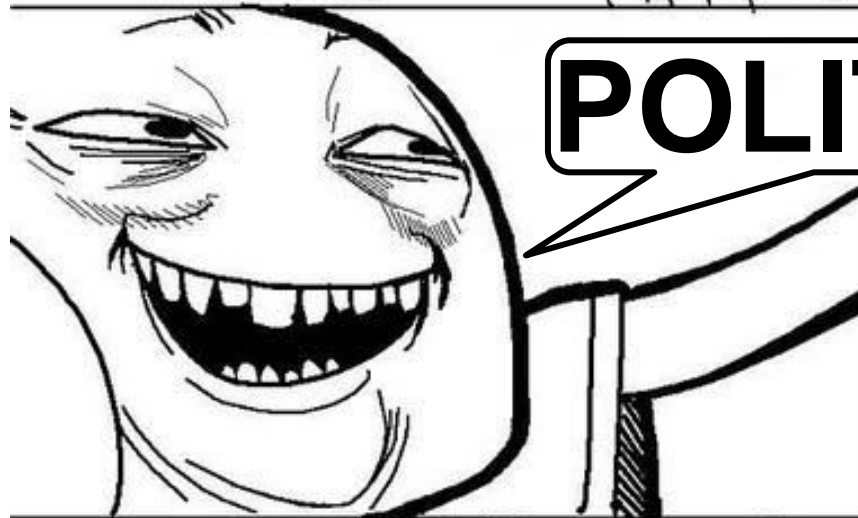
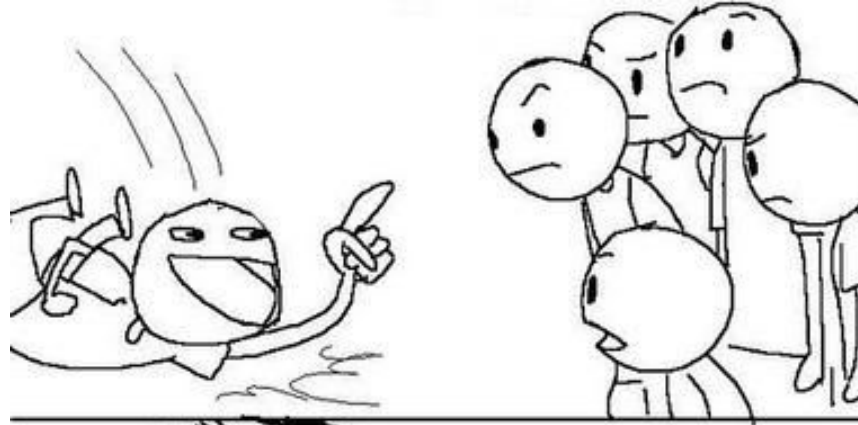


The Influence of Retweeting Robots During Brazilian Protests

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POLITICS!



