

# ChatBot Detection using Text Classification

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**Abstract** - The application's main aim is to detect chatbots from a given chat. For this the various patterns in chatbots that are observed were studied. The research helped in deciding what patterns are to be observed in order to implement the chatbot detection features. It was found that many of the features can be implemented passively like the time based and size-based methods. Other features like the text classifier can be implemented by training a model. Various graphical tools can be implemented to analyze the efficiency of the system and the help the end users take a decision. Sentiment of the text will also be analyzed to get an insight and classify the texts. It can be used by various chat room administrators and sites to detect if there are any chatbots present on their website. It will help them in saving the resources from chatbots. E-commerce websites can prevent their resources being used up by chatbots by detecting them and thus directing their resources to real clients.

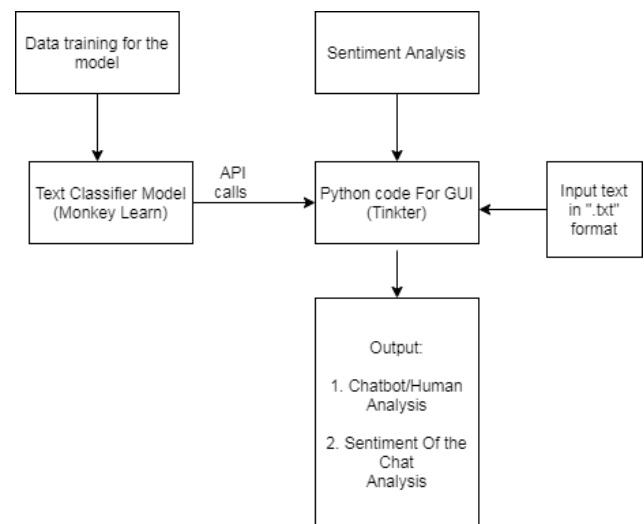
**Key Words:** Chatbot Detetction, Text classifier, Sentiment Analysis, Chatbot attacks, Chatbot analysis

## 1. INTRODUCTION

In the era of Digital marketing where companies try to use different methods to reach to the customers and provide services. One such method which is becoming popular in recent times is a chatbot. Chatbot helps the company to provide services without any human assistance. The demand of chatbot has led to increase in frauds done with the help of chatbot. Therefore, it is the need to bust such chatbot. Distributed messaging services are facing the growing problem of "chatbots". But this problem can be tackled by studying the behavioral patterns (e.g., message size, inter-message delays) can be used to passively distinguish between humans and chatbots. By utilizing certain methods this "chatbots" can be separate from people. To tackle these problems the project should be able to determine the difference between a chatbot and a human by observing the various patterns it observes it in the text communication between them. In order to achieve this, the text will be processed and then analysed by various methods and the output will be presented to the user. A text classifier will be used to classify the text based on topic, aspect and relevance in one of the methods. The text classifier is based on the Monkey Learn API that will be used to integrate it using python. The GUI will be based on Tkinter. Also, a Sentiment Analysis will be done on the given text which will tell us the sentiment of the given text.

## 2. SYSTEM DESIGN

The objective is to develop a system that accepts a conversation exported from popular messaging apps and then process it to find if one of the people in the conversation is a Chat Bot and returns the same to the user. The system uses the various methods of Chat Bot Detection like message size, time-based methods as well as text classifiers to tell if it is Chat Bot or not. It also tells us the Sentiment of the given text. To develop a system that is capable of distinguishing between a chatbot and a human. To implement the various methods of chatbot classification. To make an accurate model for chat classification. To detect the current Sentiment.



Flowchart for Text Analyzer and Sentiment Analysis.

**Fig -1:** Flow Chart

## 3. IMPLEMENTATION

The Application is developed using python implementation involves certain steps. A GUI is developed for the main menu. The menu contains several options through which one can determine that the person is a chatbot or not.

Chat file which is in ".txt" format is given as input to the application along with the name of both the persons in the conversation is given as input. Various methods that are available are by Inter Message Delay, Size Method and Text Classifier and one add on feature of sentiment analysis. A Captcha system is deployed to prevent basic chatbots.



