Scientific and amateur analysis of Facebook Algorithm

https://facebook.tracking.exposed

Claudio Agosti, HOPE

@_vecna

Slide at https://github.com/tracking-exposed/presentation/blob/master/HOPE-2018.pdf

In the information age
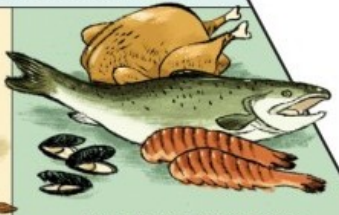You are what you know
(or what you are **exposed** to?)

It is a bit like saying
Check your diet, because
you are what you eat

DAIRY (1–2 servings a day) OR
VITAMIN D/CALCIUM SUPPLEMENTS
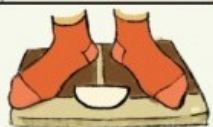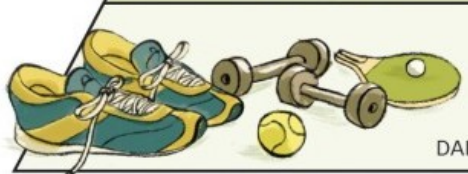
NUTS, SEEDS, BEANS & TOFU

FISH, POULTRY & EGGS

VEGETABLES & FRUITS

HEALTHY FATS/OILS

WHOLE GRAINS

DAILY EXERCISE & WEIGHT CONTROL

LOW FAT MILK

What if social media feeds with you with ONLY CANDY?

DAIRY (1-2 servings a day) OR VITAMIN D/CALCIUM SUPPLEMENTS

NUTS, SEEDS, BEANS & TOFU

FISH, POULTRY & EGGS

VEGETABLES & FRUITS

HEALTHY FATS/OILS

WHOLE GRAINS

DAILY EXERCISE & WEIGHT CONTROL

We address Facebook because is the biggest actor in the field

But you should apply the same thought to any platform which uses the algorithm to personalize experiences

Experimental evidence of massive-scale emotional contagion through social networks

Adam D. I. Kramer, Jamie E. Guillory, and Jeffrey T. Hancock

This article has corrections. Please see:

Editorial Expression of Concern: Experimental evidence of massivescale emotional contagion through social networks

What Happens to #Ferguson Affects Ferguson:

Net Neutrality, Algorithmic Filtering and Ferguson

FB algorithm is a conflict space

Caryn Vainio
@Hellchick

Follow

For those of you who work in social media, I need to share the story of my friend who died, and I didn't know because algorithms.

1:05 PM - 18 Dec 2017

12,522 Retweets 16,532 Likes

431   13K   17K

Caryn Vainio @Hellchick · 18 Dec 2017

A friend I've known mostly online for 15+ years died this weekend. Our friendship started on an old gaming forum, but continued on Facebook.

9   173   1.6K

Pesquisar

Claudio   Página inicial   Encontrar amigos   1

Claudio Almir

📰 **Feed de Notícias** ⋯
💬 Messenger
🏪 Marketplace

Atalhos
Artificial Intelligenc... 20+
Tecnologia da Infor... 20+

Explorar
🚩 Páginas
👥 Grupos
📅 Eventos
👥 Listas de amigos
🕐 Lembranças
📑 Feed de Páginas 20+
👥 Encontrar amigos
🎮 Jogos
🖼 Fotos
LIVE Vídeo ao vivo
˅ Ver mais...

Criar
Anúncio · Página · Grupo ·
Evento · Campanha de
arrecadação de fundos

✏ Criar publicação | 🖼 Álbum de fotos/vídeos | 📹 Vídeo ao vivo

No que você está pensando, Claudio?

🖼 Foto/vídeo   😀 Sentimento/atividade   ⋯

⊘ This post will be kept private   ⚡ Your data

Stories   ⋯

➕ **Adicionar ao seu story**
Compartilhe uma foto, vídeo ou
escreva algo

Grupos sugeridos   ver tudo
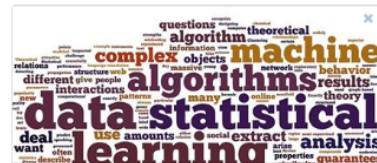
Deep Learning & A.I
2.325 membros   ➕ Participar

eat();   sleep();   code();   repeat();
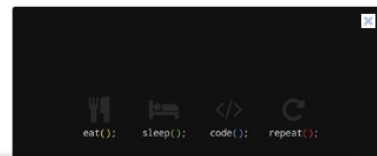
Yay!! Welcome to facebook.tracking.exposed!