Presidential Election Results - 2014



Discussion and Protests revolving the results

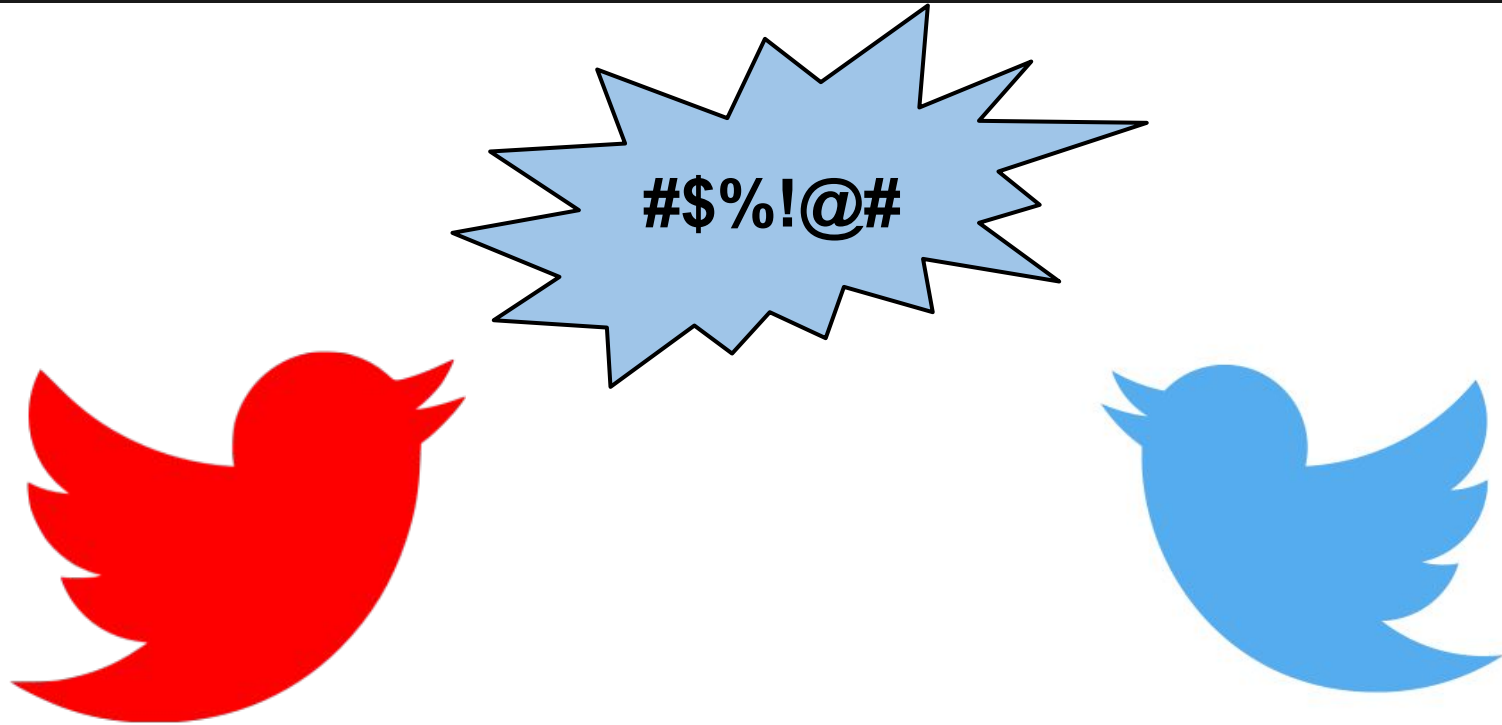


13 March
Pro-govern



15 March
Con-govern

The protests were also online...



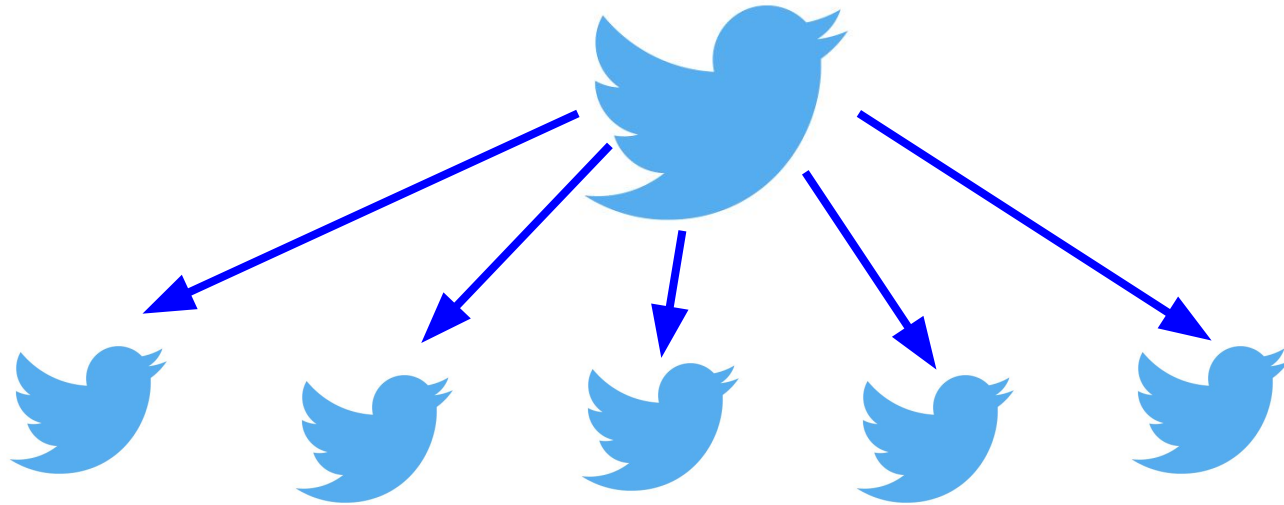
But how did the info spread?



