Assam Police Hackathon

Team : Cyber Bots

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ABSTRACT

Fake news and disinformation through social media have been a pressing issue in many countries across the world today. It is getting harder to differentiate between misleading information from the real facts. Fake news spread through social media in the country has become a serious problem. The instances of fake news/content shared are observed in situations like covid19, Citizenship (Amendment) Act 2019, elections etc. As responsible citizens of India, we wanted to tackle this issue using the latest technologies.

INTRODUCTION

In this project the main problem was Fake news, and to tackle the fake news/content, we had to know where the fake content comes from.A fake content may originate from fake news websites, social media and through communication channels. The goal of the solution is to fact check a news article/content. It is important to attribute the fake news to a channel, person, organization so that we can destroy it from the root.

The tool we are using for this purpose is WhatsApp. Ironically, WhatsApp is considered as a top source of fake news/content. But nowadays everyone had WhatsApp installed, even in rural areas. So our solution is to develop a "**WhatsApp Bot**" to fact-check and report fake content from the internet and social media. We use **machine learning** under the hood to detect fake content. Attributing fake information to a source is a challenging task, because the news may have transmitted from multiple sources and people. But we can always try to implement algorithms to tackle this issue. This project can also report the statistics of information received, which can be utilized for action towards fake content.

Implementing a "**WhatsApp Bot**" would help us in linking us to another problem statement regarding the women's safety, we can have an intended SOS button in the bot that can trigger the location of the sender and send it directly to the control station and from there it can be sent to the nearest police patrolling van and that can be very handy in terms of patrolling.

Why Whatsapp Bot?

Firstly we thought of implementing the solution through an app but these kind of apps didn't get much attention of the users so we implement whatsapp Bot because nowadays everyone is using whatsapp and with the help of whatsapp rural people also use this bot and try to check about fake news and it will be helpful for SOS alert. It will be helpful as effective policing too.

Tech Stack &Implementation Procedure:

For implementing this bot we use Machine learning in which we trained a dataset which we get from kaggle, Finding fake news from different sources is a very challenging task because there are the chances that the news can be transmitted by multiple people and sources.

So we created a Whatsapp bot which can find fake links and contents and it also has SOS alert so it will help in effective policing, For creating this bot different technologies are used.

1. **WhatsApp Business Account:** This is used to interact with users via different options, Whatsapp Business is the free app which can be downloaded from playstore, it is used for small business and create and show catalogue of service provided by any small and medium business. We use the whatsapp account because it allows companies to safely and securely message their customers directly within the **WhatsApp** messaging platform. One advantage over SMS is that **WhatsApp** is tied directly to a single phone number and provides a branded **business** profile rather than a string of digits and whatsapp business account is only supporting API so it was easy for us to use Twilio APi with whatsapp.

2. **Twilio API :** Twilio's APIs (Application Programming Interfaces) power its platform for communications. Behind these APIs is a software layer connecting and optimizing communications networks around the world to allow your users to call and message anyone, globally. It provides many separate REST APIs for sending text messages, making phone calls, looking up phone numbers, managing your accounts, and a whole lot more. In this project we use Twilio Whatsapp business API because it Simply and securely sends WhatsApp messages with Twilio APIs. Integrate WhatsApp and other communications channels like SMS and MMS with the Programmable Messaging API, or orchestrate multichannel, multiparty interactions using the Conversations API.

3. **Python:** We use Python programming language for creating backend of the bot. We used python because it is easy to use and it has a large number of libraries for every work and it is easy to implement and train machine learning models using python language. For creating this bot we use so many libraries which are listed below.

    a. flask
    b. flask_login
    c. flask_migrate
    d. flask_wtf
    e. flask_sqlalchemy
    f. email_validator
    g. Gunicorn
    h. bs4
    i. fake-useragent
    j. flask-Cors
    k. flask-Session
    l. flask-SocketIO
    m. requests
    n. twilio
    o. utils
    p. pandas

q. numpy
r. tensorflow
s. keras
t. nltk
u. newspaper3K
v. sqlite3

For using this bot as an administrator anyone has to install this much of requirements on his/her pc. For installing it anyone can simple type this command on their terminal.

pip3 install -r requirements.txt (text file is present on GitHub)

pip3 install as followed by libraries that was given above.

