

Trenja stališč in čustvenčki v žarišču

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Odsek za tehnologije znanja

Institut „Jožef Stefan“



@ JOTA, FRI, Univerza v Ljubljani, 21. maj, 2018

Kaj je to?

U+1F602



U+1F468 U+200D U+1F469 U+200D U+1F466 U+200D U+1F466



Smeško, čustvenček, emotikon, emoji

Angleško	Primeri	Slovensko
smiley	:-) 	smeško
emotikon	:-(>:-[<3 @}-;-'---- ><(((^>	
kaomoji	ΣЖЗ ((d[-_-]b)) (°5°) [^._.^]/≡	čustvenček
emoji	          	

Unicode® Emoji

Version	Emoji count	Year
1.0.0	76 (+76)	1991
3	78 (+2)	1999
3.2	86 (+8)	2002
4	94 (+8)	2003
4.1	108 (+14)	2005
5.1	112 (+4)	2008
5.2	139 (+27)	2009
6	855 (+716)	2010
6.1	868 (+13)	2012
7	972 (+104)	2014
8	1,013 (+41)	2015
9	1,085 (+72)	2016
10	1,144(+56)	2017
11	1,210(+66)	2018 (draft)



Emoji se kot kategorija pojavi v Unicode 6.0 in prekvalificira nekatere znake, ki so obstajali že prej.

