to experiment with Deep Neural Network for dialogue generation in order to develop intelligent chatbot.

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