

International Journal of Engineering Sciences & Research Technology

(A Peer Reviewed Online Journal)
Impact Factor: 5.164



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ABSTRACT

In the present scenario it is observed that 66.60 percent population of the world has a mobile device (cell phones, tablets and other mobile devices). Billions of users are using the social media across various platforms like Facebook, Whatsapp, Twitter, Instagram etc. But simultaneously, the Internet crimes and frauds are increasing rapidly day by day across the world in which the social media platforms are playing a vital role. Criminals use mobile phones as a partner in their crimes. They use social media platforms for criminal motive. To hold-up and to trace the criminals, the investigation agencies try to find out the locations of the criminals by tracing their mobile numbers using CDR analysis, IP address analysis and other methods. But the criminal have been intelligent now and using the new technologies to hide themselves. The criminals use social media accounts for calling and chatting so that police or other investigation agencies cannot trace them easily. In such conditions, it was felt necessary to develop such a tool that can facilitate the investigating agencies and police personnel to trace the criminals easily. Therefore, a tool named SNUFF is developed by the authors that can help the police and other agencies to trace and find out the exact location of the person or the criminal who has been using the social media sites for his ill intentions.

KEYWORDS: Location tracking, location trace on social sites, facebook loction, longitude, latitude.

1. INTRODUCTION

At present a large number of youth are available on social sites. According to a survey [4], the internet users spend an average time of 2 hours and 22 minutes per day on social networking and messaging platforms. They post their stories, views, and much other information on social sites. The police monitor to these social sites because many criminals also post their stories, and share their photos, so it is easy way to track the criminals for the police. Social media monitoring technologies give real-time information about possible victims, criminals or recent crimes, and criminal's location from where the information was posted. The police also monitor the social sites and collect important data and other posting critical data on Facebook post, Instagram photos, twitter, YouTube videos. The police may collect an ample amount of information by social media which may prove to be a potential evidence in investigation. Nowadays the criminals use social media platforms to commit crimes and other criminal activities because the social media platforms are the safest and easy way to run criminal activity smoothly. The criminals purchase mobile numbers or use fake internet phone numbers and they use these phone numbers to create fake social media accounts (Whatsapp, Instagram, Facebook etc) and thereafter, they do not use these particular phone numbers. Using this strategy they commit crimes like threatened internet calls, viral violence inciting news etc and hide themselves in safe place. After this they keep themselves in contact with some reliable persons via social media to keep watching on police investigation. In these cases they use social media accounts for calling and chatting but they do not use any active mobile numbers so that police cannot trace their location easily. Generally the Police and investigation agencies use some of the analytic methods to trace out the criminals such as-

- IP address analysis: Police or investigation agency writes a letter to social media Platform Company to provide the details about particular account like IP address, phone numbers, email id etc. If the social site company provides the IP address of particular account then it will be the public IP address which was

provided by one ISP (Internet service provider) company to their user. Now the police request to ISP for providing the phone number or location of particular date and time for the IP address. It is possible that ISP could have assigned the same IP address at the same time to many users across the country then the police have to filter all the provided phone numbers and retrieve the criminal's phone number or location but it is not an easy task to filter out the phone number or location of the criminal.

- **CDR Analysis:** Call detail record analysis is very common method which has been using by the police personnel. In this method the police get the call details (Incoming/Outgoing) record of particular phone number from Telecom Company and try to establish a link between phone numbers which can be useful in the investigation.

2. VARIOUS SOFTWARE FOR LOCATION TRACKING

There are various locations tracking software available at present. Some of them provide only user's identity or the location from where SIM card is registered. Others give real Location of users in particular city and area. Here we are briefing some location tracking methods:

- Location tracking through Mobile Number:** If someone wants to get details of unknown numbers then the available tools can provide the details about particular phone number. Truecaller, Mobile number tracker and many other online tools provide the service to find out the detail of particular phone number. These tools can provide the name of the user of the phone number and the location (name of the city or state) from where the SIM card is registered. All available tools cannot give the exact location of particular phone number [5].
- Location tracking through Facebook:** Facebook provides the function to find out the location of the friend if he/she activates the setting of location on facebook. Those who activated the function; will regularly receive the notifications of the closeness of their friends. These notices will also appear in their news feed [6].
- Location tracking through spy applications:** Many spy mobile applications (Spy human, The truth spy, XNSPY etc.) available in the market and by using them the location of any one can be trace out. First, it is necessary to install that spy application in the targeted mobile phone then the location can be trace otherwise not.