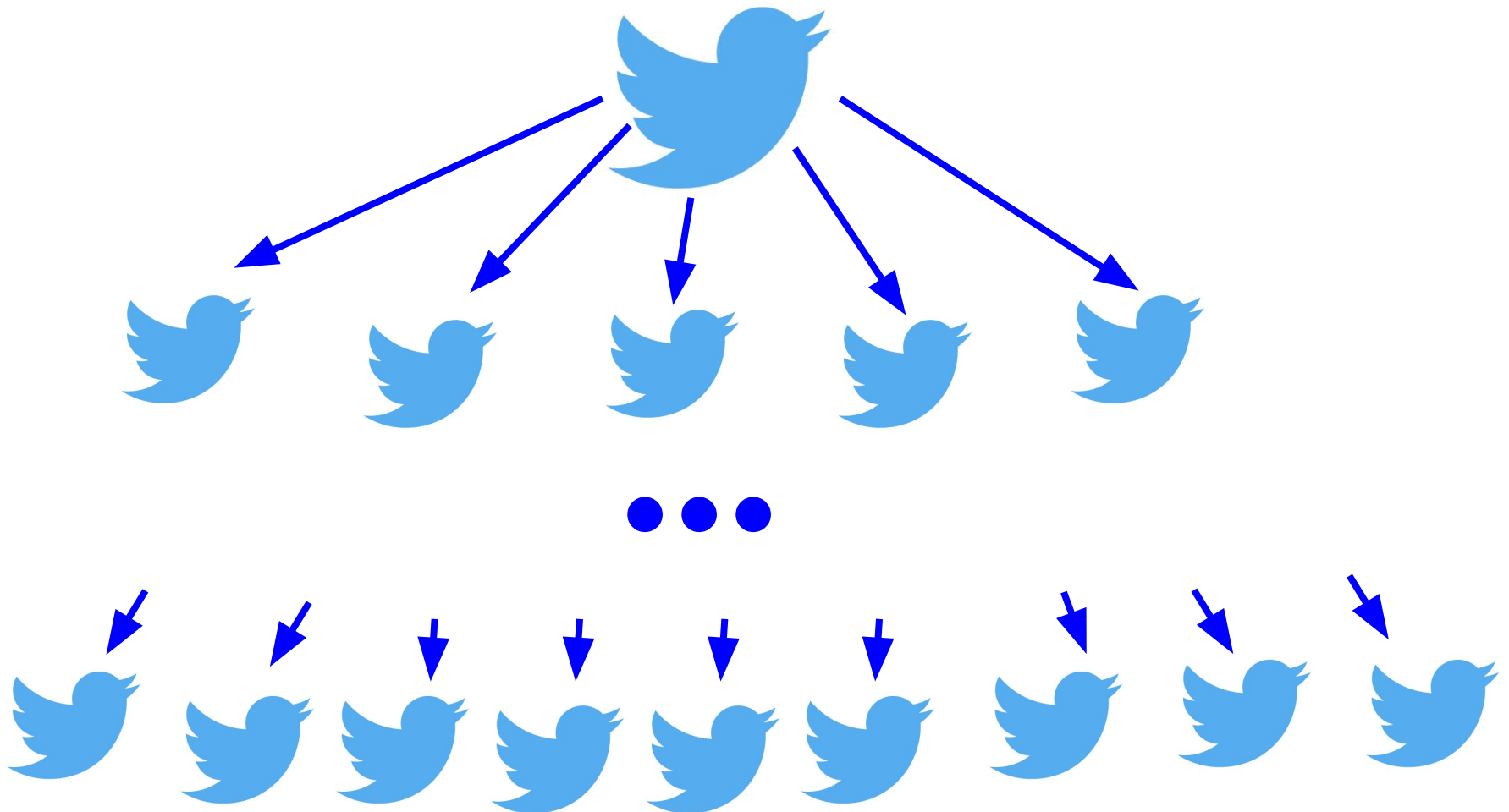
Retweeting Diffusion Network



Retweeting Diffusion Network



Retweeting Diffusion Network



Retweeting Diffusion Network

The number of children of a given node can be roughly predicted by:

$$Children = \frac{Followers}{Followers^{0.77} \cdot Followings^{0.12}}$$

Retweeting Diffusion Network

This retweeting rate can:

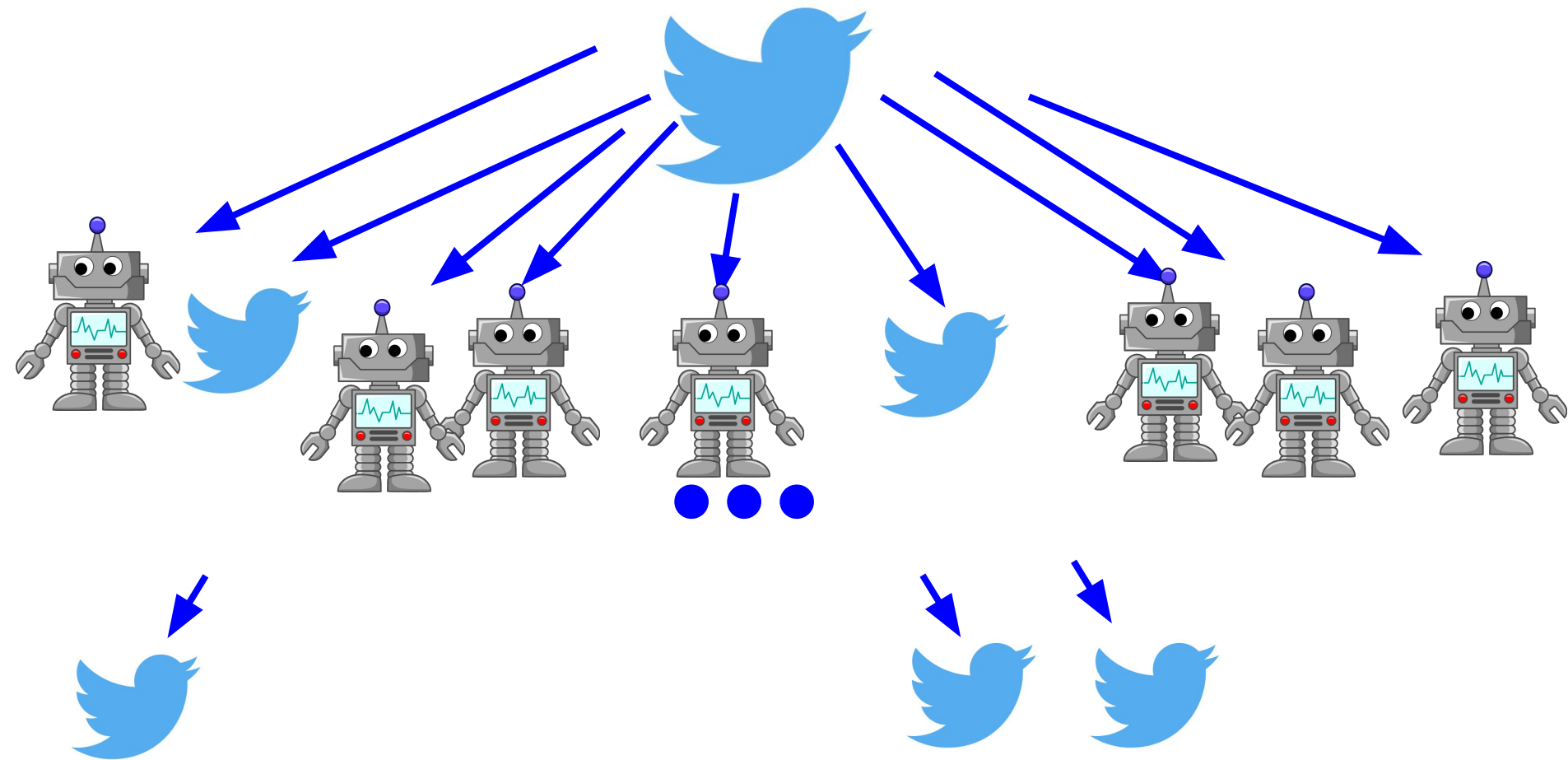
- Indicate a message impact
- Identify an influent user