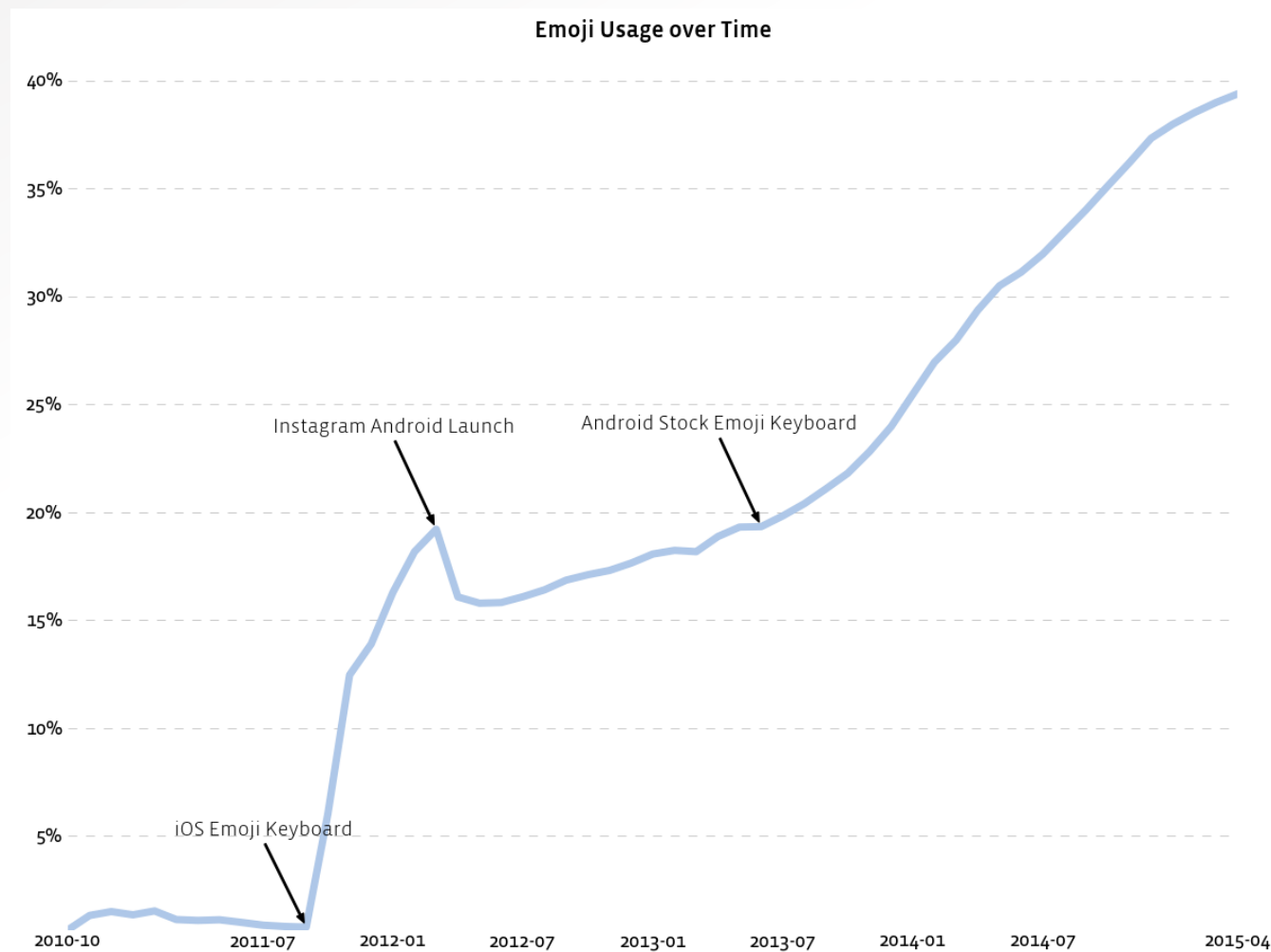
Unicode® Emoji

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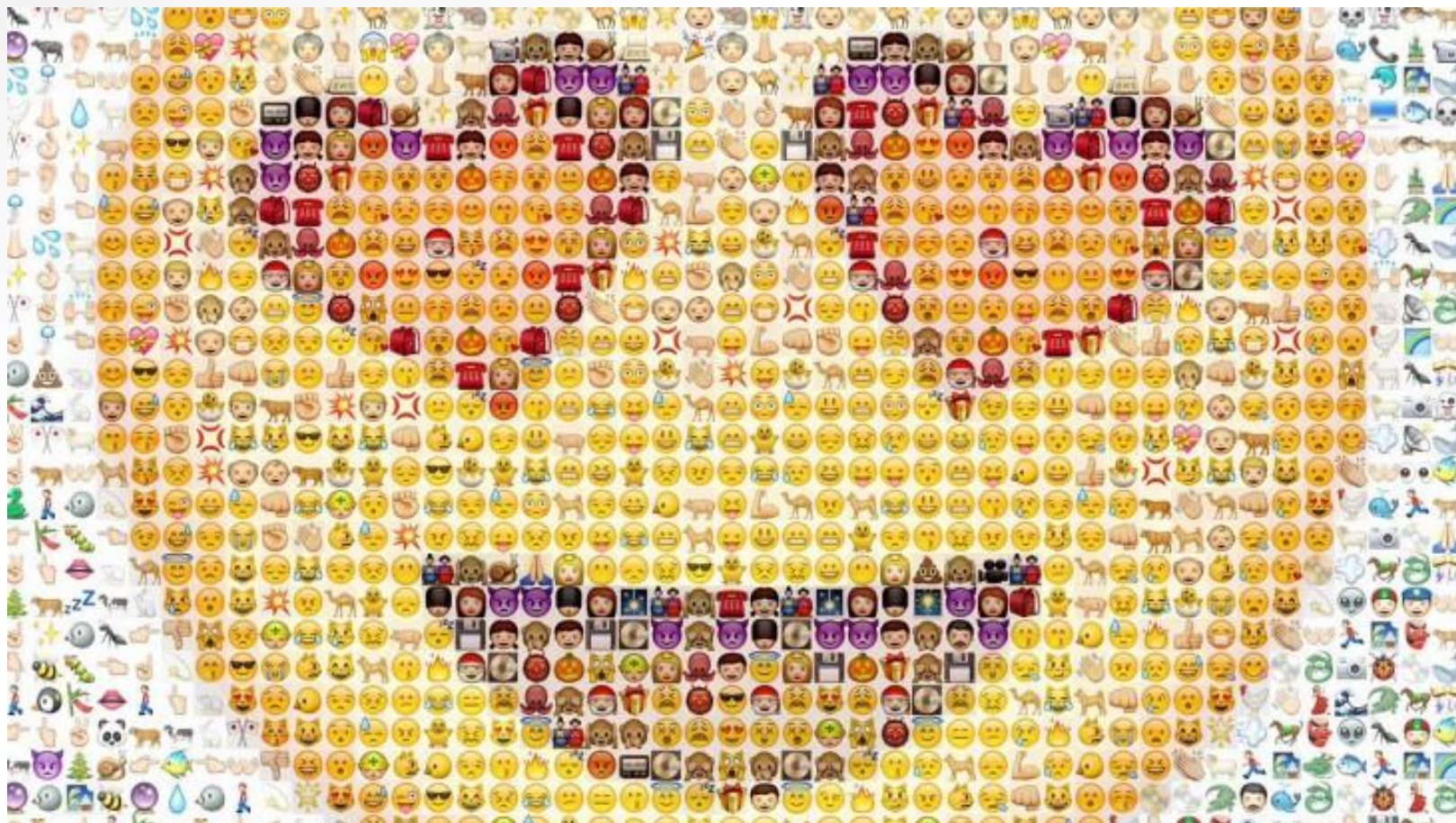


