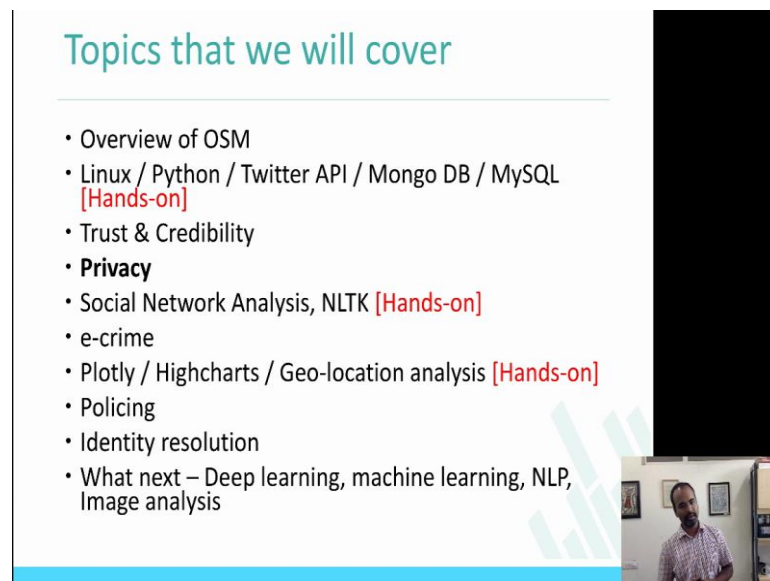**Privacy and Security in Online Social Networks**
**Prof. Ponnurangam Kumaraguru ("PK")**
**Department of Computer Science and Engineering**
**Indian Institute of Technology, Madras**

**Week - 5.1**
**Lecture - 16**
**Policing and Online Social Media**

Welcome back to the course Privacy and Security in Online Social Media, this is week 5. Hope you have enjoyed the course by doing the home works, doing some of the exercises that we are talking in the class and generally also getting excited about the course.
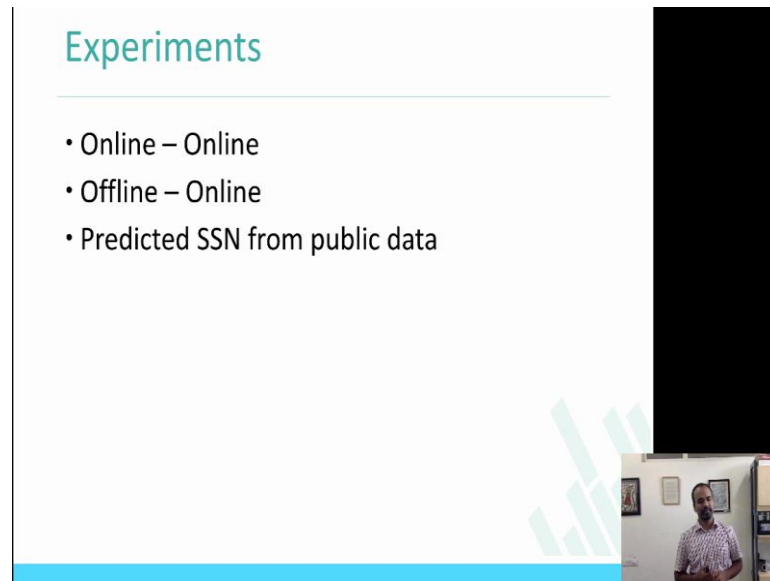
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This is the general overview of the course ,we are looking at the topic of privacy now.
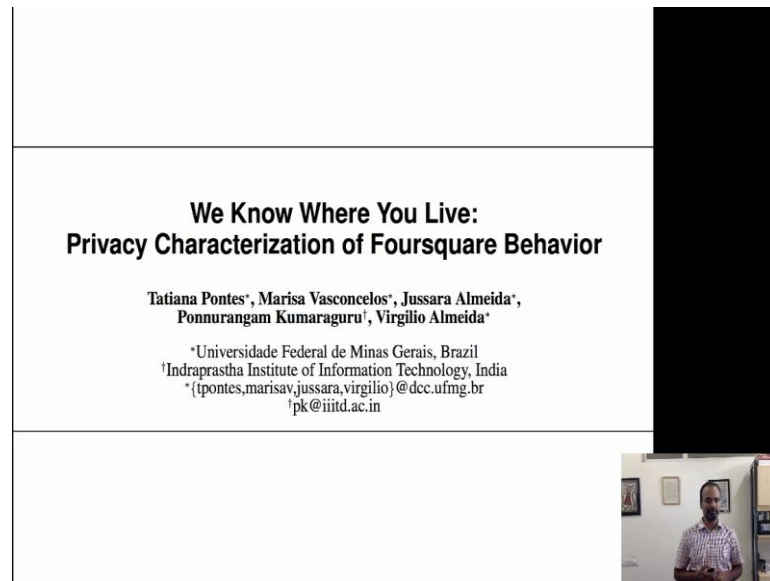
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Last time in the week we saw the content about privacy and how privacy implications are going on Online Social Media, in particular we saw some experiments where they are done, an analysis of data from online and online, offline and online and sometimes looking at predicting the Social Security Number also. The online and online study that they did was to take up data from Shaadi dot com type of sites like Match dot com compare it to Facebook pictures, then see whether they were able to identify people from this matches. Offline and online, they took pictures of students walking around on campus and compared to their Facebook profile and then, said that this is your profile and then got some confirmation about the pictures that they downloaded from Facebook.

They use this publicly available data online, offline, all the data to predict actually Social Security Number and they were successful in predicting 1 in 10 percent of the data that they saw with some confidence of the five digits of Social Security Number. So, that is a kind of thing that we have seen until now.

Let me tell you few things more about privacy on Online Social Media and then we move on to another topic this week. It is not only that pictures, and you can use these information from social media, but you can actually use something more specific information like a location also to find out where you are and where you have been moving around and things like that.

Here is one study that researchers have done to show that privacy information from Foursquare which is one of the location based social networks, one of the very popular location based social network. Data from Foursquare can be actually used to find out where you live.

These two research which wass done back to back is to inferring home location from the check ins that you do in foursquare. I am not going to get into details of study that is why I put the pointers to the papers, but I will talk you in general how this was done, how this could be done, and how you can actually look at some of the data yourself also.