3. PROPOSED WORK

The proposed work was focused on developing the tool named SNUFF to find out exact location of the criminal via internet or social media. The tool would be helpful for the police investigations.

The SNUFF (fig.1) traces the location of mobile device by enabling the GPS of the mobile phone and extracts the longitude and latitude [7] of particular place. Ngrok tunnel (fig.2) is used to create a link [3]. Accuracy of the received information is accurate to approximately 30 meter.

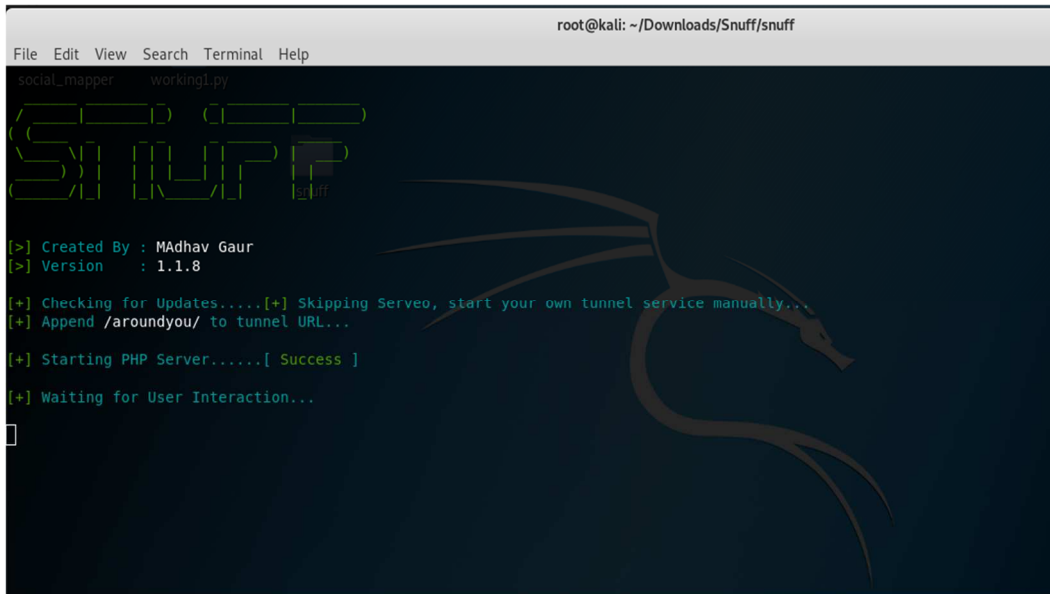


Figure 1: Snuff: Home Page

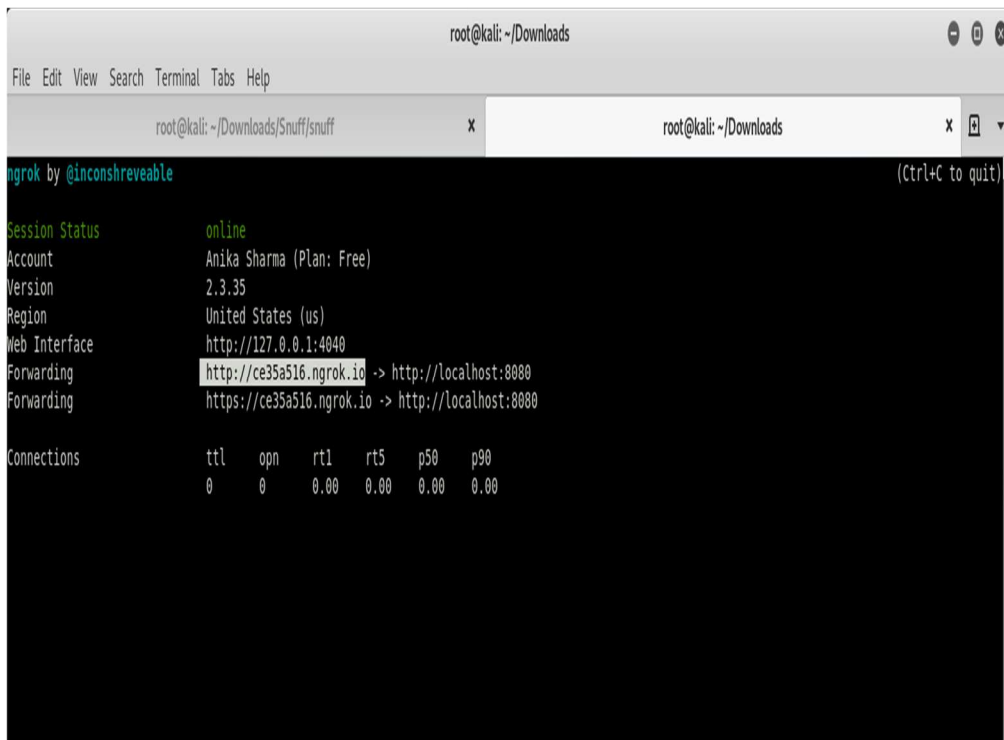


Figure 2: Ngrok: Tunnel Service for create link

4. METHODOLOGY

In this tool a web page (fig.3) is created to get the location. The web page creation depends on the interest of the target. Before retrieving the location of the target, first the investigator has to work on the social engineering of

the target. It is better to about the interest of the target because a person reads or watches only those things which are related to his/her interest.

To find out the location of the target, a message is created which must be related to target's interest for example, if the target likes to make friendships with the unknown person then create a message '**Check this website to make the friends around You**' and sends to the target with the link of web page. When the target clicks on that link, the web page will be opened and it will ask to enable location service (fig.4). If the target enables the location permission then the longitude and latitude of the location will be retrieved.