To let FbTREX work, you should opt-in in the forms of data-reuse you want us to enable. A more extensive explanation can be found at the page **privacy statement**.

Give us the right to process a copy of your Facebook timeline (public data only).

The data you provide, could be reused, anonymized and not linked to any of your activity, to collectively understand the society connected to Facebook and how the algorithm has influence. All the tests are **documented and transparent**.

Join the collective analysis of social network phenomena, please note: people are protected. you, and anyone else

Close and Continue→

(You should opt-in at least at the first button to get rid of this box)

	public figures, media, high visibility pages	others (individual)
Public posts	Collected & shared	Collected
Friends-only posts	Not collected	Not collected
Custom audience	Not collected	Not collected

Evidence are posts + advertising

Then what? How do you measure the algorithm?
not like this
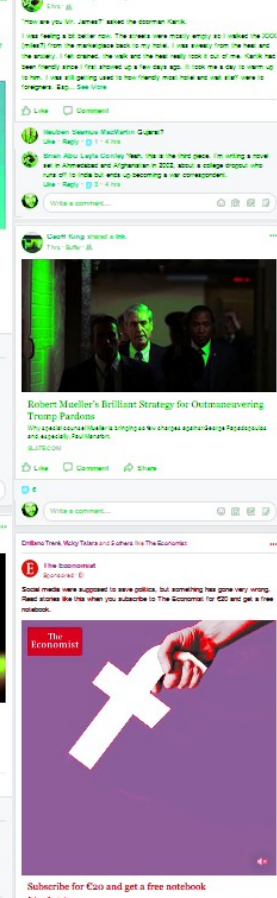
The timelines are the product of four variables

- The user's profiles
- The *NewsFeed* algorithm
- What the users follow, (a.k.a. friends)
- How many posts they get (duration, frequency)

Our is black-box test, we should reduce these variables

How to start?

Italian general election, 2018

← 2013   **4 March 2018**   Next →

All 630 seats in the Chamber of Deputies
and 315 (out of 321) seats in the Senate of the Republic

Opinion polls

Turnout	72.93%[1]		

Leader	Matteo Salvini[3]	Luigi Di Maio	Matteo Renzi
Alliance	Centre-right coalition	Five Star Movement	Centre-left coalition
Leader since	15 December 2013	23 September 2017	7 May 2017[a]
Leader's seat	Calabria (S)[b]	Acerra (C)[5]	Florence (S)[2]
Seats won	265 C / 137 S	227 C / 112 S	122 C / 60 S
Seat change	▲ 138 C / ▲ 20 S	▲ 114 C / ▲ 58 S	▼ 227 C / ▼ 65 S
Popular vote	12,152,345 (C)	10,732,066 (C)	7,506,723 (C)
	11,327,549 (S)	9,733,928 (S)	6,947,199 (S)
Percentage	37.0% (C)	32.7% (C)	22.9% (C)
	37.5% (S)	32.2% (S)	23.0% (S)

We defined a scope, and pick 30 pages/political figures

Methodology

Antonietta	Britta	Michele	Oliviero	Andrea	Santiago
Follow the 30 pages	Follow the 30 pages	Follow the 30 pages	Follow the 30 pages	Follow the 30 pages	Follow the 30 pages

We made six users

Methodology

Antonietta	Britta	Michele	Oliviero	Andrea	Santiago
Follow the 30 pages	Follow the 30 pages	Follow the 30 pages	Follow the 30 pages	Follow the 30 pages	Follow the 30 pages
left	*Movement 5 Stars*	*far-right*		*Right*	*Center-Left*

made the profiles diverge,
they *like*d different content and affiliated pages.
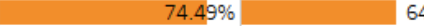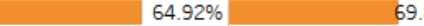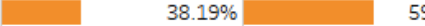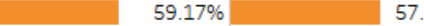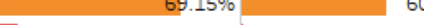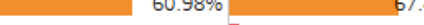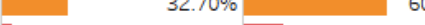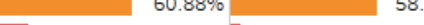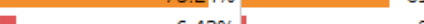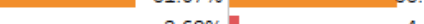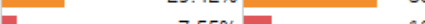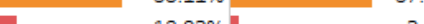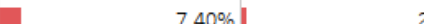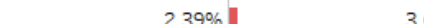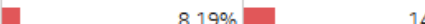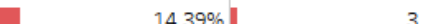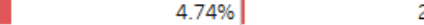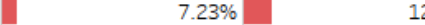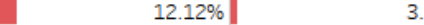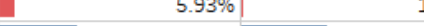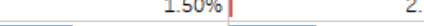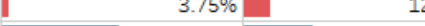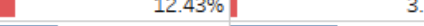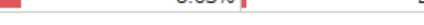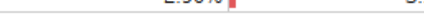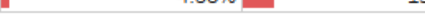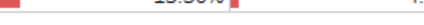
Methodology