Foursquare is one of the popular online social networks, just for locations it is called location based social network. The different topics and different concepts in foursquare are check ins. Check ins is, you check in to the hotel, you check in to the airports and similarly you check in to a location in foursquare and you can actually also leave a tip, let us take if I go to Sarvana Bhavan, Connaught Place in Delhi. I have food there and I can leave a tip saying that food was pretty good. And you can also become a mayor in foursquare which is, if I visit this place, if I visit this location in foursquare the most number of times in the last 60 days, I become the mayor of this location.

The mayor information can be actually pretty useful. Today organizations are monetizing this check ins and mayorship in foursquare. Also someone actually is providing you free parking spots if you are a mayor of that location for the week. This information that is you check in can actually be used to find out your location, your home location also. People have studied other things, people have studied actually from the pictures that you

upload can I actually find out your home location. This work is specifically focused on finding out the home location from social networks like foursquare, and there was a high confidence in finding out the home location with the foursquare check ins that people have done.

Mobility of people is actually not that much. Another conclusion that they also found was people do not move a lot from their current location. With this information like check in, mayorship, they were able to actually find out with the high confidence the home location of the person within few kilometers of distance of error.

Therefore, social network data privacy, initially we saw some survey where people actually said about their information of the social networks, then we looked at some studies where pictures uploaded on social media and pictures uploaded on these publicly available websites which they called as unidentified sources can be actually used to find a person specifically or uniquely identify an individual. So here I am saying that your location can be also inferred from the social networks like foursquare.
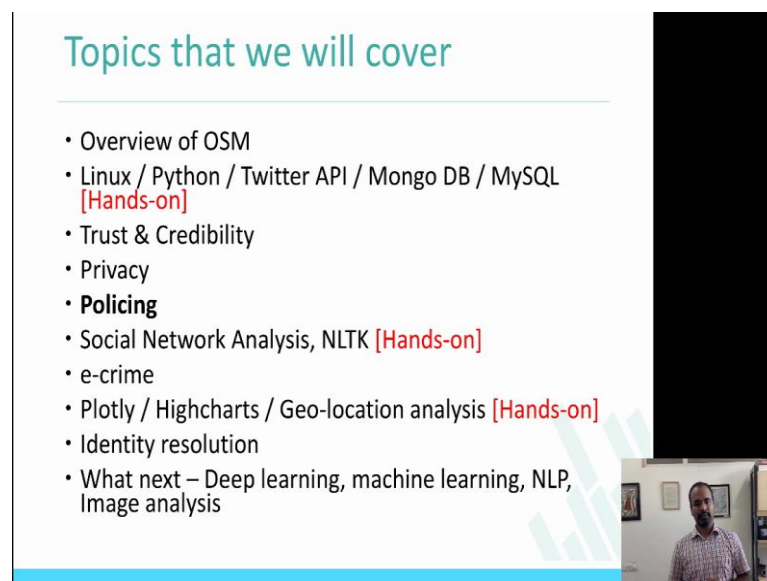
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Interested?

- WWW http://www.www2017.com.au/
- ICWSM http://icwsm.org/2017/
- COSN http://cosn.acm.org/
- CSCW https://cscw.acm.org/2017/
- ...

If you are interested more in this topic I actually high recommend you to get some of these pointers, which is these are all the conferences where the topics of privacy and

security in Online Social Media in general also gets published, but also specifically about these topics like, image analysis connected to the data from the web, pictures which is what we talk about and location and things like that. WWW - which is one of the top tier conferences in internet space; then, there is conference on web and social media which is ICWSM. Then there is conference on online social networks and there is also collaborative work which is CSCW.

These are not the comprehensive lists, these are just to tell you that if any of you is interested in looking at these topics more, you should probably be looking into these pointers. And of course, if there is any questions feel free to drop it on the forum.

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Now, I thought I will actually move on to another topic given that we are in the week 5 we should actually start looking at other topics also in the course.

So, until now you have done general overview of Online Social Media some Linux, Python, technical topics like trust and credibility which just looked at privacy. So, what I thought I will do now is about spending this week's content mostly on topic called policing.

I would definitely like to hear from students in the class about how you use online social media particularly the kind of questions that I have in the slide. How many friends and followers do you have on Facebook and Twitter? If you can post all this in forum it will be nice to see how the participants of this course are actually using Online Social Media.

How many of you are friends with the police on your social network? Police, I mean Police Organizations; how often do you use social network to post comments or interact with police? And of course, the question that I'm going to be trying to address in this week content is actually what has police been using Online Social Media for, what have they been doing, what can they do, how we can actually help, how people using social media like you and me can actually participate with the police in online social networks.

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I do not know how many of you have seen this picture before, but this is the first time ever the social media was actually used to attack crisis, to actually find out what is going on in real world before people actually, before the first responders, before police actually got to it. This is US airways airplane that landed on Hudson river and you could see people are actually trying to get out or people trying to help. But the first picture and the first tweet that came out, but this picture was actually a person walking on the riverside posting a picture saying that 'I am going to actually go help them.'

First until then this was in 2009 until then, the social network Twitter or any other social network was actually mostly used for talking to each other, saying what they are doing, hash tag Monday morning, things like that, were the once that were used to talk on social networks like Twitter and Facebook. Whereas, first time it was used to solve the problems, solve the crisis is actually this one.

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And of course, there the police is being part of the social media, social networks for some time now. Here is my example where it became very interesting. So, hash tag myNYPD, is the hash tag that NYPD police posted saying with this tweet 'do you have a photo with a member of NYPD, tweet us and tag it, with myNYPD. It may be featured on our Facebook page. This came out on Twitter and they said that we can actually post the pictures on our Facebook account. Interestingly, with this hash tag they started getting pictures like this.

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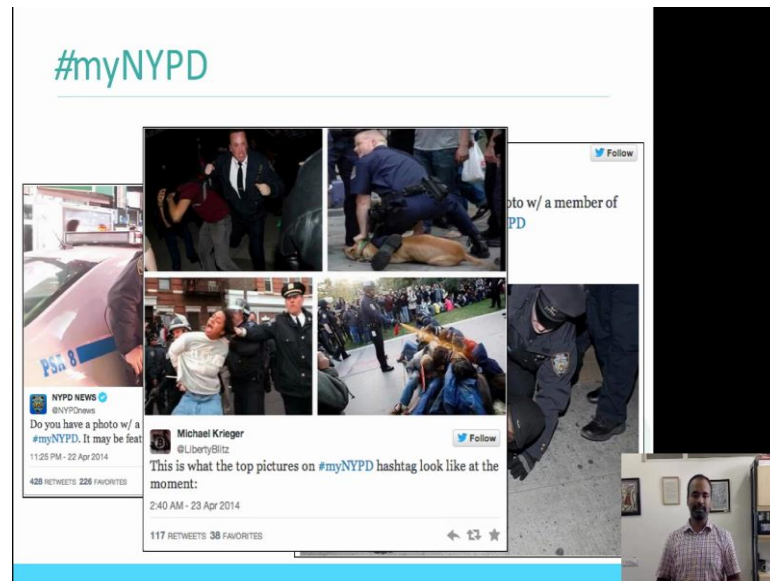


It is not only like that they got pictures like this which is from my NYPD.