Fig -2: Main Menu of Application

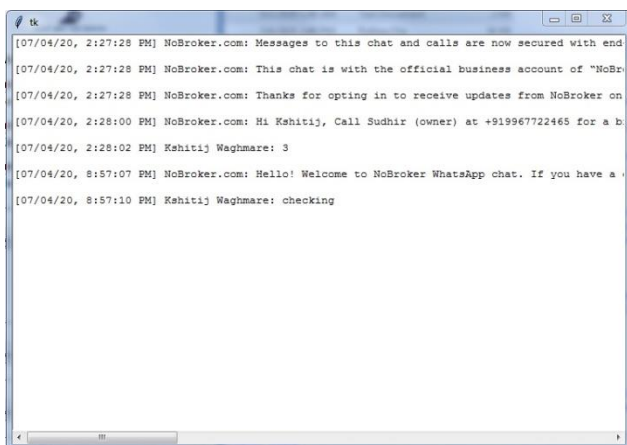


Fig -3: View Chat Option

This option enables to see the conversation.

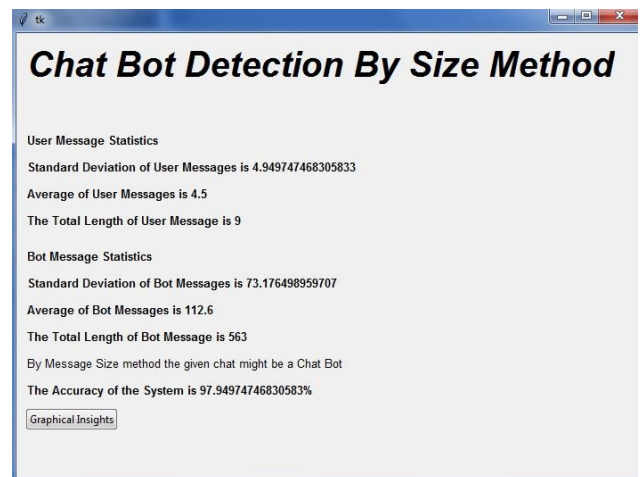


Fig -4: Chatbot detection by Size method

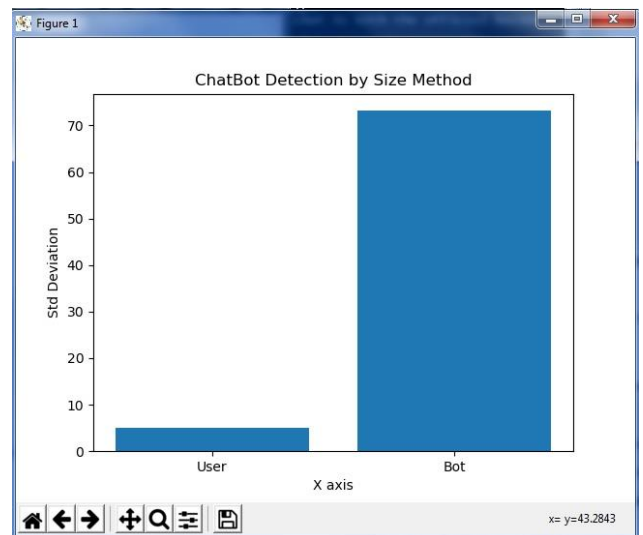


Fig -5: Graphical View of Size Method

From Fig. 4 and Fig. 5 it is seen that average message sizes of a bot is generally higher as compared to normal human counterpart.