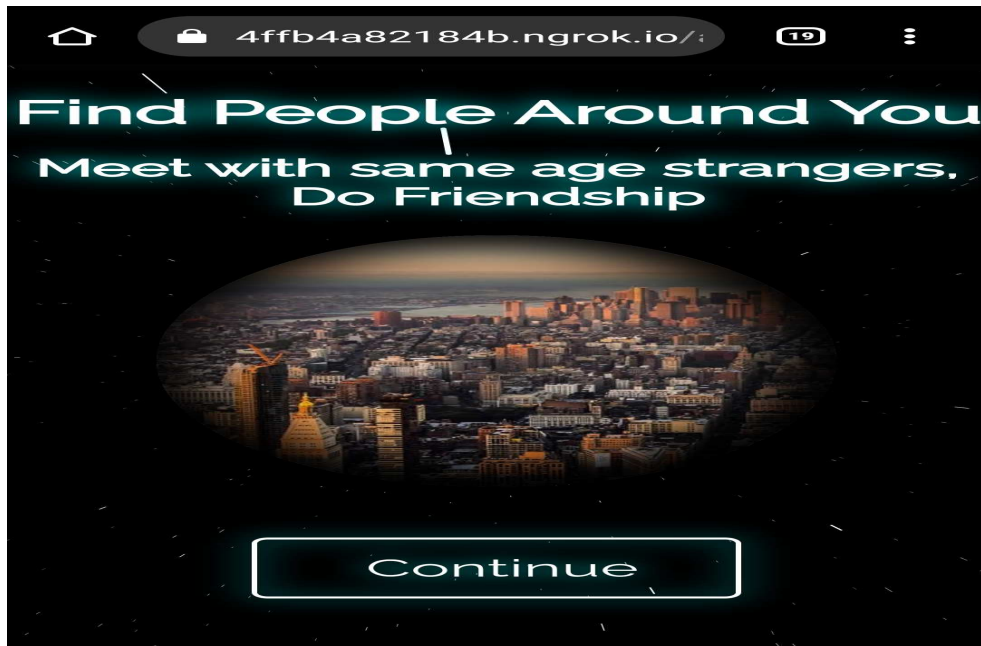


Figure 3: Created Web page