4. **Flask :** Flask is a lightweight WSGI web application framework. It is designed to make getting started quick and easy, with the ability to scale up to complex applications. It began as a simple wrapper around Werkzeug and Jinja and has become one of the most popular Python web application frameworks.flask provides you with tools, libraries and technologies that allow you to build a web application. This web application can be some web pages, a blog, a wiki or go as big as a web-based calendar application or a commercial website. We use flask to design our dashboard so that it will be easy for administrators to access and understand it and see the flow of request and traffic which is populated on whatsapp bot.

5. Machine Learning : We also use machine learning algorithm for creating whatsapp bot in which we use LSTM neural networks in fake news detection, We kept 4500 as max features for training the neural network Preprocessed the Text before feeding it into the neural networks.We got our training data preprocessed and ready for training the neural network.

```
lstm_model = Sequential(name = 'lstm_nn_model')
lstm_model.add(layer = Embedding(input_dim = max_features, output_dim = 120, name = '1st_layer'))
lstm_model.add(layer = LSTM(units = 120, dropout = 0.2, recurrent_dropout = 0.2, name = '2nd_layer'))
lstm_model.add(layer = Dropout(rate = 0.5, name = '3rd_layer'))
lstm_model.add(layer = Dense(units = 120,  activation = 'relu', name = '4th_layer'))
lstm_model.add(layer = Dropout(rate = 0.5, name = '5th_layer'))
lstm_model.add(layer = Dense(units = len(set(y)),  activation = 'sigmoid', name = 'output_layer'))
# compiling the model
lstm_model.compile(optimizer = 'adam', loss = 'sparse_categorical_crossentropy', metrics = ['accuracy'])
```