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But interestingly there were also pictures, this hash tag went from myNYPD to myLAPD. The point here is that, these kinds of strategies that police use is also happening on Online Social Media which is to take up the hash tag, get public to

participate and uploading the pictures and of course sometimes you get different kinds of pictures than what they meant or expected.

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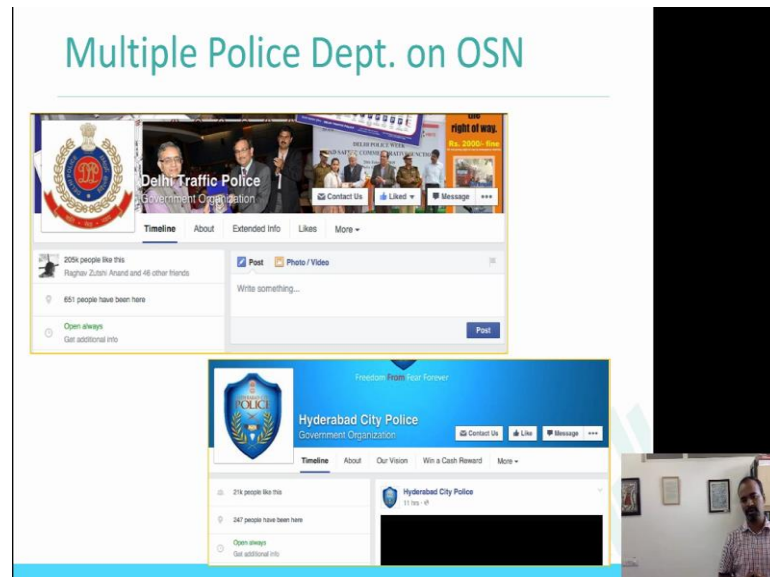


Let us come back to the Indian context. In the last few years probably last one and half or 2 years there is a lot of adoption of Online Social Networks, Online Social Media services in India also. Here are some examples, I am going to go through a lot of accounts, handles which has been using Online Social Media in the last few years. And then, over the process of actually talking about these handles I am also going to inject some technical topics in terms of what are the problems, how actually people talking this course and people understanding the social networks technically can also help in identifying these problems. The one on the top left is actually Delhi traffic police, the one on the bottom is actually Hyderabad city police. I will actually show you more details about examples also pretty soon.

Here is the general way by which Police Organizations are actually using the social media services. This is a Facebook page of Bangalore City Police. In India now, Bangalore City Police, Bangalore Traffic Police, Delhi Traffic Page, these are the very popular handles in the country now. And that is why you will get, teaching this particular course is actually pretty exciting for me, it is because we are actually looking at topics which are very rather relevant, I mean just open your Facebook now and look at Bangalore City Police you will actually look at some of the things I am talking now. Bangalore City Police is the verified page you can see a blue tick next to the top left of Bangalore City Police.

And there is about thousands and thousands of likes this picture that was taken some time back I am sure the likes have changed now. And in the bottom the picture showing you an example of a typical post that comes from these kinds of police pages. The post says that 'we are taking up traffic signals synchronization on 10 corridors in the city for smooth traffic flow' and it is coming from handle AddICPTraffic. So the idea is that citizens can inform about what is going on in the decisions that they are making.

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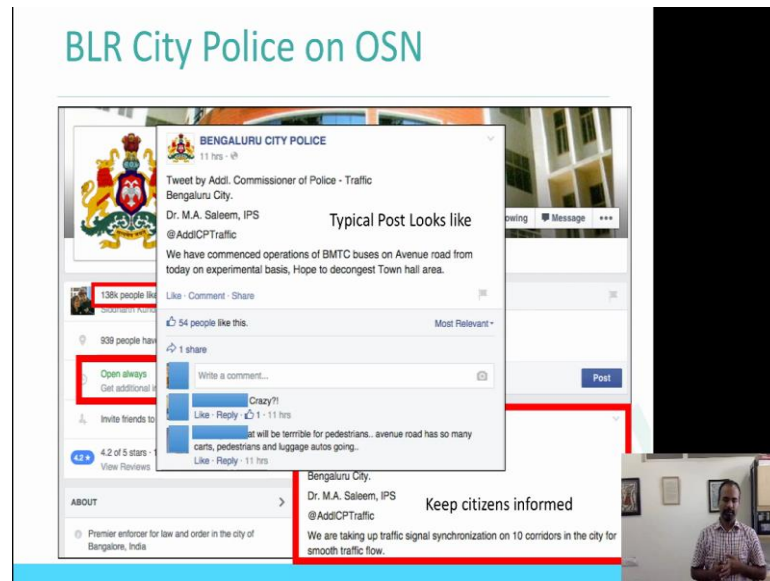


And you can of course see a number of likes, people interacting with these posts, with the Police Organizations.

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So CPBLR, at CPBLR is a handle that got very popular about one and half years before.

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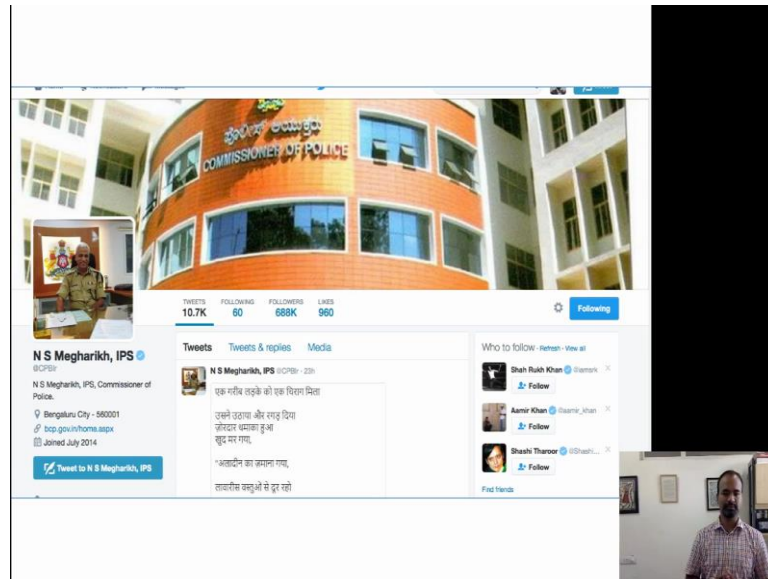


This is the current account of CPBLR, it has a part I just took the screenshot a few minutes before actually preparing this deck of slides. It is about 10000 tweets, the account is following 60 people and about 688,000 people are actually following this account. Then this shows that this account is actually very popular.

