Implementation of Chat-Bot System using Machine Learning and Natural Language Processing

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ABSTRACT

A chat-bot is a computer program that can converse with humans using artificial intelligence in messaging platforms. The goal of the project is to add a chat-bot feature and API for Yioop. discussion groups, blogs, wikis etc. Yioop provides the great help in web search portal. It has its own account management system with the ability to set up groups that have discussions boards. Groups are combined users that have permission to a group feed. The user who creates a group is the owner or Admin of the group. Posts are grouped by thread in a group containing the most recent activity at the top. The chat-bot API for Yioop will allow developers to create new chat-bots, powered by rules or artificial intelligence, that can interact like a human with users in a groups feed page. Example chat-bots that can be developed with this API is weather chat-bots or book flight chat-bots. Over past few years, messaging applications have become more popular than Social networking sites. People are using messaging applications these days such as Facebook Messenger, Skype, Viber, Telegram, Slack etc. This is making other businesses available on messaging platforms leads to proactive interaction with users about their products. To interact on such messaging platforms with many users, the businesses can write a computer program that can converse like a human which is called a chat-bot.

Keywords: Yioop, messaging, Conversation, Artificial Intelligence.

INTRODUCTION:

Machine learning chat-bots works using artificial intelligence. User need not to be more specific while talking with a bot because it can understand the natural language, not only commands. This kind of bots get continuously better or smarter as it learns from past conversations it had with people. Here are simple examples which illustrate how they work. The following is a conversation between a human and a chat-bot: Human: “I need a flight from San Jose to New York.” Bot: “Sure! When would you like to travel?” Human: “From Dec 20, 2016 to Jan 28, 2017.” Bot: “Great! Looking for flights.”
In order to achieve the ultimate goal, we have taken an iterative approach and divided my work into four major deliverables. These deliverables not only helped us in understanding the code structure of Yioop but also enhances Yioop’s functionality. In the rest of the report, we will be discussing about the four deliverables. To understand more on chat-bot service, we had implemented a Facebook Messenger Weather Bot in deliverable 1, which is discussed in next section. The purpose of deliverable 2 is to introduce chat-bots to the Yioop. We have added a Bot Configuration setting which is used to add bot users in Yioop. In the next deliverable, we have added functionality where the user willbe able to call bots in a group thread. Activation of bots will happen by calling respective call back URL which is already configured that helps bots to have a conversation with users.

RELATED WORK:

A survey done on[1] the atmosphere of the music describes the intrinsic emotional meaning of a musical clip. It is useful for musical understanding, musical research and some music-related applications. In this paper, we present a hierarchical structure to automate the task of detecting mood based on acoustic musical data, following some psychological theories of music in Western cultures. Three sets of characteristics, intensity, timbre and

rhythm are extracted to represent the characteristics of a music clip. On the other hand, a mood tracking approach is also presented for an entire piece of music. Experimental evaluations indicate that the proposed algorithms produce satisfactory results.The human face plays a prodigious role in the automatic recognition of emotions in the field of human emotion identification and human-computer interaction for real applications such as driver status monitoring, personalized learning, health monitoring, etc. However, they are not considered dynamic characteristics independent of the subject, so they are not robust enough for the task of recognizing real life with the variation of the subject (human face), the movement of the head and the change of illumination. In this article, we tried to design an automated framework for detecting emotions using facial expression. For human-computer interaction, facial expression is a platform for non- verbal communication. Emotions are actually changing events that are evoked as a result of the driving force Thus, in the application of real life, the detection of emotions is a very demanding task. The facial expression recognitionsystem requires the overcoming of the human face that has multiple variability, such as color, orientation, expression, posture and consistency, etc. In our framework, we take the live broadcast frame and process it using Grabor feature extraction and the neural network. To detect emotions, the extraction of facial attributes is used through the analysis of the main components and a grouping of different facial expressions with their respective emotions. Finally, to determine the facial expression separately, the vector of the processed features is channelled through the classifications of already learned patterns.

Prof. GirishWadhwa [2], proposed to build an enquiry Chat Bot project will be built using artificial intelligence algorithms that will analyse user's queries and understand user's message. This system will be a chatbot which will provide answers to the queries of the students. Students will just have to select the category for the department queries and then ask the query to the bot that will be used for chatting. The main objective of the project is to develop an algorithm that will be used to identify answers related to user submitted questions.