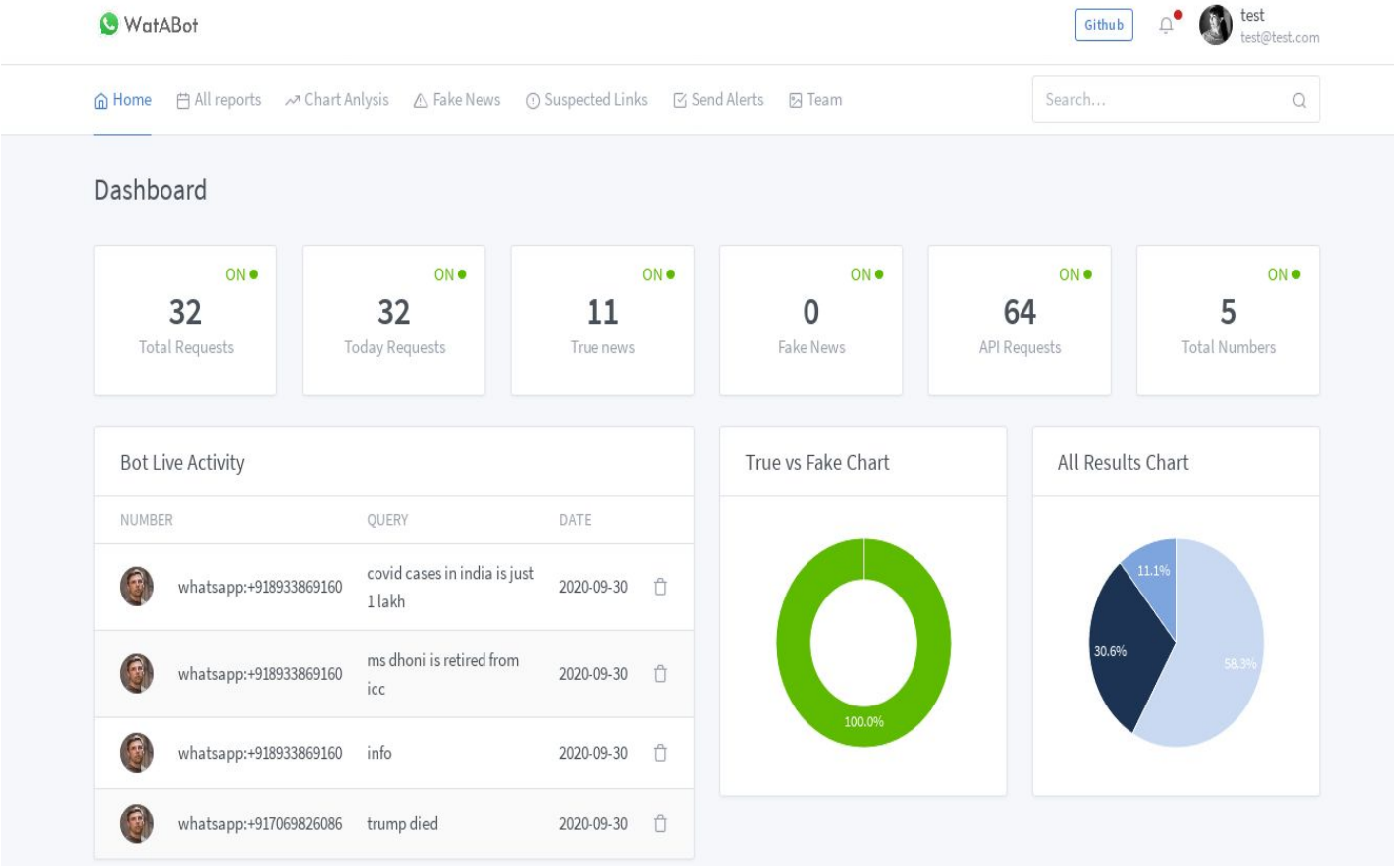
6. About Dataset : This dataset consists of about 40000 articles consisting of fake as well as real news. Our aim is to train our model so that it can correctly predict whether a given piece of news is real or fake.The fake and real news data is given in two separate datasets with each dataset consisting around 20000 articles each.

Installing and running

```
git clone https://github.com/WatABot/WatABot/
cd WatABot
pip3 install -r requirements.txt
python3 run.py
```

NOTE: You need to get a Twillo API token, for the whatsapp bot to work. Add your token in **https://github.com/WatABot/WatABot/blob/master/twilio-token.txt** file