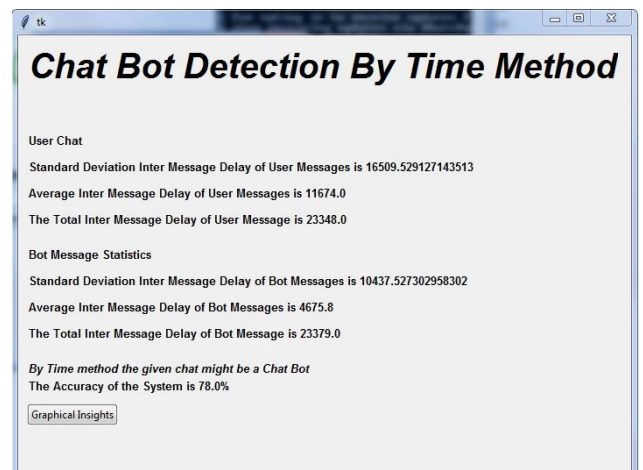


Fig -6: Chatbot Detection by Time Method

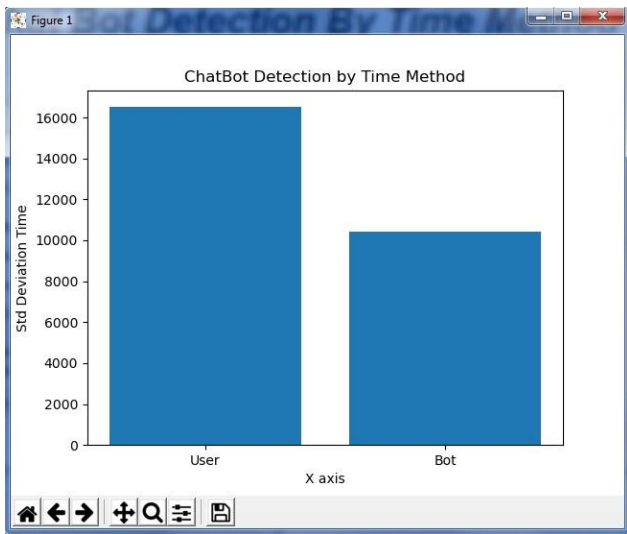


Fig -7: Graphical View of Time Method

It is clearly seen that the inter message delays of the bot is lower as compared to humans