Retweeting Diffusion Network

During the protests it helped us to:

- Estimate the most spread sentiment (pro or con)
- Find the influencers of these protests

But...



Use of Bots

Some twitters use bots to automatically share their messages.

They increase the number of retweets, inflating the impact of a message.

Their disruption is perceptible?

Methodology

1. Collect tweets during the day of protests:

**#13Marco, #PetrobrasEhBrasil13,
#SouPetrobras, #TodosContraOGolpe,
#br45ilnocorrupt, #globogolpista**

**#AcordaBrasil, #DilmaNaoMeRepresenta,
#DilmaVaiada, #ForaDilma, #ForaPT,
#ImpeachmentDilma, #VamosVaiaDilmaNaTV,
#VemPraRua15DeMarco**

#PronunciamentoDaDilma, #protestos

Methodology

2. Calculate:

- Goodness of fit for the impact prediction
- Network Statistics
- Eigenvector Centrality
- Power law

Methodology

3. Compare results from normal retweeting networks with those using bots

Tweet Collection

TABLE II. SUMMARY OF STUDIED DATASETS.

Dataset	# of Tweets	Unique words
PROGOV	84, 821	36, 070
CONGOV	189, 824	60, 684

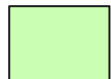
Most retweeted messages

TABLE II
LIST OF MOST RETWEETED TWEETS FROM 13TH MARCH, 2015.

User	Message (summary)	RTs	Class.
sigaruiz	"Those who didn't realize #GloboGolpista from the last two news, are being manipulated"	1,061	Pro (bot)
sigaruiz	"...Today, #Dia13DiaDeLuta is just the beggining."	550	Pro (bot)
sigaruiz	"it is not needed to be a genius...to notice that #GloboGolpista is not being impartial..."	533	Pro (bot)
Pragmatismo_	"Hashtag #GloboGolpista breaks a record of popularity and interaction"	318	Neutral
reginazukato	"50 thousand people on Paulista Avenue! #GloboGolpista"	316	Pro
HPozzuto	"Was in favor of dictatorship, ...conspire against democracy. Who is it? #GloboGolpista"	280	Pro
SOS_RIO	"Sunday, more than ever, boycott #GloboGolpista"	258	Pro
RodP13	"Images from the Brazilian protests..."	236	Pro
TerraNoticiasBR	"#VemPraRua: Caio Castro, Marcelo Serrado and others call out for the protest against Dilma"	221	Neutral
LuanaPiovaniTV	"...support to Dilma: 35 reais! Support to impeachment on sunday: priceless..."	208	Con



Militants pro-gov



News



bots



Militants against the gov

Most retweeted messages

TABLE III
LIST OF MOST RETWEETED TWEETS FROM 15TH MARCH, 2015.