For example, probably I took the screenshot a year or sometime before I took on 28th last year probably and it says about 335,000. And now it is actually August 2016 it is about 688,000. The activity of this account is actually very high and the number of followers; the interaction that this account has with citizens is also pretty high. Therefore, they gain a lot of followers.

So, what we are going to be looking at this is, how these accounts are doing, in specific we will also look at some data that was collected to analyze Bangalore data itself.

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## Popular departments

| Police Departments | Likes | Followers | Post | Joined |
|---|---|---|---|---|
| **USA** | | | | |
| New York | 383,372 | 147,000 | No | 2012 |
| Boston | 137,403 | 312,000 | No | 2010 |
| Baltimore | 36,530 | 70,400 | Yes | 2012 |
| Metropolitan, Columbia | 16,071 | 56,900 | Yes | 2008 |
| Seattle | 12,912 | 103,000 | No | 2010 |
| **UK** | | | | |
| Greater Manchester* | 98,193 | 205,000 | Yes | 2011 |
| West Midlands* | 86,904 | 115,000 | No | 2008 |
| Essex* | 66,461 | 85,300 | No | 2011 |
| London* | 46,889 | 267,000 | No | 2011 |
| Northern Ireland* | 26,173 | 71,300 | No | 2009 |

Just to give you a sense of how the Police Organizations around the world are. Police organizations like New York, Boston, Baltimore and many, many other cities have actually adopted Facebook's and Twitter's. Here we are just showing you the Facebook which is likes and followers. The common post and joined is that joined is the year that they started. Post is whether they are allowed to actually post the content on the Facebook page, because on Facebook you can actually control whether the people who have liked the post or people who are accessing this page can actually post on to the page.

In UK also there has been a lot of adoption of Facebook. Of course, if one is interested you could actually look at this topic more closely and do a lots of analysis on analyzing the post, analyzing the content that is going on online social network, both in the police in context. If any of you are interested in doing it, if any of you are interested in looking at this problem more closely I will be happy to actually chat with you.

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## Popular departments - India

| Police Departments | Likes | Followers | Post | Joined |
|---|---|---|---|---|
| Bangalore Traffic | 2,49,968 | 8,045 | Yes | 2012 |
| Delhi Traffic | 2,02,858 | 2,59,000 | Yes | 2011 |
| Hyderabad Traffic | 1,88,480 | 1,361 | Yes | 2012 |
| Bangalore City | 1,05,463 | 12,100 | Yes | 2011 |
| Kolkata Traffic | 63,789 | - | Yes | 2010 |
| Chennai | 50,979 | 1,108 | Yes | 2013 |
| Gurgaon | 43,901 | 718 | Yes | 2013 |
| Gurgaon Traffic | 24,475 | - | Yes | 2010 |
| Hyderabad | 13,602 | 537 | Yes | 2014 |
| UP Police PR | 8,486 | 4,585 | Yes | 2013 |
| Guwahati Police | 3,255 | 295 | Yes | 2011 |

So, here is the situation what is in India now? This is slightly outdated data but I think this is Bangalore, Delhi Traffic Police which are actually popular, and of course many cities have actually adopted getting on to Online Social Media and particularly Facebook and Twitter.

There is a little bit of YouTube but I think YouTube is pretty small. In our case the accounts have probably started after 2010 or 2011 and all the pages that are created in India for using for policing allows citizens to actually post on these pages.

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Let me walk you through this some city police handles and then look at what kind of things that they do on these handles. This is Bangalore City Police, Bangalore Traffic Police, Facebook and Twitter page, this is a typical police I told you about traffic earlier the other post that they could do is something like this which is cash reward of Rupees 10 lakh for helping them.

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This is Delhi traffic. Again Delhi traffic, Twitter and Facebook pages. This is the kind of post that the Delhi police also does in terms of traffic, in terms of actually appreciation of their police force, their police officers.

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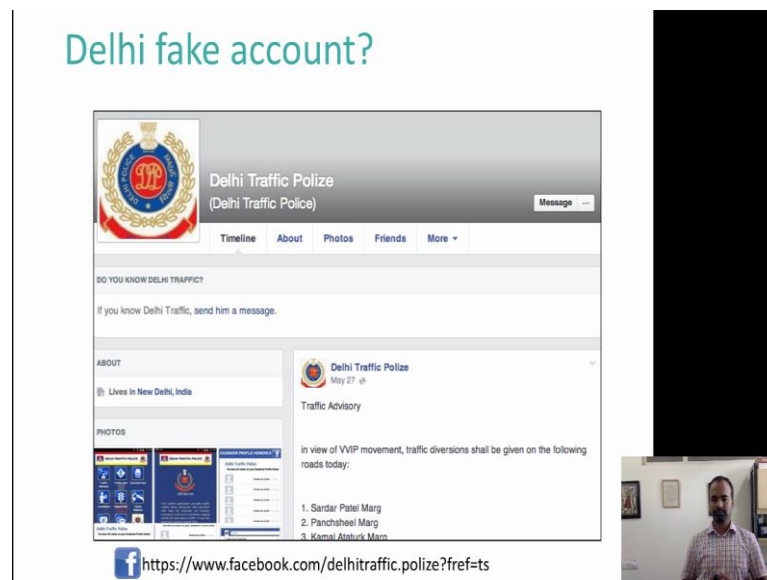


Interestingly, there is not only that these handles have been managed by these Police Organizations, there are also fake handles that are being generated because of using of social media by Police Organizations also. I think it is typical problem that technologists like students who are taking this class should probably look at.

What are the ways to actually identify this kind of fake content? First of all even to identify whether there are fake handles, 500 accounts which are doing the similar things that the Delhi Traffic Police page is doing or any other Police Organizations. Wherever you are from meaning I am sure the cities like you are sitting in and looking at these lectures you could probably look at whether the Police Organizations in your state, in your city has a Facebook page or a Twitter page and see what kind of activities that they are doing.