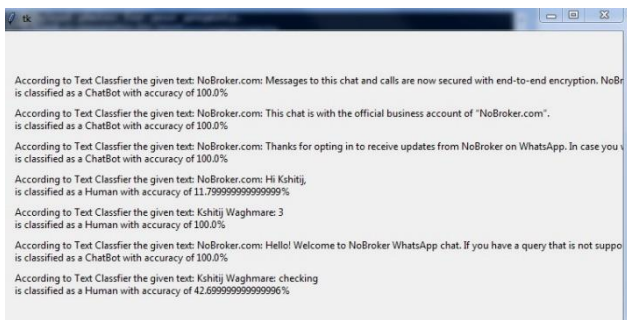


Fig -8: Analysis using Text Classifier

A model will be constructed that will classify text based on topic, relevance

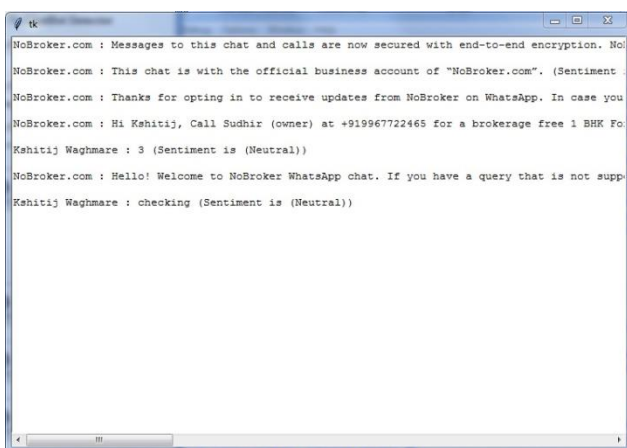


Fig -9: Sentiment Analysis

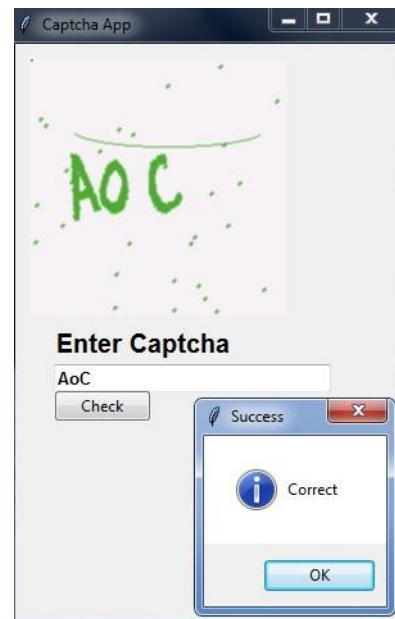


Fig -10: Captcha

The captcha is deployed at the beginning of the application

#### 4. COMPARISON

As discussed in the research paper below is the Potential Chatbot Detector Visualization [1].

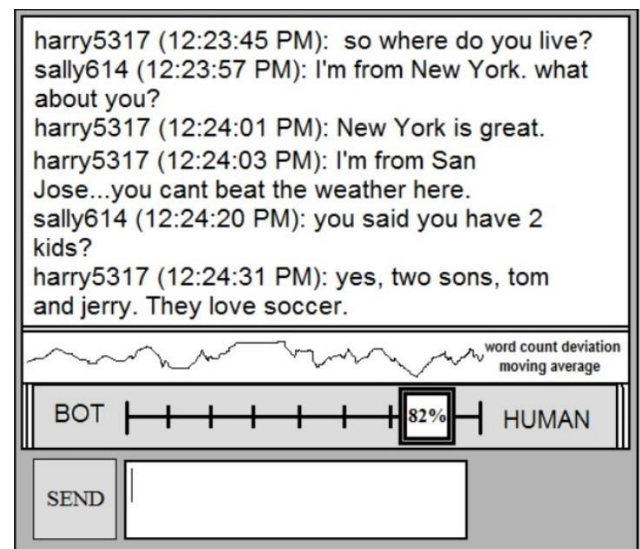


Fig -11: Potential Chatbot Detector Visualization

Based on the visualization below is the result of the output for the same chat by using our system that is based on this visualization.