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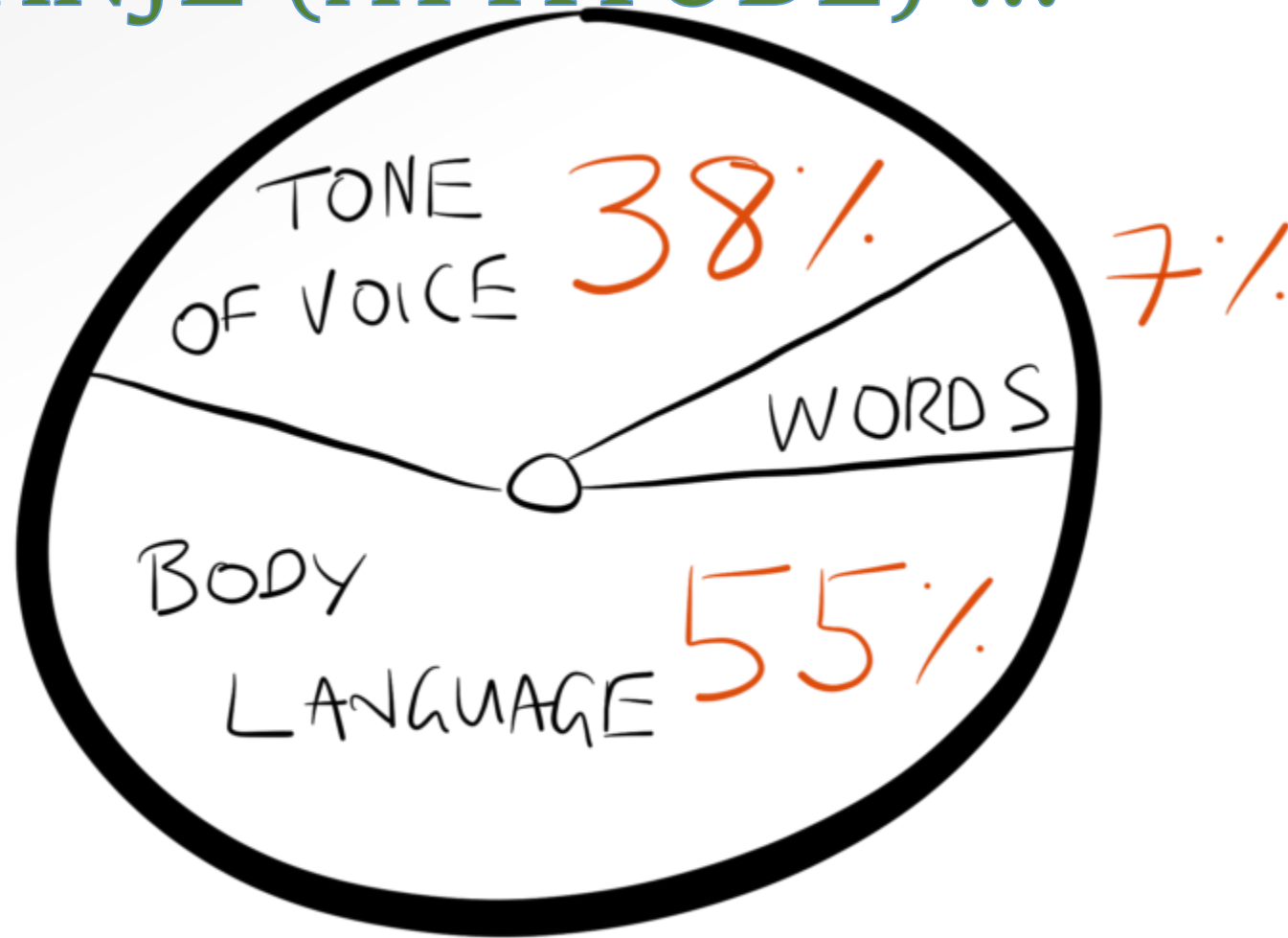
Popularnost emojijev: Instagram