			Profile Name / Profile Align					
			Andrea	Antonietta	Britta	Michele	Oliviero	Santiago
Month	Day	Hour	right	left	M5S	far-right	undecided	center-left
January	25	7	39	41	42	43	42	39
		8	44	42	40	39	46	47
		9	44	39	40	46	46	56
		10	52	48	46	40	47	47
		11	52	27	52	51	41	44
		12	52	43	49	46	41	56
		13	42	43	50	49	44	44
		14	44	46	50	49	43	49
		15	47	50	53	46	41	48
		16	42	45	51	45	47	45
		17	47	39	46	46	43	47
		18	50	43	47	52	46	51
		19	44	44	46	50	38	45

They were accessing at the same time, *auto-scrolling*

Now we can run comparisons!

			Profile Name / Profile Align					
			Andrea	Antonietta	Britta	Michele	Oliviero	Santiago
Month of $..	Day of $dat..	Utype	right	left	M5S	far-right	undecided	center-left
February	8	photo	21.62%	33.45%	25.85%	53.80%	30.18%	39.10%
		post	74.49%	64.92%	69.88%	38.19%	59.17%	57.90%
		video	3.89%	1.63%	4.28%	8.01%	10.65%	3.00%
	9	photo	23.22%	38.29%	27.76%	62.03%	21.76%	36.70%
		post	69.15%	60.98%	67.41%	32.70%	60.88%	58.61%
		video	7.63%	0.73%	4.83%	5.27%	17.37%	4.70%
	10	photo	18.34%	36.25%	28.79%	63.02%	29.06%	38.81%
		post	75.24%	61.07%	66.72%	29.42%	58.11%	57.52%
		video	6.43%	2.68%	4.48%	7.55%	12.83%	3.67%
	11	photo	18.99%	34.87%	27.12%	58.47%	29.16%	33.93%
		post	73.60%	62.74%	69.26%	33.33%	56.45%	62.84%
		video	7.40%	2.39%	3.63%	8.19%	14.39%	3.23%
	12	photo	17.22%	38.62%	34.36%	61.91%	29.66%	36.25%
		post	78.04%	59.20%	63.09%	30.86%	58.23%	60.25%
		video	4.74%	2.19%	2.55%	7.23%	12.12%	3.50%
	13	photo	22.62%	42.06%	34.00%	63.24%	31.65%	44.76%
		post	71.45%	56.45%	63.80%	33.00%	55.92%	52.22%
		video	5.93%	1.50%	2.19%	3.75%	12.43%	3.02%
	14	photo	29.07%	38.49%	36.28%	53.78%	28.65%	44.72%
		post	62.30%	58.61%	60.53%	41.63%	58.00%	51.16%
		video	8.63%	2.90%	3.19%	4.58%	13.36%	4.11%

Size proportional to the amount of evidence collected

filter bubble is not a simple concept

		Profile Name / Profile Align										
		Andrea		Antonietta		Britta		Michele		Oliviero		Santiago
Day of $dat..	Publisher O..	right		left		M5S		far-right		undecided		center-left
8	center-left		56		52		79		23		55	58
	far-right		26		34		20		19		23	23
	left		18		45		20		10		12	15
	M5S		68		52		89		13		60	48
	right		300		91		156		40		71	61
9	center-left		76		55		78		22		58	61
	far-right		30		28		26		19		19	23
	left		28		35		27		9		15	17
	M5S		82		58		103		15		68	48
	right		213		60		111		32		78	43
10	center-left		64		42		64		17		47	48
	far-right		25		25		33		26		23	26
	left		24		28		21		13		14	18
	M5S		85		34		91		14		50	32
	right		240		55		117		27		54	46
11	center-left		79		49		75		15		41	44

Size proportional the amount of unique posts

How many posts have already been seen?