User	Message (summary)	RTs	Class.
Yusnaby	"Brazil won't be a new Cuba...#ForaDilma"	1,481	Con
Yusnaby	"Brazil won't be a new Venezuela...#ForaDilma"	1,212	Con
RachelSherazade	"#15deMaro #VemPraRua #vempraPaulista"	728	Con
CauaReymondBR	"Do you know why their protests was on friday and ours is sunday? Because we work! #VemPraRua"	682	Con
LuanaPiovaniTV	"Hello Dilma! Learn how to make a pacific protest..."	661	Con
DaniloGentili	"See you in Paulista! Going there right now! #ForaPT #ForaDilma #ForaLula"	621	Con
Lanataenel13	"In Brazil, millions who reads the news ask for impeachment! No wait...it is everyone!"	618	Con
coisasdogaspa	"Bye Dilma! London is also on the streets! #VemPraRua"	612	Con
CauaReymondBR	"Look at the Northeast Brazil giving us pride! #VemPraRua #ForaDilma"	561	Con
dilmabr	"These people on the street yelling ForaDilma think that I'm just gonna step out?"	532	Pro



Militants pro-gov



News



bots



Militants against the gov

Goodness of Fit

Tweet	R²	MAE	MSR
<i>RDN1_13</i>	0.50	1.05	2.04
<i>RDN2_13</i>	0.40	0.00	0.00
<i>RDN3_13</i>	0.78	0.00	0.00
<i>RDN4_13</i>	0.85	0.03	0.15
<i>RDN5_13</i>	0.89	0.00	0.00
<i>RDN6_13</i>	0.89	0.03	0.08
<i>RDN7_13</i>	0.92	0.01	0.01
<i>RDN8_13</i>	0.89	0.00	0.00
<i>RDN9_13</i>	0.92	0.00	0.00

Tweet	R²	MAE	MSR
<i>RDN1_15</i>	0.86	0.00	0.00
<i>RDN2_15</i>	0.84	0.00	0.00
<i>RDN3_15</i>	0.88	0.00	0.00
<i>RDN4_15</i>	0.89	0.00	0.00
<i>RDN5_15</i>	0.89	0.00	0.00
<i>RDN6_15</i>	0.90	0.00	0.00
<i>RDN7_15</i>	0.85	0.00	0.00
<i>RDN8_15</i>	0.92	0.00	0.00
<i>RDN9_15</i>	0.89	0.00	0.00

Average Degree

Tweet	avg. degree
RDN1_13	1.83
RDN2_13	0.32
RDN3_13	0.01
RDN4_13	35.01
RDN5_13	11.04
RDN6_13	19.29
RDN7_13	30.09
RDN8_13	29.33
RDN9_13	11.05

Tweet	avg. degree
RDN1_15	23.32
RDN2_15	17.42
RDN3_15	7.00
RDN4_15	3.40
RDN5_15	13.60
RDN6_15	2.56
RDN7_15	7.44
RDN8_15	4.15
RDN9_15	10.31

Eigenvector

Tweet	eig.	depth
RDN1_13	0.06	6
RDN2_13	0.06	5
RDN3_13	0.06	2
RDN4_13	0.20	5
RDN5_13	0.33	6
RDN6_13	0.18	6
RDN7_13	0.20	6
RDN8_13	0.24	4
RDN9_13	0.36	7

Tweet	eig.	depth
RDN1_15	0.14	7
RDN2_15	0.15	9
RDN3_15	0.59	9
RDN4_15	0.68	10
RDN5_15	0.43	12
RDN6_15	0.70	6
RDN7_15	0.28	7
RDN8_15	0.62	16
RDN9_15	0.20	12

Final Remarks

- The use of bots affect different network metrics
- The main differences are on goodness of fit of prediction, average degree and eigenvector centrality
- The pro govern protests made use of bots, inflating their impact

Questions

The data sets and source code are available at:

github.com/folivetti/POLITICS