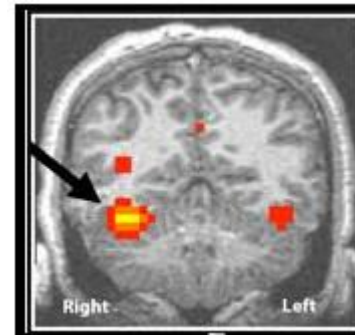
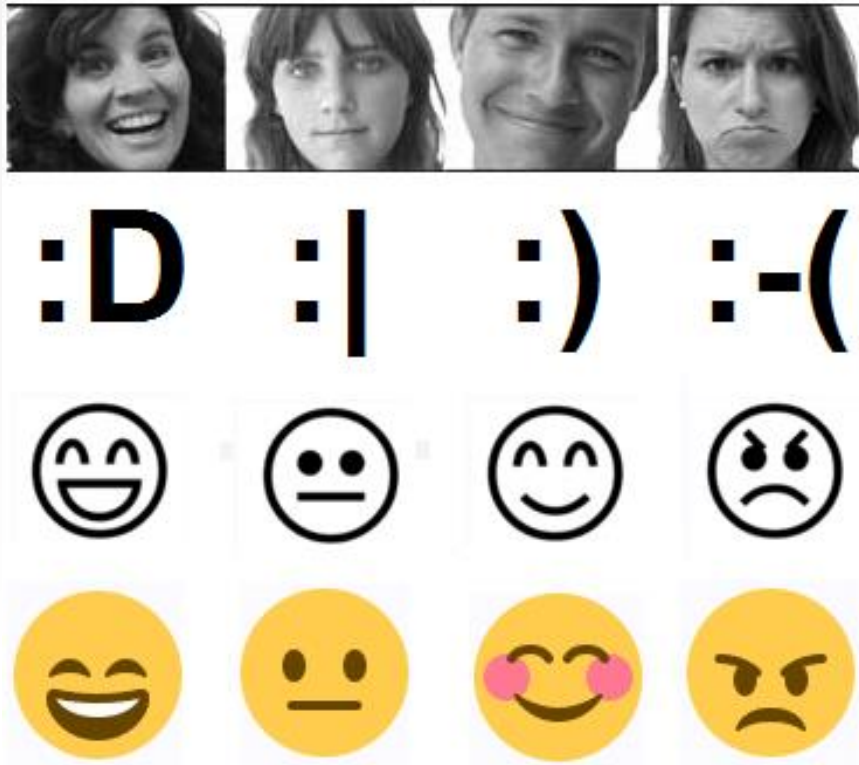
Zakaj  Emoji?



KO SPOROČAMO ČUSTVA NARAVNANJE (ATTITUDE) ...