It will be interesting if some of you actually post about your own city or state police organization activities on the forum. It will be interesting to look at what Police

Organizations are actually doing. Maybe, by looking at these topics for sometime you will get a sense but I think if you are a localite you will probably also understand what is going on. In this case, the slide that I have here which is Delhi Traffic Police - p o l i z e is a fake account and there are many, many accounts like these for a different Police Organizations.

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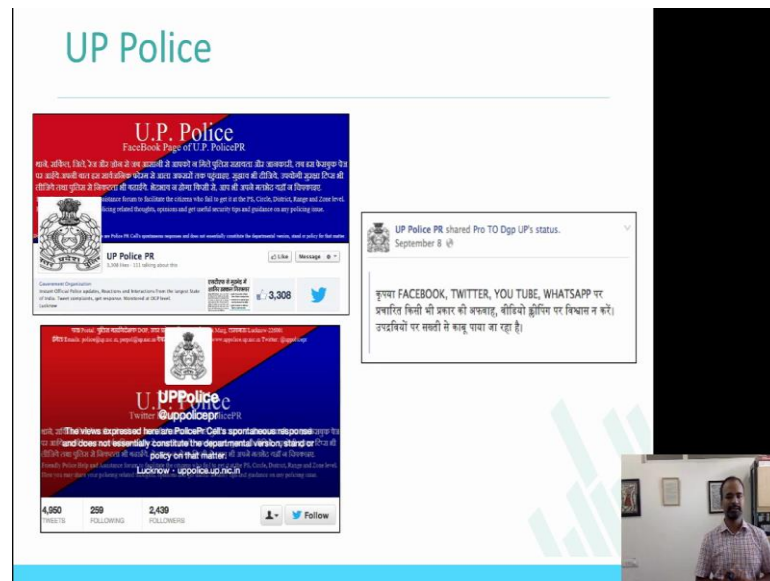


Here is UP Police. UP Police also has a Facebook page and a Twitter page and they also seem to be talking more about the activities in terms of traffic in terms of helping them and in terms of generally interacting with the citizens.
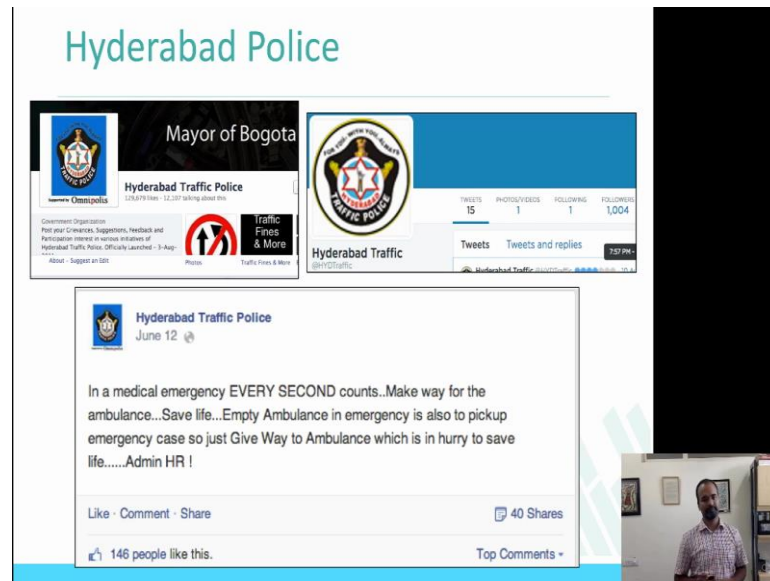
That is Hyderabad Police of course.
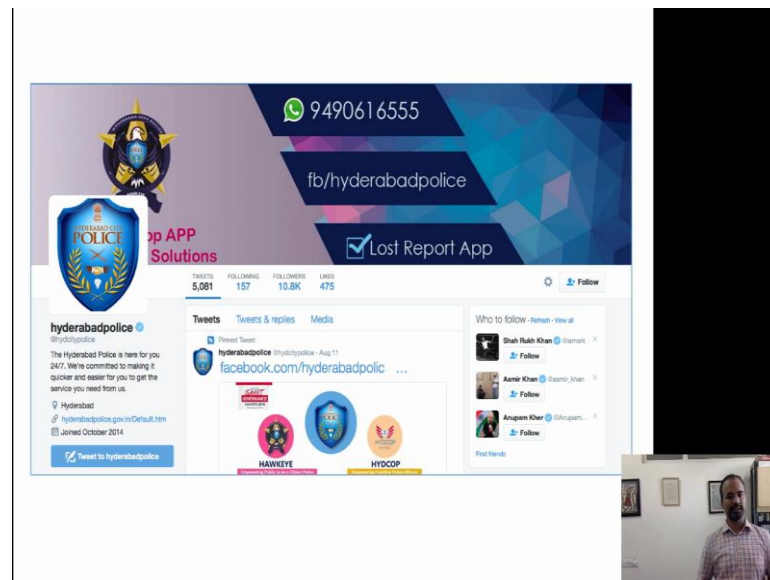
This is the Hyderabad Police recent Twitter handle; I just took the screenshot few minutes before again. This is also a verified account; I will come back to this verified account in few minutes. But I think let me just highlight what a verified account here is,

the blue tick mark next to Hyderabad Police here is the verified account; says that this account is verified that is, Twitter has verified this is really the Hyderabad Police.

It is not that easy to get a verified account, not all accounts on Twitter are verified; only a little fraction of users on Twitter are actually verified, I think it is about a million users now. These verified accounts are very helpful because I think for Police Organizations to say that who they are is actually very, very necessary.