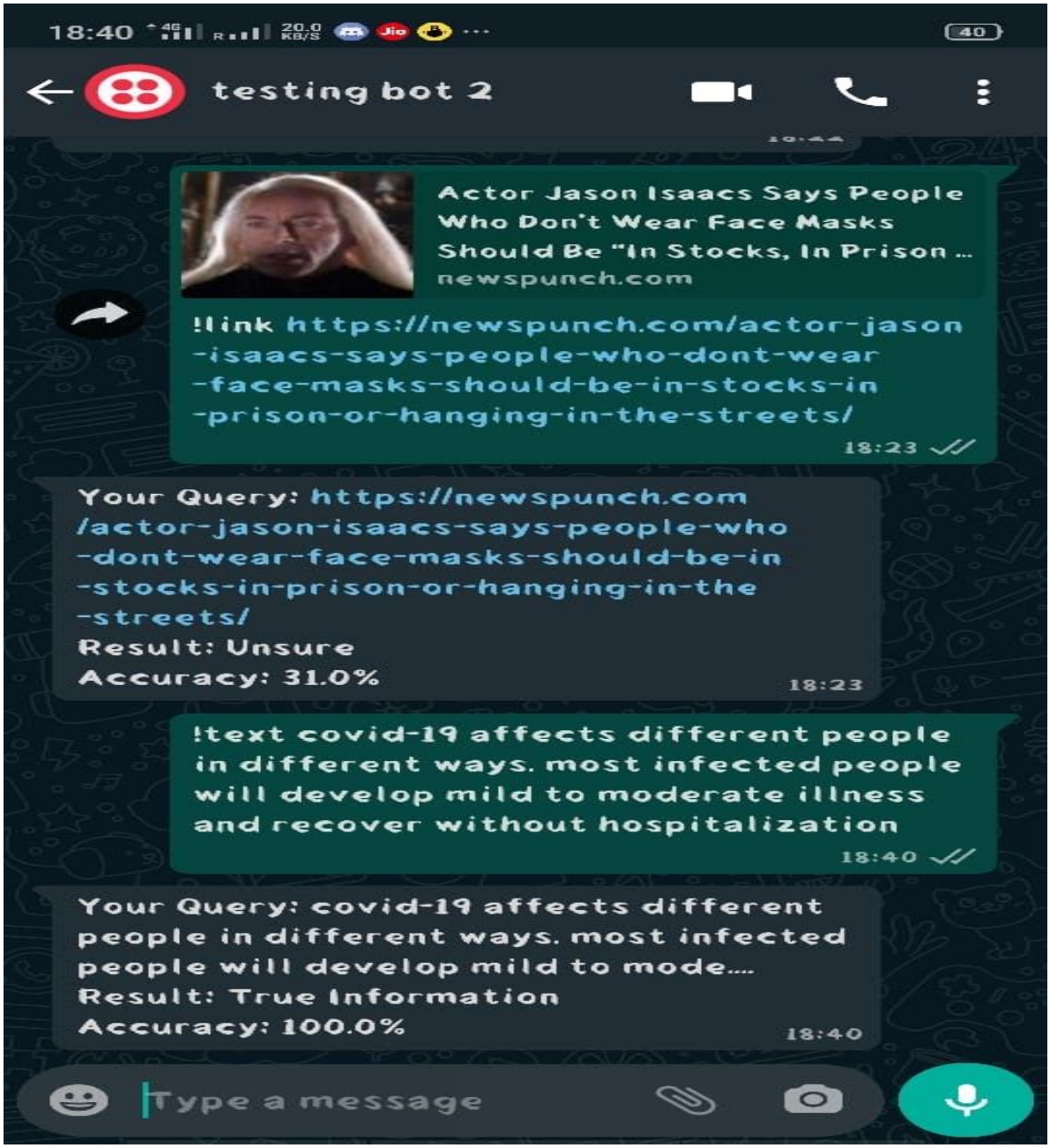
Tool Output



Frontend gui output

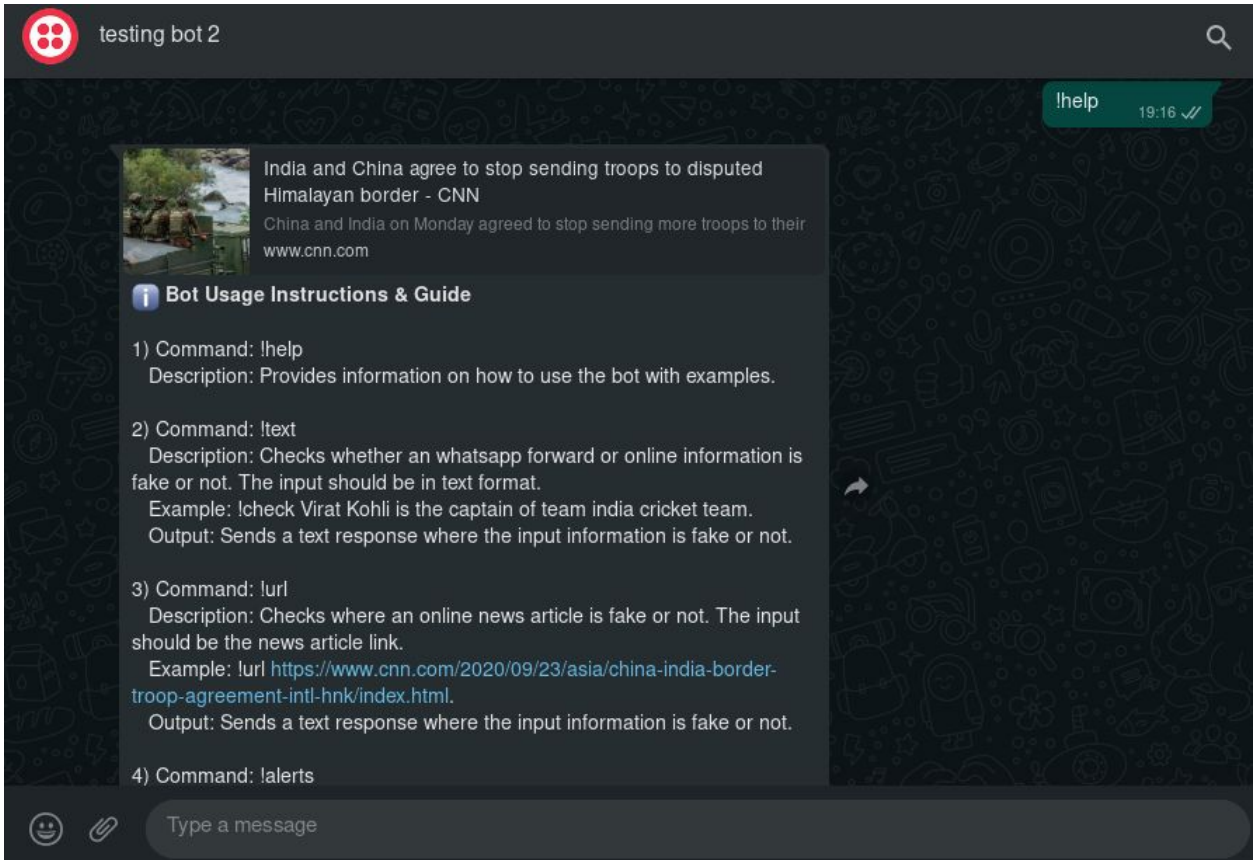
In above image as we can see this is the gui frontend of whatabot tool which we created, from here it will be easy for administrator to check the traffic of data which will be created on whatsapp bot and it have features like true vs fake chart in which it will be show the percentage of true and fake news. It can also represent Bot live activity from there we can find the phone numbers who will query anything along with their query and date. Alongwith this it also shows chart analysis and it also has a fake news section. This dashboard is totally designed for an administrator to keep on eye on the request.

We also use twilio whatsapp business API for creating a bot in which users can save bot numbers in his/her phone and he or she can report or query about fake news, links and images on whatsapp bot. It is easy to use and bot will start working with a simple 'hi' command. And anyone can check fake news with the given commands, whatsapp bot image is attached below with results.



As we can see from the above image our bot is working well and we gave 2

commands to check two different types of news. By using !link command we passed the article URL and it tells us whether our article is fake or not, as we can see in the result it gives accuracy of 31% and gives us the result as ‘UNSURE’. We also use !text command followed by text to check the given text is true and not and for checking it bot takes the text as a string and searches on its dataset for finding the relevant answer and tells us whether it's fake or not.



We have more features like !help command which gives us Bot usage instruction and Guide. We have a feature called !alert which will be used for sending alerts directly to police. It's like a SOS feature.

References:

1. *https://www.twilio.com/whatsapp*
2. *https://www.whatsapp.com/coronavirus/get-started-business/?lang=fb*
3. *https://www.kaggle.com/clmentbisaillon/fake-and-real-news-dataset*
4. *https://www.kaggle.com/c/fake-news/data*