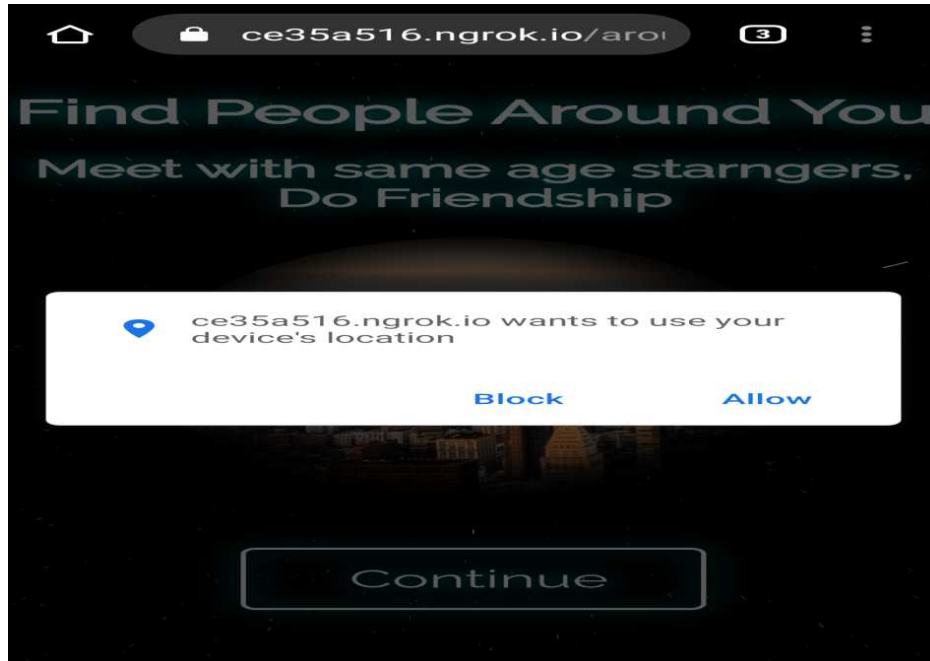
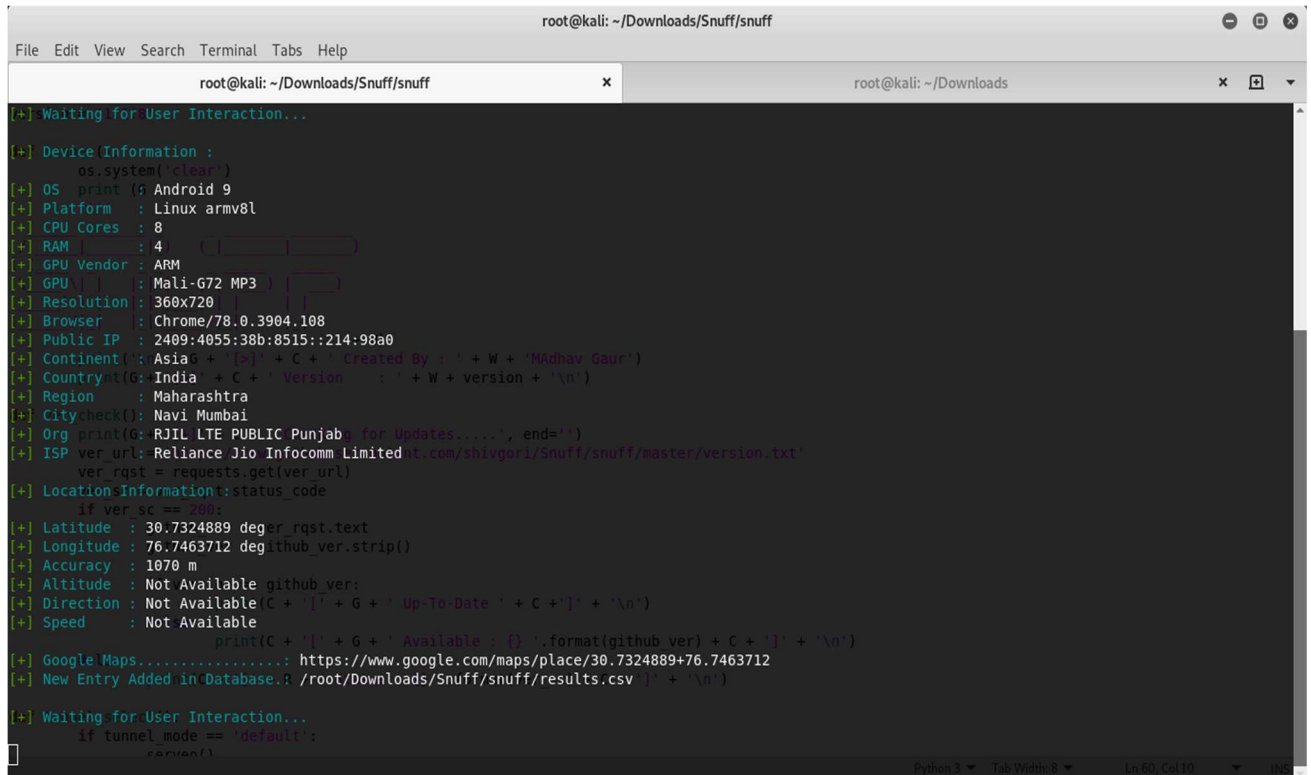