Profile Name / Profile Align

Observed	Andrea right	Antonietta left	Britta M5S	Michele far-right	Oliviero undecided	Santiago center-left
1	2,922	1,395	2,171	420	1,177	1,092
2	1,080	1,129	1,192	425	1,101	1,090
3	317	755	414	431	789	997
4	97	321	130	435	404	519
5	43	136	43	442	164	216
6	18	64	9	426	58	78
7	10	21	3	328	24	31
8	5	9		219	13	15
9	3	6		128	8	8
10	2	3		78	7	3
11	1	2		54	6	3
12	1	2		40	2	3
13	1	2		33	1	3
14		2		30	1	1
15		2		20	1	1
16		1		6		
17				2		
18				2		
19				1		
20				1		

Investigate on specific event

Italy

Attacks on immigrants highlight rise of fascist groups in Italy

Antifascists say authorities have no will to stop 'unconstitutional' far-right parties

Lorenzo Tondo *in Palermo*

🐦 @lorenzo_tondo
Tue 6 Feb 2018 14.06 GMT

f 🐦 ✉ •••

< 21,253

Michele

Santiago

Antonietta

Voltaire
Governo Renzi   Amnistia
Otto e mezzo   Individuo
Ferrovia Torino-Milano
Presidente del Senato   Salerno
Aristotele
Senato della Repubblica   Bologna
Bergamo
Ira   Indulto
Senso comune   Servizio militare
Partito Popolare Europeo
Libro Arnoldo Mondadori Editore   Chiesa   Nigeria
Governo Craxi   Corte   Ebrei Casa
Tricolore
Diritto penale   Medico   RIS
Governo Gentiloni   Bella ciao
Basso   Cantante   Cinquestelle
Anni settanta   Farmacia
Il Canto degli Italiani   Cosmopolita
Los Angeles   I nostri ragazzi   Einaudi
Mica   Sit-in   Pollenza
Querela   Criminalità organizzata
Libia   Immigrazione   Grilletto   Iside   Pulsano
Attentato   Antonio Tajani
Berlino   Barcellona
Proiettile   Jean-Jacques Rousseau   Martirio   Cinismo
Egoismo   Svastica   Apartheid
Facebook   Europa   Opposizione   Chi sbaglia paga
Fondamentalismo islamico
Razzismo   Corradino Mineo
Ghana   Matteo Renzi   Socialista
Polizia   Bolzano   Élite
Voce   Sinistra   Vangelo   PIL
Macerata   Fascismo   Siamo circondati
Nizza
Scienza
Italia   Racconto
Suolo   Matteo Salvini   Politica   Lega Nord
Antifascista
Sindaco
Partito Democratico
Movimento 5 Stelle
Silvio Berlusconi
Democrazia

WORLD WIDE WEB
FOUNDATION

THE INVISIBLE CURATION OF CONTENT:

Facebook's News Feed and our
Information Diets

April 2018

Facebook API

FbTREX

Hidden from all 6 profiles
9,532 posts

Seen by Andrea (M) & Lucía (K)
640 posts

Seen by Andrea (M) but not by Lucía (K)
552 posts

Seen by others but not by Andrea (M) or Lucía (K)
450 posts

Seen by Lucía (K) but not by Andrea (M)
429 posts

The public square as seen by Facebook

The public square as seen by each of our users
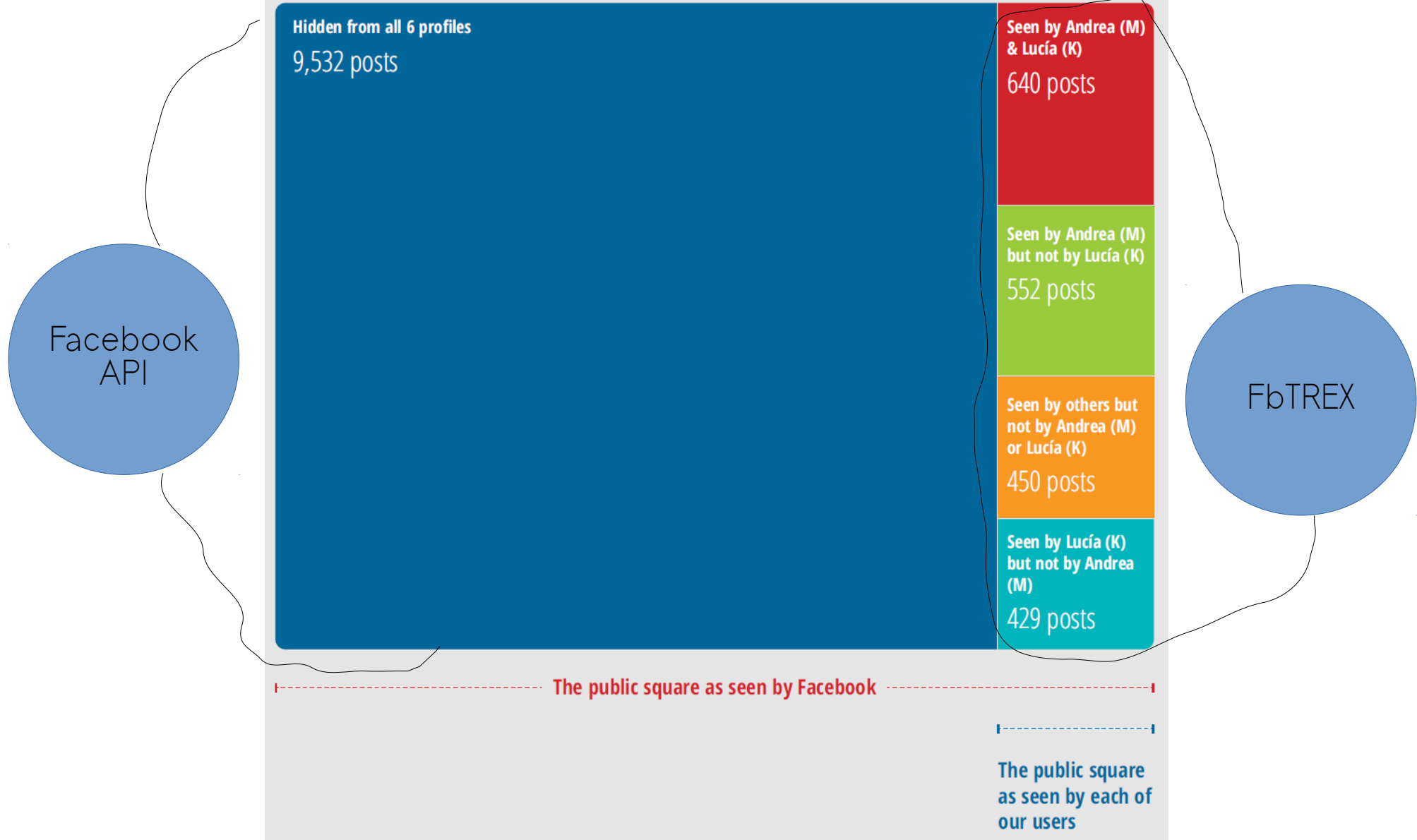
What about fair competition?

European Commission - Press release

Antitrust: Commission fines Google €2.42 billion for abusing dominance as search engine by giving illegal advantage to own comparison shopping service