The need is to develop a database where all the related data will be stored and to develop a web interface. A database will be developed, which will store information about questions, answers, keywords, logs and feedback messages. In 2016, BayuSetiaji, "Chat-bot using knowledge in Database" A chatbot aims to make a conversation between both human and machine. The machine has been embedded knowledge to identify the sentences and making a decision itselfas response to answer a question. The user message i.e. query is stored to the response principle. Then it matches with responses, from input sentence, it will be scored to get the similarity of sentences, the higher score obtained the more similar of reference sentences. The sentence similarity calculation is divides input sentence as two letters of input sentence. The knowledge of chat-bot is stored in the database. be reasonably reliable, and accurate in fatigue characterization.

PROPOSED ALGORITHM:

Description of the Proposed Algorithm:

Porter Stemmer Algorithm Porter stemming algorithm is a process for removing suffixes from words in English.Removing suffixes automatically is an operation which is especially useful in the field of information retrieval.

Following are the steps of this algorithm: -

[1] Gets rid of plurals and -ed or -ing suffixes
[2] Turns terminal y to i when there is another vowel in the stem
[3] Maps double suffixes to single ones: -ization, -ational, etc
[4] Deals with suffixes, -full, -ness etc. Takes off -ant, -ence, etc.Removes a final –e.

CHAT BOT RESPONDING SYSTEM:

NLP Processing and Sentiment Analysis for Complaint: When user complaint is submitted to the system, NLP is applied and sense of the complaint is detected. The sense of the words is found using part of speech tagging and word net dictionary. By Using the sentiment analysis negation level of a complaint is detected. And user complaints are prioritized accordingly.

Search Questions in knowledge database: Once the negation level of the complaint is detected, furthermore, the exactquestion in the complaint is detected using WorldNet.

System design:

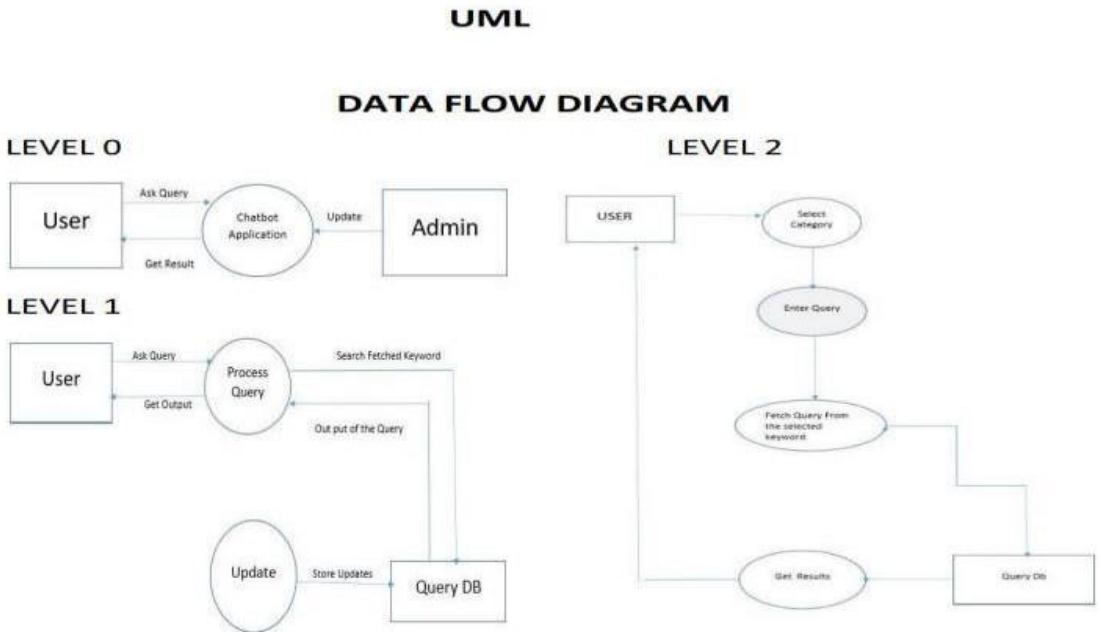

Fig 1: Data Flow of Chat-bot

PSEUDO CODE:

Step 1: User registers him/her on Chat-Bot application.
Step 2: Then submits his/her complaints and queries regarding the college/student details Step 3: Chat-BOT Responding System is Initialized
Step 4: NLP Processing and Sentiment Analysis is done for user's Complaint
Step 5: The KNN(K-Nearest Neighbour Algorithm) Searches Questions in knowledge database Step 6:The System the Answers the Complaints
Step 7: End

SIMULATION RESULTS:

- This system will be a web application which is expected to provide answers to the analysed queries of the user.
- Users will just have to select the options for queries and then ask the query to the bot that will be used for answering itaccordingly.
- The user will get the appropriate answers to their queries, The answers are expected to use the artificial intelligencealgorithms.
- The system will reply to the user with the help of effective graphical user interface (GUI).
- It expected to help the students/user to be updated about the college activities.

