



## **A Criticism to Society (as seen by Twitter analytics)**

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# Big Data

Google+

2011

Pinterest

2010



Instagram

2009

foursquare

2008

tumblr.

2007

bado

reddit

<http://www.statisticbrain.com/twitter-statistics/>  
645 million active users  
58 million tweets per day  
2.1 billion queries per day  
125 countries  
33 languages

twitter

2006

NETLOG

slideshare  
Present Yourself

last.fm

2005

YouTube

2004

digg flickr

2003

LinkedIn

myspace

delicious

2002

friendster.

2001

WIKIPEDIA  
The Free Encyclopedia

## SOCIAL MEDIA TIMELINE



<http://www.statisticbrain.com/twitter-statistics/>

**645 million active users**

**58 million tweets per day**

**2.1 billion queries per day**

**125 countries**

**33 languages**



**Barack Obama** ✓

@BarackObama

This account is run by Organizing for Action staff. Tweets from the President are signed -bo.

📍 Washington, DC

🌐 [barackobama.com](http://barackobama.com)

🕒 Iscritto a marzo 2007

Twitta a Barack Obama

📷 1.250 foto e video



Prezi



TWEET  
12000

FOTO/VIDEO  
1.250

FOLLOWING  
650000

FOLLOWER  
43,8 Mln

PREFERITI  
5

Altro ▾

Tweet Tweet e risposte



**Barack Obama** @BarackObama · 14 h

Do your part to make change possible:  
[ofa.bo/hzR](http://ofa.bo/hzR)



↻ 1800

★ 2000



Visualizza altre foto e video



Barack Obama @BarackObama · 14 h



Do your part to make change possible:  
[ofa.bo/hzR](https://ofa.bo/hzR)



↻ 1800

★ 2000



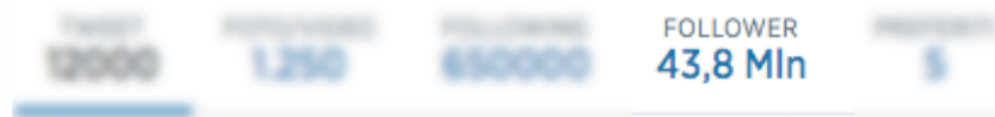
[Visualizza altre foto e video](#)

# Malicious accounts on Twitter

- spammers
- bots
- cyborgs
- fake followers

# Fake Follower definition

Fake followers are Twitter accounts created to inflate **the number of followers** of a target account, in order to increase its **popularity and influence**



**Mail**Online

**Barack Obama is political king of the fake Twitter followers, with more than 19.5 MILLION online fans who don't really exist**

**GIGAOM**

Bunch of phonies: study looks at politicians' fake Twitter followers

*The Sydney Morning Herald*  
**datapoint**

Fake followers boost politicians' Twitter popularity

**GIGWISE**

**HALF OF JUSTIN BIEBER'S 37M TWITTER FOLLOWERS REVEALED TO BE FAKE**

Can singer still claim to be the King of Twitter?



# Twitteraudit

The screenshot shows the Twitteraudit website. At the top, there is a search bar with the text "How many of your followers are real?" and a button labeled "Audit". Below this is a promotional banner for "TWITTERAUDIT PRO" with the text "Block fake followers, hide your audits, monthly audit reports and more!". A "Sign in with twitter" button is also visible. The "Recent Twitter audits" section lists two audits: one for @ferelguero with 75 Real and 8 Fake followers (90% audit score) and another for @eduardomahone with 12,606 Real and 257 Fake followers (98% audit score).

<https://www.twitteraudit.com/>

# "Fakers" app of StatusPeople

The screenshot shows the "Fakers" app interface for the user @s\_cresci. It displays three categories of followers: Fake (4%), Inactive (52%), and Good (44%). There is a "Share Your Scores on Twitter" button and a search bar for finding fake followers of friends. The search bar contains the text "Twitter username..." and a "Search" button. Below the search bar, it says "You have 0 friend searches left."

<http://fakers.statuspeople.com/Fakers/Scores>

# "Fake Follower Check" of Socialbakers

The screenshot shows the "fakefollowers" tool interface. It features a "BETA" badge and navigation links for "Home" and "Methodology". The main text reads: "Use our free tool as a guide to see if your followers are real, suspicious, or inactive. Simply type in any account name into the box below." Below this is a search bar containing "@checkmyaccount" and a "Check" button. At the bottom, there are three progress indicators: "0% suspicious or empty", "0% inactive", and "0% good". A checkbox for "Follow @socialbakers" is also present.

<http://www.socialbakers.com/twitter/fakefollowercheck/>



# Methodology

- get a **sample** of followers from the target account
- test the sample accounts to infer the **FF percentage**

# A bit of statistics

How to estimate the proportion of a population that holds a given property?