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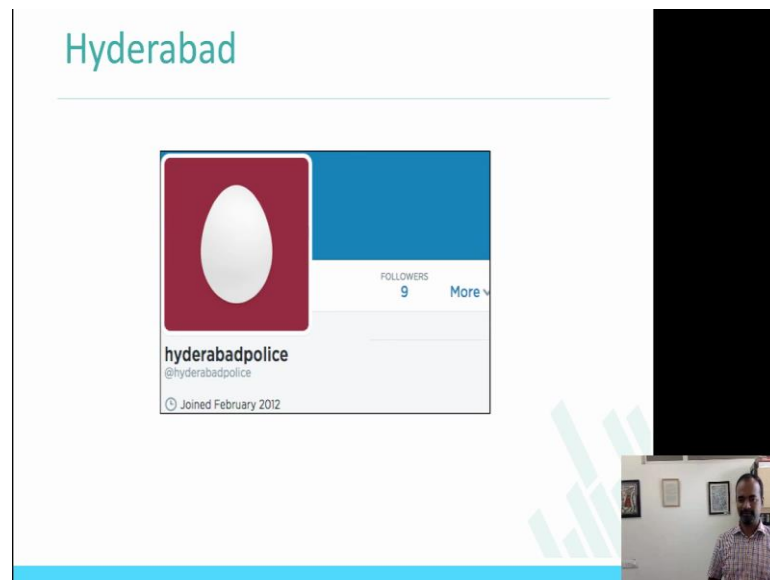


Just to show you this is Hyd City Police which is the real verified account, but as there are actually accounts like Hyderabad police which does not even have profile picture changed; this is called an egg profile in Twitter terms, and you can see this handle has been from 2012. Sometimes, this handle may not exist now but I think when we were analyzing, we keep track of some of these handles also.

Sometimes, some states have taken the decision of all the states and all the city police will have just one page, and then everybody will be posting content and interacting only through that. Some organizations have taken the decision of having multiple pages for at the district level for different activities.
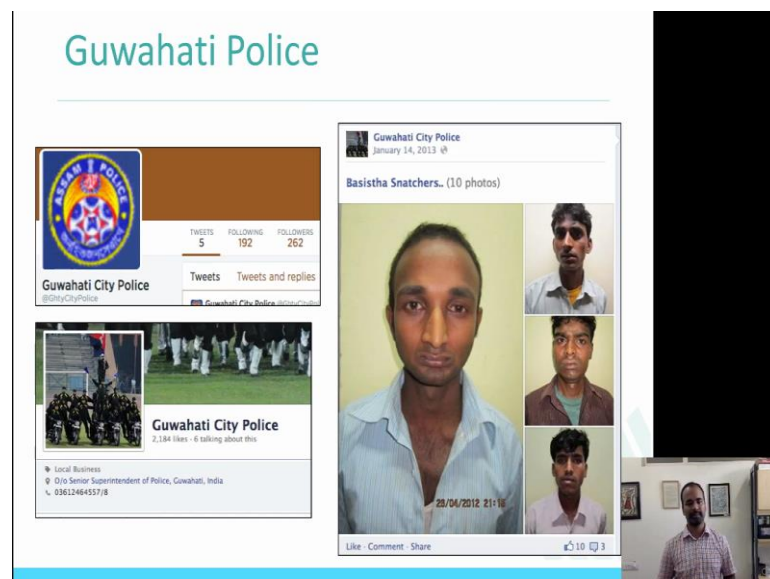
Guwahati Police.

Kolkata Police. I think Kolkata Police also there is a interesting handle which is on the second from the top on the left which says Kolkata Police, fake Kolkata Police twitter, and then a smiley. Therefore, there are these kind of problems where Police Organizations handles have been mimicked, mastibated to create accounts and see if you can see it actually has at Kolkata Police; the profile picture that it is using is probably the same as a legitimate Kolkata Police account also.

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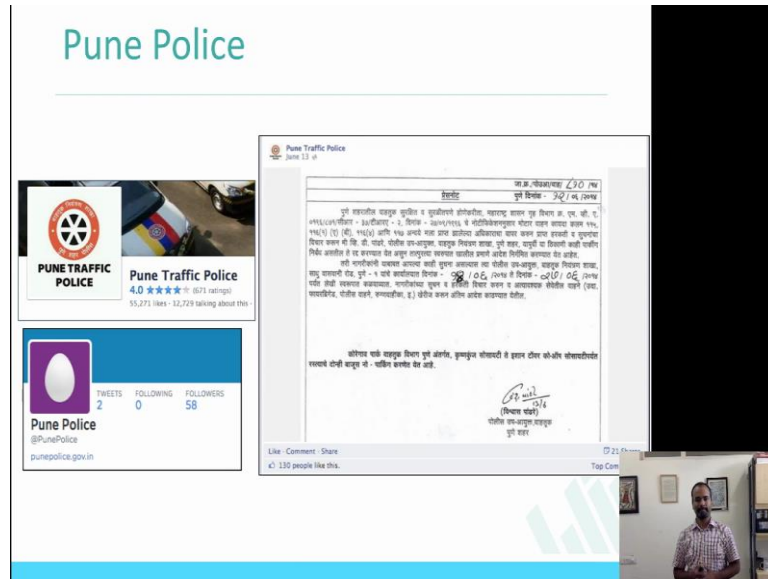


Pune Police. Again Pune Traffic Police, Pune Police and it is actually very hard to verify, even for us, even for anybody, even when you go to get your own cities or state police pages as I said now, you yourself will find it hard to get the actual real account which unless it is verified is going to be a very hard to actually justify or find out whether they are legitimate.

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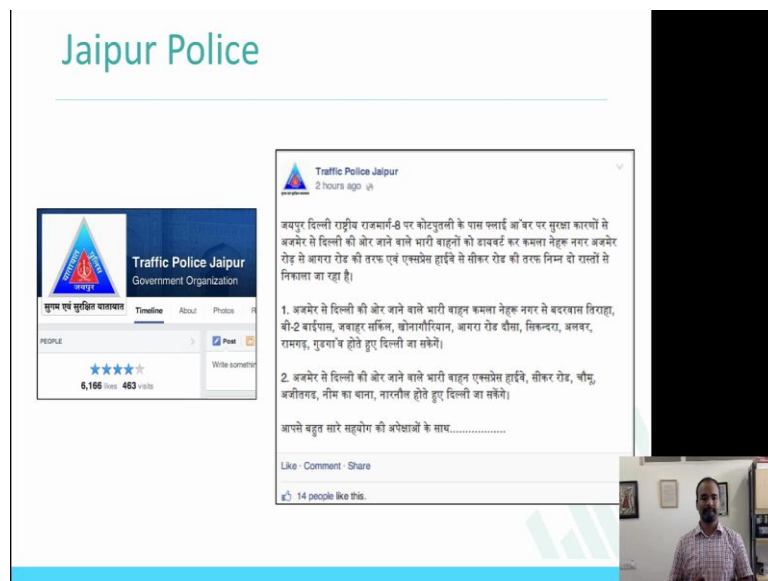
This is Traffic Police Jaipur.