Figure 4: Web page asks Location Permission

If the target allows the location permission then the tool retrieves the following information (fig.5):

- Longitude
- Latitude
- Accuracy
- Operating System of the device
- Browser
- Continent
- Country
- Region
- City
- ISP Name
- Public IP Address

By using longitude and latitude we can find out the location of the target.



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root@kali: ~/Downloads/Snuff/snuff
File Edit View Search Terminal Tabs Help

root@kali: ~/Downloads/Snuff/snuff x root@kali: ~/Downloads x [ ] v

[+] .Waiting for User Interaction...
[+] Device Information :
    os.system('clear')
[+] OS      print(' Android 9')
[+] Platform : Linux armv8l
[+] CPU Cores : 8
[+] RAM      : 4
[+] GPU Vendor : ARM
[+] GPU      : Mali-G72 MP3
[+] Resolution : 360x720
[+] Browser  : Chrome/78.0.3904.108
[+] Public IP : 2409:4055:38b:8515::214:98a0
[+] Continent : Asia + ' ' + C + ' created By : ' + W + 'Madhav Gaur')
[+] Country   (G: India + C + ' Version : ' + W + version + '\n')
[+] Region    : Maharashtra
[+] City      check(): Navi Mumbai
[+] Org      print(G: RJIL LTE PUBLIC Punjab for Updates.....', end='')
[+] ISP ver_url: Reliance Dio Infocomm Limitedht.com/shivgori/Snuff/snuff/master/version.txt
    ver_rqst = requests.get(ver_url)
[+] Location Information:status_code
    if ver_sc == 200:
[+] Latitude  : 30.7324889 deg r_rqst.text
[+] Longitude : 76.7463712 deg thub_ver.strip()
[+] Accuracy  : 1070 m
[+] Altitude  : Not Available github ver:
[+] Direction : Not Available(C + ' ' + G + ' Up-To-Date ' + C + ' ' + '\n')
[+] Speed     : Not Available
    print(C + ' ' + G + ' Available : ' + G + ' ' + '\n')
[+] Google Maps.....: https://www.google.com/maps/place/30.7324889+76.7463712
[+] New Entry Added in Database.: /root/Downloads/Snuff/snuff/results.csv |' + '\n')

[+] .Waiting for User Interaction...
    if tunnel_mode == 'default':
        server()