Brussels, 27 June 2017

Using the API, we compared media productivity

Published posts by three selected media
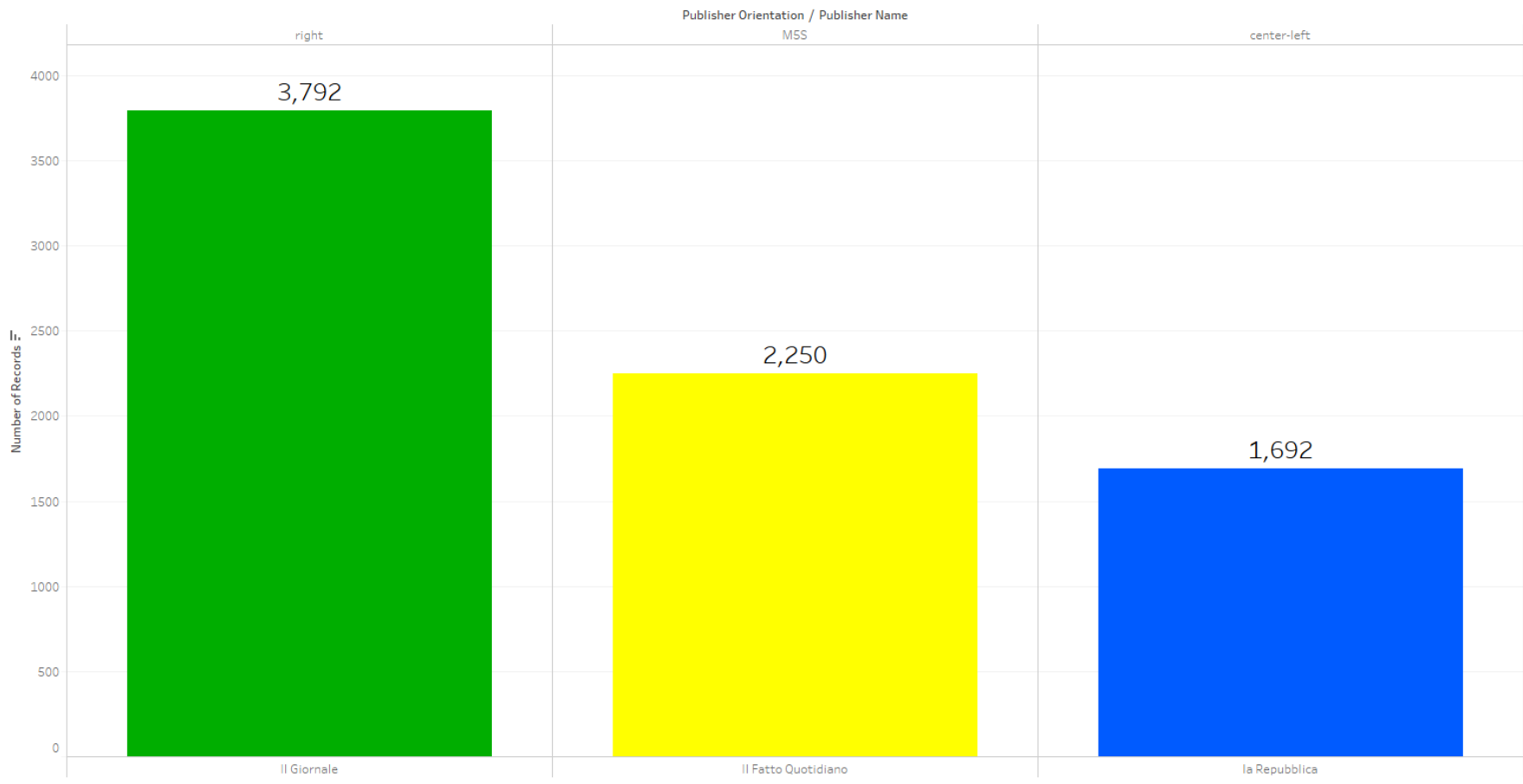
How they have been treated on surfaced posts?