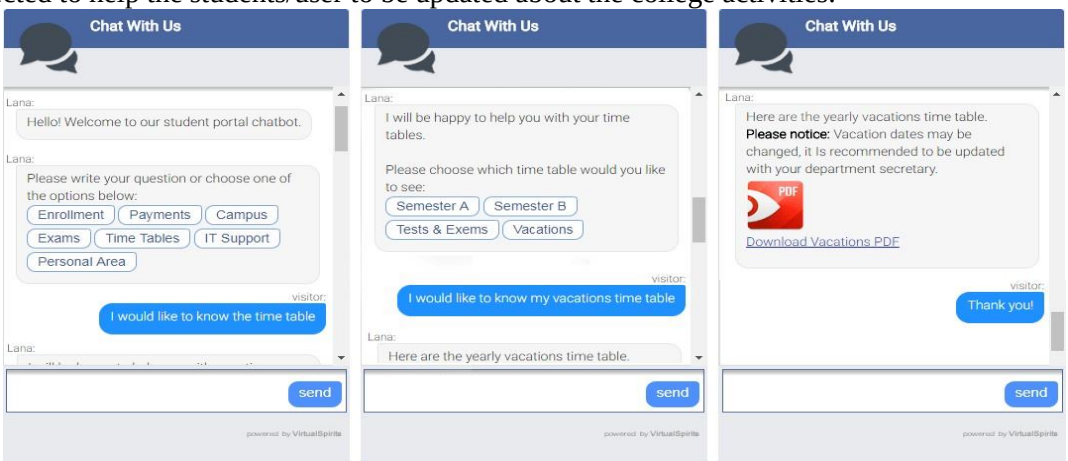

Fig 2: Outcome of Chat-bot

CONCLUSION AND FUTURE WORK:

Chat-bots are the new Apps. As we have discussed in the above deliverables, this project brings the power of chat-bots. Chat-bots can give a human like touch to some aspects and make it an enjoying conversation. And they are focused on providing information and completing tasks for the humans or users they interact with. The above-mentioned functionality in all the deliverables is implemented. By implementing the above-mentioned deliverables, we were able to add basic chat-bot functionality. The challenge would be conversing with multiple bot users and multiple users. We create a software tool which will be used by any organisation or company to help the users to freely upload their queries. Once the complaint is stored or registered in the database, automatic tokens are generated and conveyed to the customer through a text message and email for further tracking of the complaint. Natural language processing technologies are used for parsing, tokenizing, stemming and filtering the content of the complaint. The output is implemented or directed to the algorithm where the strength of the sentence is calculated. The intensity of negation is calculated, which helps prioritize the complaint automatically for the service provider to resolve the complaint. In this way, the proposed system will be helpful for many organizations to ensure quality service provision and customer satisfaction with less human efforts. It is very helpful to the users as it allows to enter questions in natural language and desired information is obtained easily to the user. In this paper, details about design, algorithm used and implementation of the Chatbot is presented. The user doesn't need to gather information by visiting websites or colleges.

REFERENCES:

Dale, R. (2016). "The return of the chatbots". Natural Language Engineering, 22(5), 811-817. doi: https://doi.org/10.1017/S1351324916000243.

Hinton, G. E. (2002). "Training products of experts by minimizing contrastive divergence". Neural Computation, 14, 1711–1800.

Pawar, Harsh. "College Enquiry Chatbot Using Knowledge in Database." International Journal for Research in Applied Science and Engineering Technology 6 (2018): 2494-2496.

Reshmi, S., &Balakrishnan, K. (2016). Implementation of an inquisitive chatbot for database supported knowledge bases. Sādhanā, 41(10), 11731178.

Salakhutdinov, R., Mnih, A., & Hinton, G. (2007, June). "Restricted Boltzmann machines for collaborative filtering".In Proceedings of the 24th international conference on Machine learning (pp. 791-798).ACM.

Soper, T. (2017, January 25). Http://www.geekwire.com/2017/8-millionpeople-amazon-echo-customer-awareness- increases-dramatically/. Retrieved March 7, 2017, from http://www.geekwire.com/2017/8-millionpeople-amazon-echo-customer-awareness-increases-dramatically.

Sun, Y., Zhang, Y., Chen, Y., & Jin, R. (2016, September). "Conversational Recommendation System with Unsupervised Learning".In Proceedings of the 10th ACM Conference on Recommender Systems (pp. 397-398).ACM. doi:10.1145/2959100.2959114.

Thosar, Prof. D. S. et al. "Review on Mood Detection using Image Processing and Chatbot using Artificial Intelligence." (2018).