- unbiased sample
- independent choice of samples
- perfect test of the property

# Issues



Status  
of People

Fake Follower Check

socialbakers

fakefollowers

BETA

- **biased sample:** the sample is taken from a small subset of all the followers
- **time-dependent sample:** the sample is taken from the most recent followers
- **undisclosed analytic techniques:** no way to estimate how good the test is

# FFC

## Fake Follower Classifier

- **unbiased and independent sample:** the sample is taken from all the followers of the target account
  - 95% confidence level
  - 1% confidence interval
- **open source classifier:** exploits 23 distinct features
  - over 95% accuracy on the training-set

# Response Time analysis

<i>Twitter profile</i>	<i>followers</i>	<i>seconds</i>			
		<i>FFC</i>	<i>TA</i>	<i>SP</i>	<i>SB</i>
@giovanniallevi	13900	187	55	27	12
@StefanoBollani	22300	188	52	22	11
@Federugby	30300	193	40	31	13
@Zerolandia	33500	193	51	32	9
@pinucciotwit	35500	192	3	2	13
@mvbrambilla	36900	188	45	2	8
@PChiambretti	40500	198	45	23	9
@pierofassino	61500	203	52	3	10
@Lbarriales	69900	212	50	27	7
@PC_Chiambretti	70900	214	43	31	9
@herbertballeri	72300	217	54	24	10
@Flaviaventosole	75400	210	49	27	9
@RudyZerbi	79700	216	49	26	10

## Fake Followers analysis

Twitter profile	followers	Fake F. Classifier			Twitteraudit*		Statuspeople			Socialbakers		
		inact.	fake	good	fake	good	inact.	fake	good	inact.	fake	good
@RobDWaller	929	25	1.4	73.6	7	93	28	0	72	0	0	100
@dave	2971	13.5	4.1	82.4	14	86	26	3	71	0	4	96
@grossnasty	3344	12.9	4	83.1	4	96	26	3	71	0	2	98
@janrezab	10800	18.4	2.2	79.4	11	89	27	3	70	2	2	96
@giovanniallevi	13900	44.3	9.9	45.8	34	66	58	18	24	5	27	68
@StefanoBollani	22300	27.8	12.8	59.4	29	71	49	11	40	12	11	77
@Federugby	30300	46.5	15.5	38	42	58	51	33	16	9	33	58
@Zerolandia	33500	69.2	7.3	23.5	63	37	55	35	10	24	25	51
@pinucciotwit	35500	30	6.3	63.7	28	72	25	13	62	7	15	78
@mvbrambilla	36900	75.7	6.5	17.8	47	53	42	30	28	9	34	57
@PChiambretti	40500	31.6	21.7	46.7	36	64	56	22	22	13	19	68
@pierofassino	61500	77.9	4.6	17.5	46	54	39	39	22	14	31	55
@Lbarriales	69900	49.5	20.6	29.9	48	52	57	32	11	13	21	66
@PC_Chiambretti	70900	97	1.2	1.8	55	45	48	44	8	17	35	48
@herbertballeri	72300	46	10.4	43.6	48	52	56	22	22	14	20	66
@Flaviaventosole	75400	46.4	12.8	40.8	39	61	46	33	21	12	29	59
@RudyZerbi	79700	83.8	5.9	10.3	35	65	44	33	23	8	26	66
@David_Cameron	595K	24	11.7	64.3	19.5	80.5	17	48	35	10	14	76
@fhollande	608K	63.6	5.3	31.1	64.3	35.7	35	44	21	44	14	42
@BarackObama	41M	57.1	8.5	34.4	51.2	48.8	40	41	19	43	12	45

## Fake Followers analysis

Twitter profile	followers	Fake F. Classifier			Twitteraudit*		Statuspeople			Socialbakers		
		inact.	fake	good	fake	good	inact.	fake	good	inact.	fake	good
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@grossnasty	3344	12.9	4	83.1	4	96	26	3	71	0	2	98
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@Zerolandia	33500	69.2	7.3	23.5	63	37	55	35	10	24	25	51
@pinucciotwit	35500	30	6.3	63.7	28	72	25	13	62	7	15	78
@mvbrambilla	36900	75.7	6.5	17.8	47	53	42	30	28	9	34	57
<b>@PChiambretti</b>	<b>40500</b>	<b>31.6</b>	<b>21.7</b>	<b>46.7</b>	<b>36</b>	<b>64</b>	<b>56</b>	<b>22</b>	<b>22</b>	<b>13</b>	<b>19</b>	<b>68</b>
@pierofassino	61500	77.9	4.6	17.5	46	54	39	39	22	14	31	55
@Lbarriales	69900	49.5	20.6	29.9	48	52	57	32	11	13	21	66
<b>@PC_Chiambretti</b>	<b>70900</b>	<b>97</b>	<b>1.2</b>	<b>1.8</b>	<b>55</b>	<b>45</b>	<b>48</b>	<b>44</b>	<b>8</b>	<b>17</b>	<b>35</b>	<b>48</b>
@herbertballeri	72300	46	10.4	43.6	48	52	56	22	22	14	20	66
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@RudyZerbi	79700	83.8	5.9	10.3	35	65	44	33	23	8	26	66
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@fhollande	608K	63.6	5.3	31.1	64.3	35.7	35	44	21	44	14	42
@BarackObama	41M	57.1	8.5	34.4	51.2	48.8	40	41	19	43	12	45



# Conclusions



The logo for Status of People, consisting of the text "Status of People" in a blue box.

Fake Follower Check

The logo for socialbakers, consisting of the text "socialbakers" in a black box.

fakefollowers

BETA

- **biased, time-dependent, small sample** leads to **ambiguous results**
- **undisclosed methodologies** do not allow to **evaluate the correctness** of the results
- our **FFC tool** produces **more reliable results** at the price of higher response times



## Questions?

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