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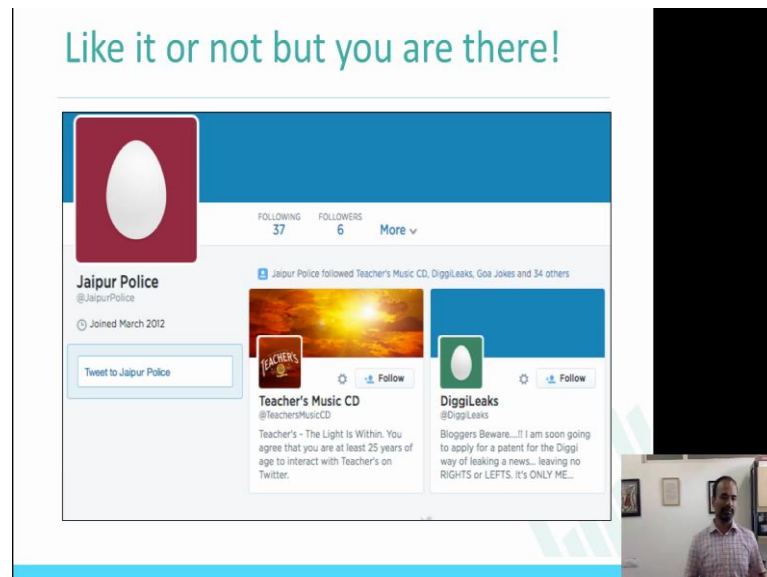


I am just giving you vulnerant tour of some of the handles that we have found. The thought here is that whether you like it or not, whether as citizens want to see their accounts Police Organization accounts in these networks, the accounts are created like I have taken police there are many other polices; it's not clear whether these are actually the Police Organization handles.

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Here is a quick one in terms of Mumbai Police, at Mumbai cops, it iays protecting and serving Mumbai; keep updated with latest news on how we are combating crime, fear and disorder in the community. It is not clear whether it is a legitimate account. And then there is Chetan Gavali at Mumbai Police, Delhi Police too there is a handle.

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There are multiple handles like this. So, one thing when we were looking at these handles we realized is that, hard to find out which is legitimate and which is not legitimate. That is when we created this page in capturing all the State Police Organizations and City Organizations, their Facebook pages, Twitter handles and the source from where we are actually getting this information.

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So, now let me walk you through the website that I have just now mentioned which is looking at different handles. If you see here, we have been capturing different State Police Organizations, their Facebook pages and their Twitter handle. Source column is basically to show that whether we were able to confirm whether this is the legitimate handle.

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So you can clearly see there about 80 pages in 80 accounts, 80 rows in this page. You can clearly see that there are only few of them which are verified, because verified is the only way to actually confirm that this page is actually legitimately the Police Organization page. And the other way that Police Organizations are doing is to connect the actual website which is Delhi Police dot gov dot in and probably link it to the actual Facebook or Twitter handle from that page. This just helps us to confirm that the legitimate Facebook page or Twitter handle.

You can see that there are only few of them are verified, Kolkata Police, Hyderabad City Police, Bangalore City Police, Bangalore City Traffic, both of them in Facebook and Twitter, and then Delhi Police and CP Delhi. We try keep this page updated if and when we get to know that if there is any page which we are missing.

Again if there's any page that you think we are missing please let us now in the forum, we will be actually happy. The idea here is for you to get a sense of how social media is being used in these context. So, keeping the topic of the course in mind in terms of the data collection analysis, let me show you how one can actually collect the data from these social networks and actually do some analysis which could be very useful for making some decisions.

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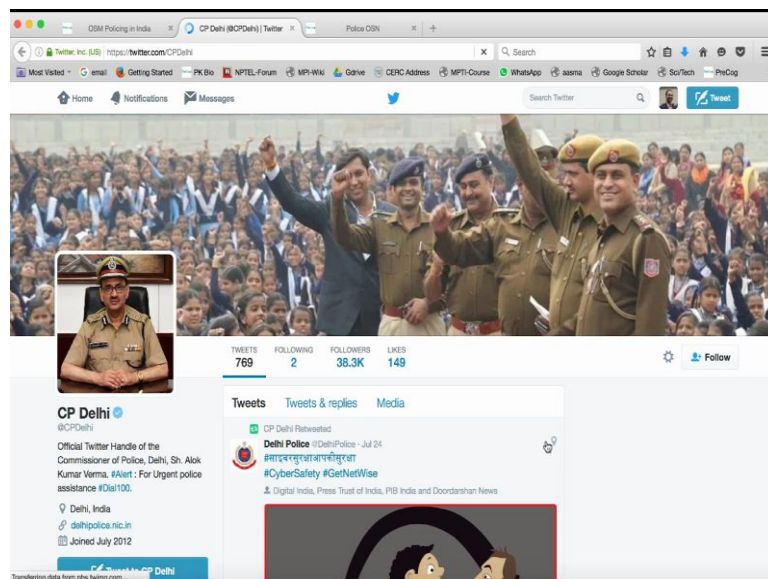


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Here is a page that we have set up for sometime which is basically a list of pages that are taken from the earlier page handles and then it is not only the link to those pages. So let me show you.

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Here what we have done is we just have linked to these pages, it just opens up the CP Delhi page for now from this link. Whereas, here what we did was we thought we should collect the data and do analysis on the data itself. There is going to capture some things that you have done in the tutorials which is taking data from these networks.

So now let me go to the Karnataka and let me go to Bangalore City Police to show you. Essentially the India map on top is capturing all the handles that we have in the database and from there if you click on a state it is going to take you to the state and show you all the pages that are there in that state, from there you can go down, go to a specific account. What I am doing here is, specifically looking at a Twitter handle of Bangalore City Police, so here is the city police Twitter handle and we have also captured the actual website which is dcp dot gov dot in which is useful for us.