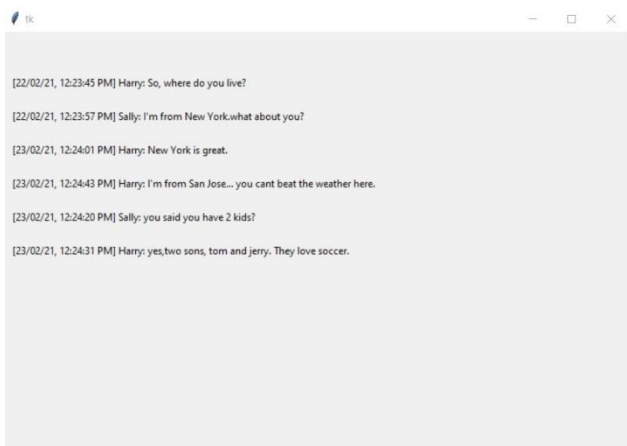


Fig -12: Chatbot Detector Implementation

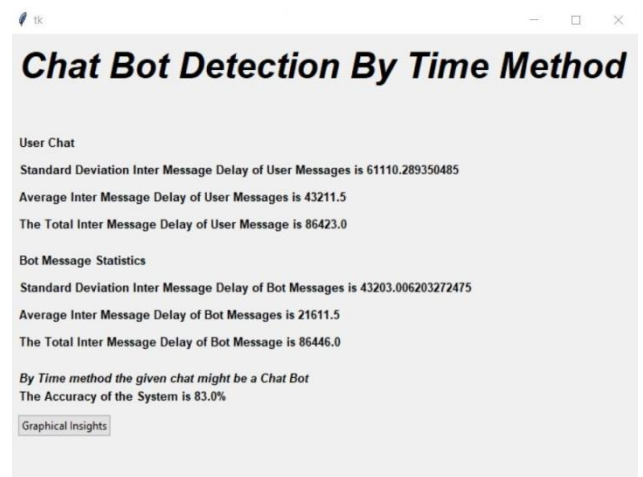


Fig -15: Chatbot Detector Implementation

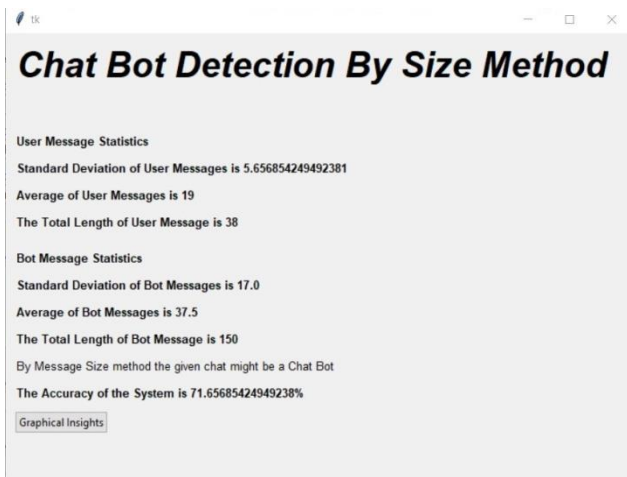


Fig -13: Chatbot Detector Implementation

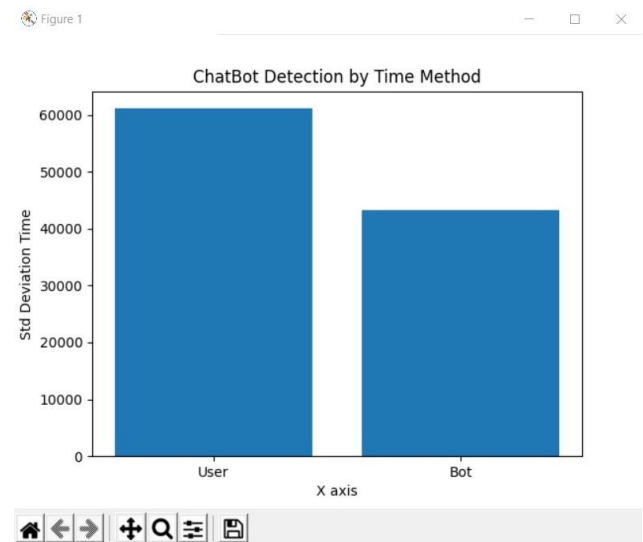


Fig -16: Chatbot Detector Implementation

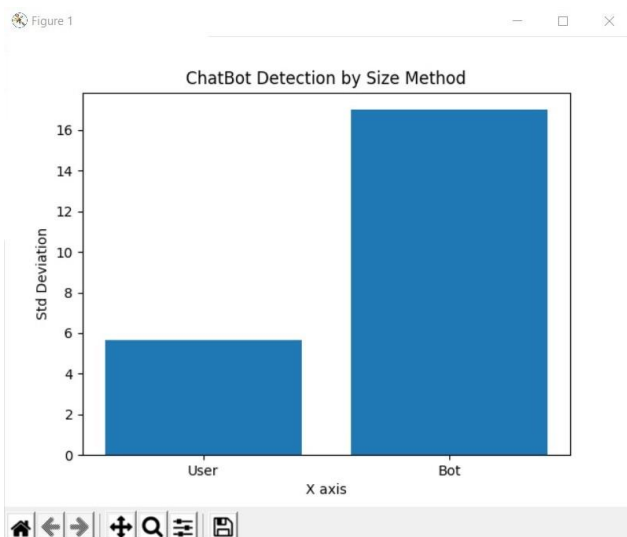


Fig -14: Chatbot Detector Implementation

As can be seen based on the qualities defined the appropriate output was provided.

## 5. CONCLUSION

Chatbot Detection system can be used by many firms and employees. Implementation of passive and active chatbot detection methods would potentially allow chat room creators and administrators to observe, detect, and remove bots without unduly interfering with the non-malicious communications taking place. The discussed detection methods might also be used by chat room security administrators for detecting and removing bots from their systems.

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