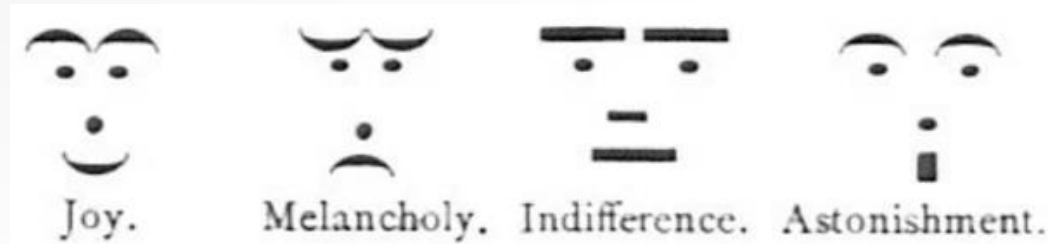


Čustvenčki v umu



Novost?

- Puck Magazine, 1881



- 19. september 1982

19-Sep-82 11:44 Scott E Fahlman :-)
From: Scott E Fahlman <Fahlman at Cmu-20c>

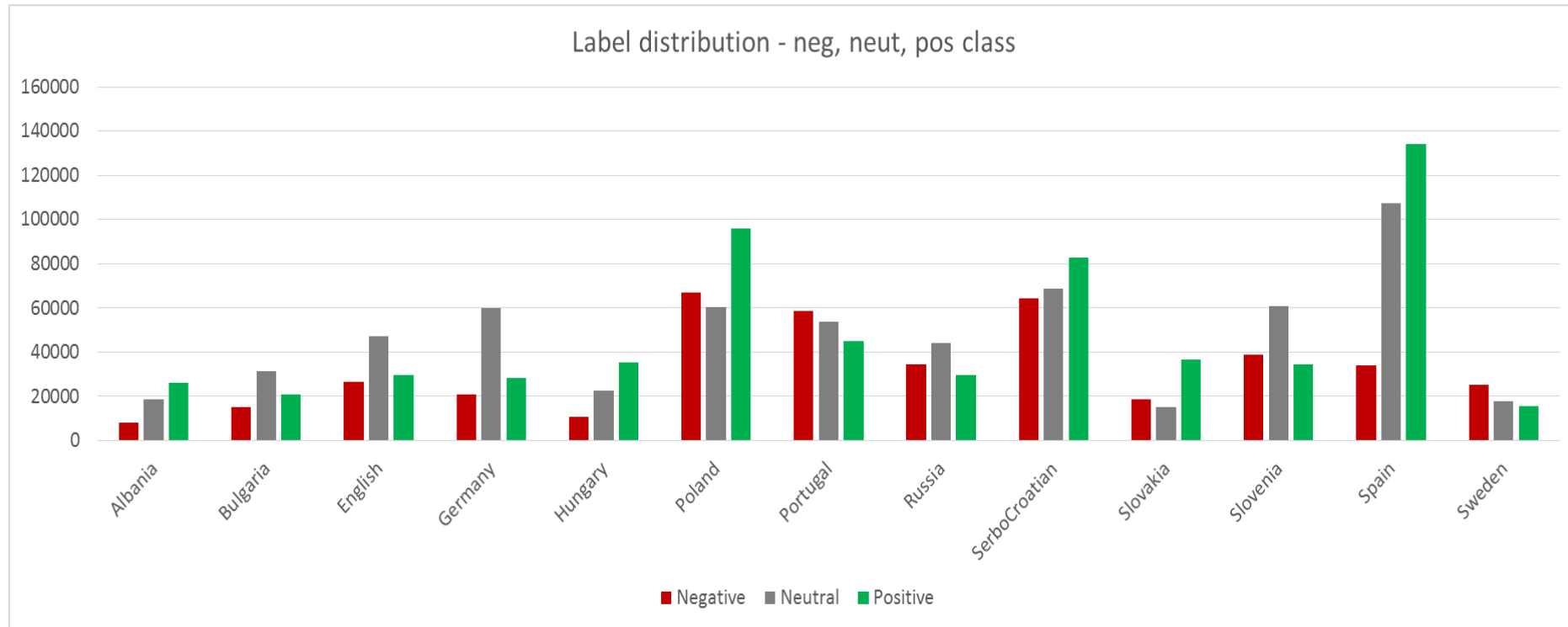
I propose that the following character sequence for joke markers:

:-)

Read it sideways. Actually, it is probably more economical to mark things that are NOT jokes, given current trends. For this, use

:-(

Vloga anotatorjev pri analizi razpoloženja



1.5 milijonov ročno označenih tvitov za razpoloženje, 13 jezikov → klasifikatorje razpoloženja

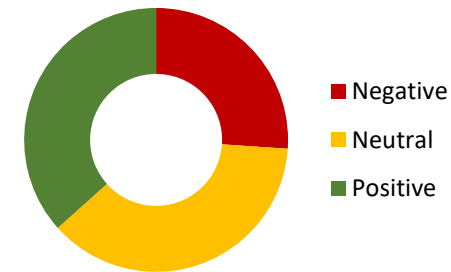
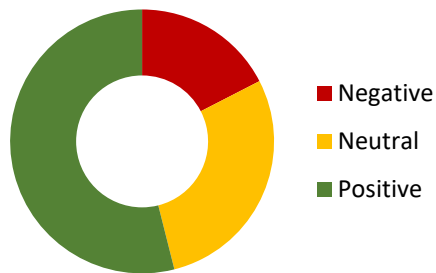
Mozetič, I., Grčar, M. and Smailović, J., 2016. Multilingual Twitter sentiment classification: The role of human annotators. *PloS one*, 11(5), p.e0155036.

Tviti, ki imajo emojije...



Sentiment	Tweets with emojis	Tweets without emojis
<i>Negative</i>	12,156 (17,5%)	410,301 (26,1%)
<i>Neutral</i>	19,938 (28,6%)	587,337 (37,3%)
<i>Positive</i>	37,579 (53,9%)	576,424 (36,6%)
Total	69,673	1,574,062
Mean	+0.365	+0.106
SD, SEM	0.762, 0.0029	0.785, 0.0006

doi:10.1371/journal.pone.0144296.t002



... so bolj **pozitivni**.

Strinjanje anotatorjev glede razpoloženja...



Agreement measure	Tweets with emojis	Tweets without emojis
<i>Alpha</i>	0.597	0.495
<i>Accuracy</i>	0.641	0.583
$\overline{F}_1(-, +)$	0.698	0.598
No. of tweets annotated twice	3,547	52,027