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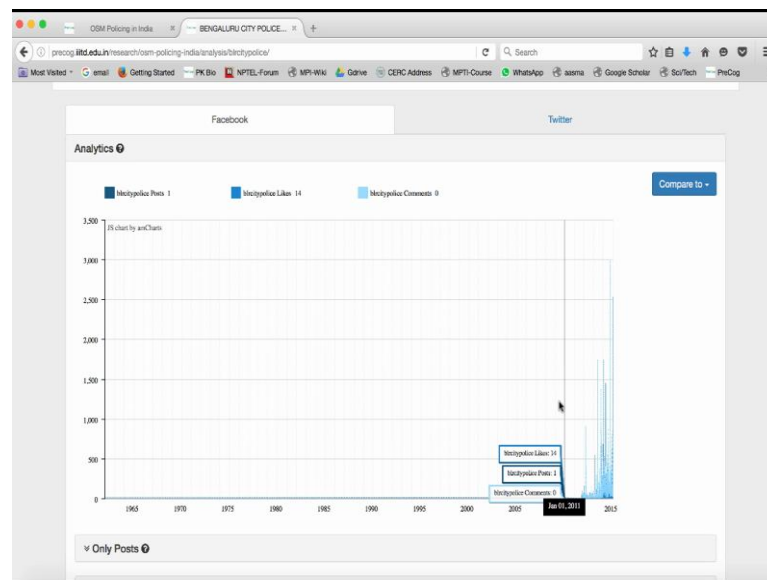


Now what we are looking at is the Facebook and you can go to Twitter also. In Facebook if you remember in the tutorial we talked about data collection and so now collecting the data from these accounts, putting them into the database from the json and doing the graph right. So we are going to slicker some other graphs that we can actually pretty use. Here if you see, you can actually zoom in to the data to see that how these handles have been posting.

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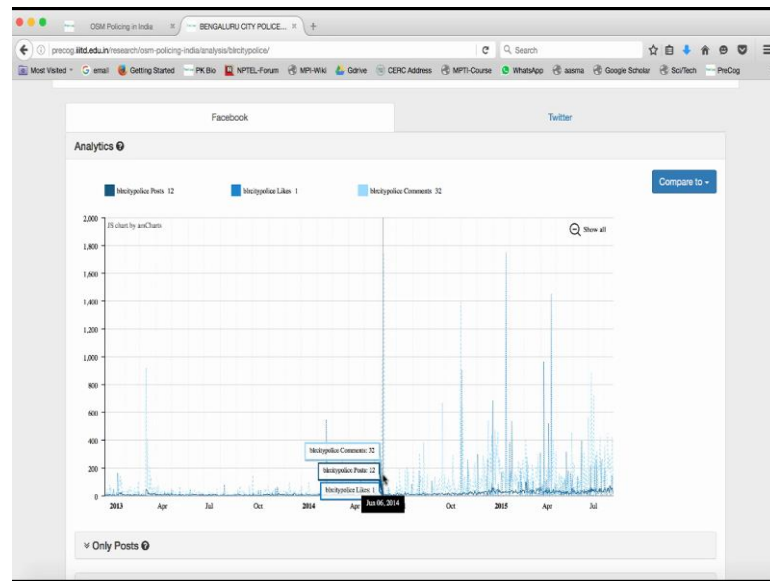


For example here, it says let us look at it here, Bangalore City Police, the likes that they got were 1 and then the post that they did was 12 and the comments that they got was 32. This kind of gives the sense of how active these handles are. You could do interesting analysis with these kinds of data from these social networks.

You have enough skills now in the course to collect such data and look at the data also. This week even the course questions that we are going to be looking at for the course is going to be based on something, some data that you can collect and some analysis that you can do. So that gives you a good sense.
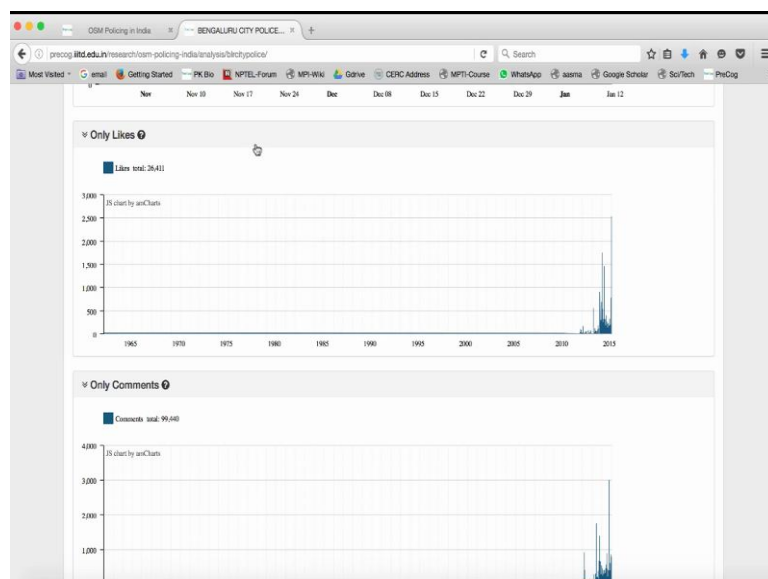
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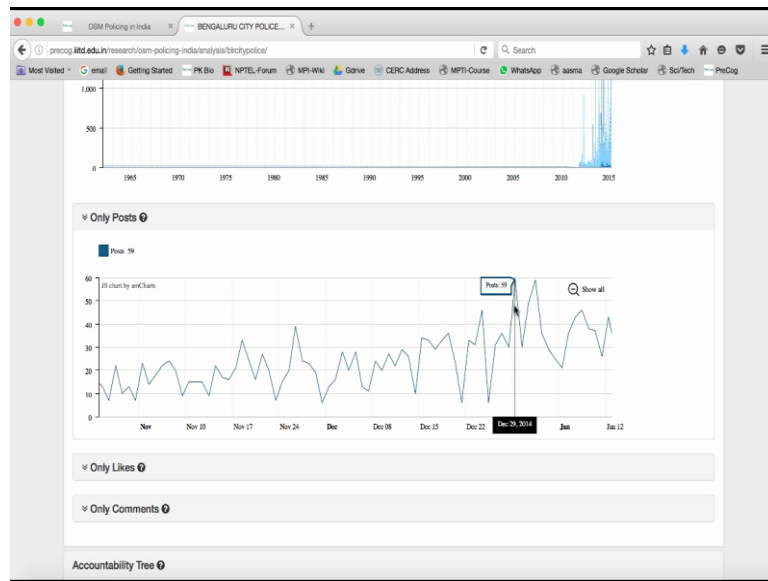


Then let us look at only the post analysis, which is the post that they have done but if they do, what time did they do, what post you can keep zooming into the data to look at, what kind of post, when did they do, what number of posts they do. For example, here it says in December 29-2014 they did 59 posts.

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Similarly, you could look at likes and comments also. This kind of gives you a good sense of how these Police Organizations are using the data, how this data can be collected, what analysis can be done, and I am sure you can do more analysis with this data also. I am going to be also specifically talking about one specific set of questions that we were trying to answer with the data that we collected from this social media services for the Police Organizations.