Surfaced posts by three selected media

Profile Align / Profile Name

Time to wrap up =)
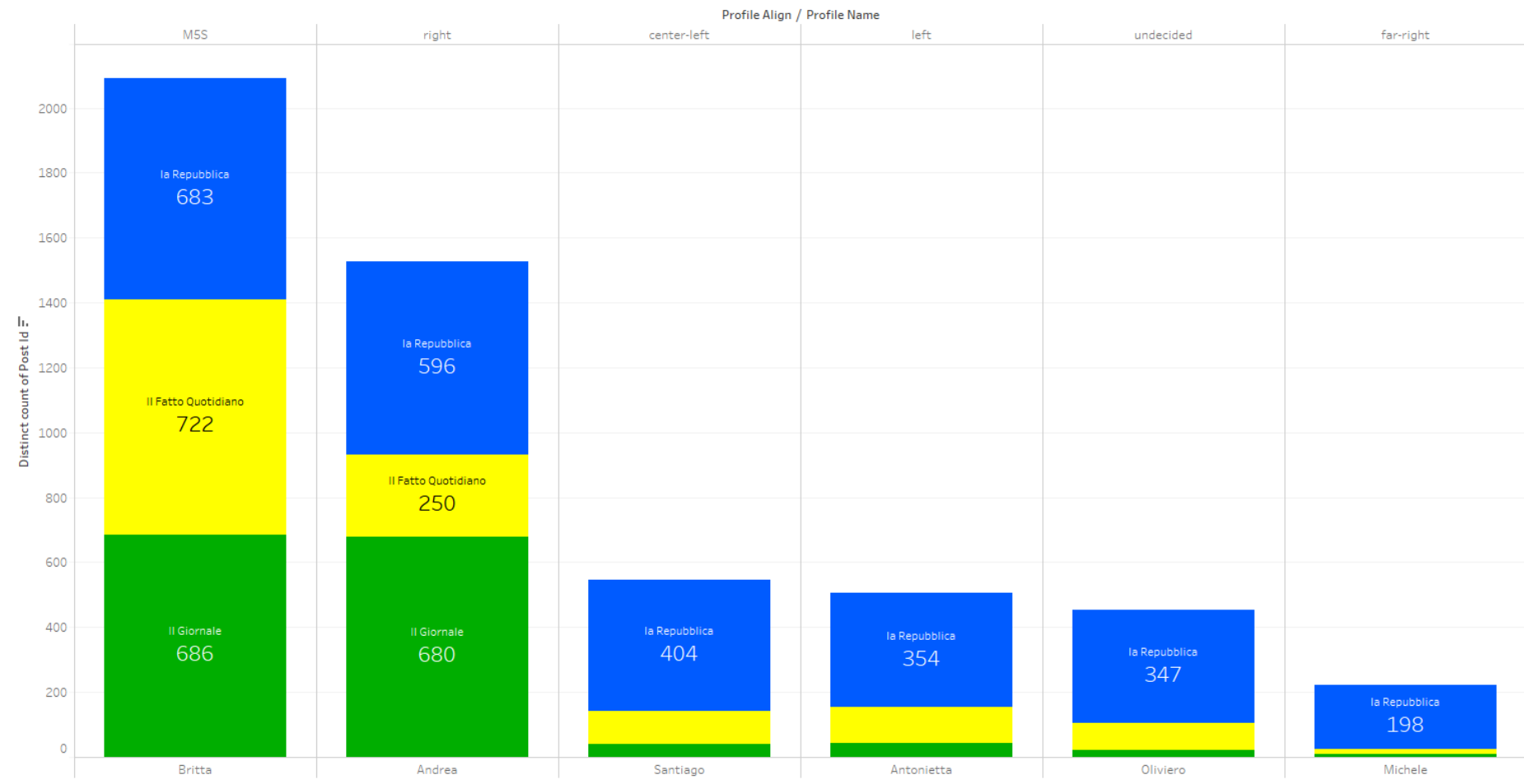
https://tracking.exposed goal is to foster *algorithm diversity*

If algorithms decide your priorities, you **deserve to run** your own algorithm.

- Address misinformation [1,2]
- Use different metrics than SM
- Outrage on algorithms discrimination
- Implement priorities of people/cultures *distant* from Palo Alto

done. If the imaginary change, we won.

Join us?

data analysts - UX - backend developer - advocate - journalist - fundraiser - privacy/security analyst

Check the repositories
https://github.com/tracking-exposed

Fell something in common with this manifesto
https://tracking.exposed

References

When the NewsFeed changed (or at least, the only time has been announced) in January 2018
https://eu.usatoday.com/story/tech/2018/01/11/facebook-newsfeed-big-change/1023331001/

Facebook Manipulated User News Feeds To Create Emotional Responses
https://www.forbes.com/sites/gregorymcneal/2014/06/28/facebook-manipulated-user-news-feeds-to-create-emotional-contagion/#66a1275739dc

Report by Fabio Chiusi and Claudio Agosti on Italian political campaign
https://ourdataourselves.tacticaltech.org/posts/overview-italy/

```
@unpublished{FacebookFairness,
author = {Hargreaves, Eduardo and Agosti, Claudio and Menasch{\'{e}}, Daniel and Neglia, Giovanni and Reiffers-masson, Alexandre and Altman, Eitan},
booktitle = {to appear in the 36th International Symposium on Computer Performance, Modeling, Measurements and Evaluation 2018},
title = {{Fairness in Online Social Network Timelines : Measurements , Models and Mechanism Design}}
}
```

Our data http://github.com/tracking-exposed/experiments-data/

Previous slides https://github.com/tracking-exposed/presentation/

https://www.opendemocracy.net/digitaliberties/claudio-agosti/could-populism-be-side-effect-of-personalized-algorithm

On Repetition https://medium.com/@trackingexposed/the-iron-bubble-or-how-the-facebook-algorithm-insulates-fascists-from-reality-d36739b0758b

WebFoundation report https://webfoundation.org/research/the-invisible-curation-of-content-facebooks-news-feed-and-our-information-diets/