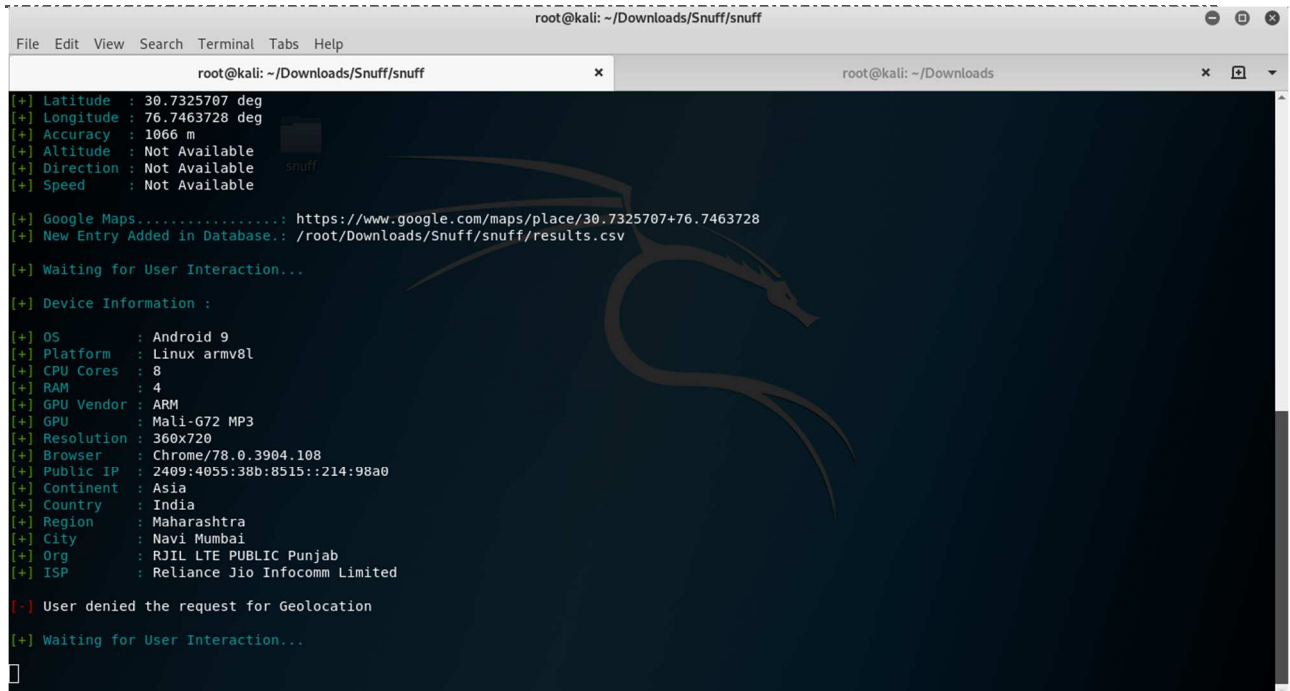
```

Figure 5: Longitude & Latitude

If the target denies the request for location enable:

For example, if the target is using social networking sites and police do not know about his/her location or phone number which the target is using, then the investigator sends a message with the generated link to the target. When the target clicks on the link and open the web page then web page asks for enable the location service but target denies it. In this condition SNUFF retrieves the following information (fig.6):

- Operating System of the device
- Browser
- Continent
- Country
- Region
- City
- Internet Service Provider (ISP) Name
- Public IP Address



```

root@kali: ~/Downloads/Snuff/snuff
File Edit View Search Terminal Tabs Help
root@kali: ~/Downloads/Snuff/snuff
[+] Latitude : 30.7325707 deg
[+] Longitude : 76.7463728 deg
[+] Accuracy : 1066 m
[+] Altitude : Not Available
[+] Direction : Not Available
[+] Speed : Not Available
[+] Google Maps.....: https://www.google.com/maps/place/30.7325707+76.7463728
[+] New Entry Added in Database.: /root/Downloads/Snuff/snuff/results.csv
[+] Waiting for User Interaction...
[+] Device Information :
[+] OS : Android 9
[+] Platform : Linux armv8l
[+] CPU Cores : 8
[+] RAM : 4
[+] GPU Vendor : ARM
[+] GPU : Mali-G72 MP3
[+] Resolution : 360x720
[+] Browser : Chrome/78.0.3904.108
[+] Public IP : 2409:4055:38b:8515::214:98a0
[+] Continent : Asia
[+] Country : India
[+] Region : Maharashtra
[+] City : Navi Mumbai
[+] Org : RJIL LTE PUBLIC Punjab
[+] ISP : Reliance Jio Infocomm Limited
[-] User denied the request for Geolocation
[+] Waiting for User Interaction...

```

Figure 6: Information without Longitude & Latitude

The above information is very useful to trace the target. Public IP, Internet Service Provider name, city/region will be very useful to trace the target. The Police or the investigation agency asks the details about the desired public ip address of the particular region from the internet service provider (ISP). The ISP has to provide the phone numbers details related to particular public ip to the police and on the basis given phone numbers the Police can trace the location of the target.

5. CONCLUSION

Social media is immensely popular, allowing users to share their lives in new ways. Many social media platforms allow users to share their locations. But some of the social media sites care about their user's privacy. These social media platforms do not provide the data related to their users to the police or other investigation agencies. So it is very challenging for the police to find out the location of the criminal who uses the social media platform.

This tool SNUFF is developed for helping the investigating agencies and the police department in their investigations. This tool can help to find out the location of the criminals who use the social sites for their criminal motives. This tool reduces dependency of police on social media sites.

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