doi:10.1371/journal.pone.0144296.t003

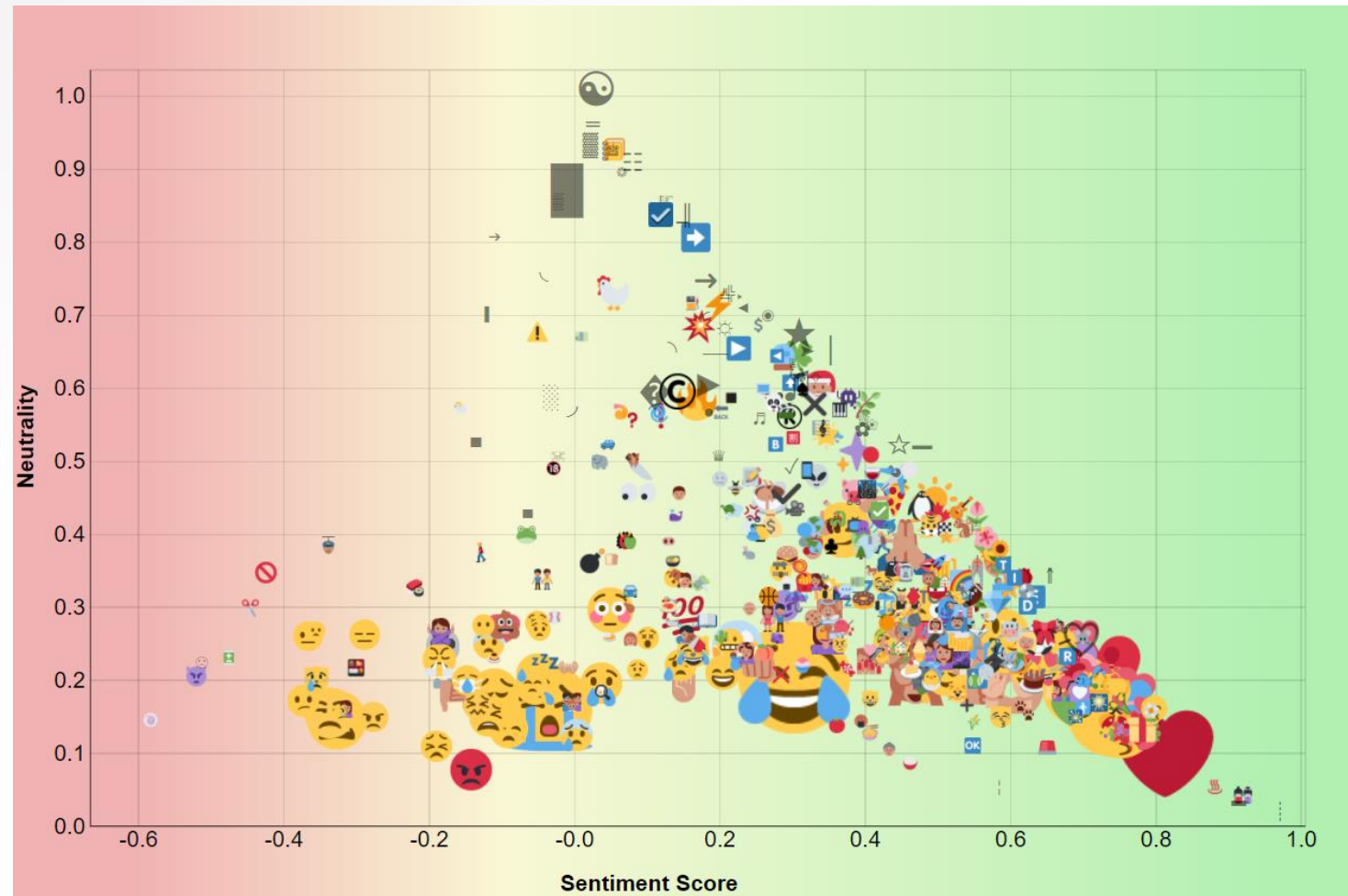
... je veliko večje, če je v tvitu emoji.

Emoji Sentiment Lexicon

http://kt.ijs.si/data/Emoji_sentiment_ranking/

Char	Image [twemoji]	Unicode codepoint	Occurrences [5...max]	Position [0...1]	Neg [0...1]	Neut [0...1]	Pos [0...1]	Sentiment score [-1...+1]	Sentiment bar (c.i. 95%)	Unicode name	Unicode block
😊		0x1f602	14622	0.805	0.247	0.285	0.468	0.221		FACE WITH TEARS OF JOY	Emoticons
♥		0x2764	8050	0.747	0.044	0.166	0.790	0.746		HEAVY BLACK HEART	Dingbats
♥		0x2665	7144	0.754	0.035	0.272	0.693	0.657		BLACK HEART SUIT	Miscellaneous Symbols
😍		0x1f60d	6359	0.765	0.052	0.219	0.729	0.678		SMILING FACE WITH HEART-SHAPED EYES	Emoticons
😭		0x1f62d	5526	0.803	0.436	0.220	0.343	-0.093		LOUDLY CRYING FACE	Emoticons
😘		0x1f618	3648	0.854	0.053	0.193	0.754	0.701		FACE THROWING A KISS	Emoticons
😊		0x1f60a	3186	0.813	0.060	0.237	0.704	0.644		SMILING FACE WITH SMILING EYES	Emoticons
👌		0x1f44c	2925	0.805	0.094	0.249	0.657	0.563		OK HAND SIGN	Miscellaneous Symbols and Pictographs
💕		0x1f495	2400	0.766	0.042	0.285	0.674	0.632		TWO HEARTS	Miscellaneous Symbols and Pictographs
👏		0x1f44f	2336	0.787	0.104	0.271	0.624	0.520		CLAPPING HANDS SIGN	Miscellaneous Symbols and Pictographs

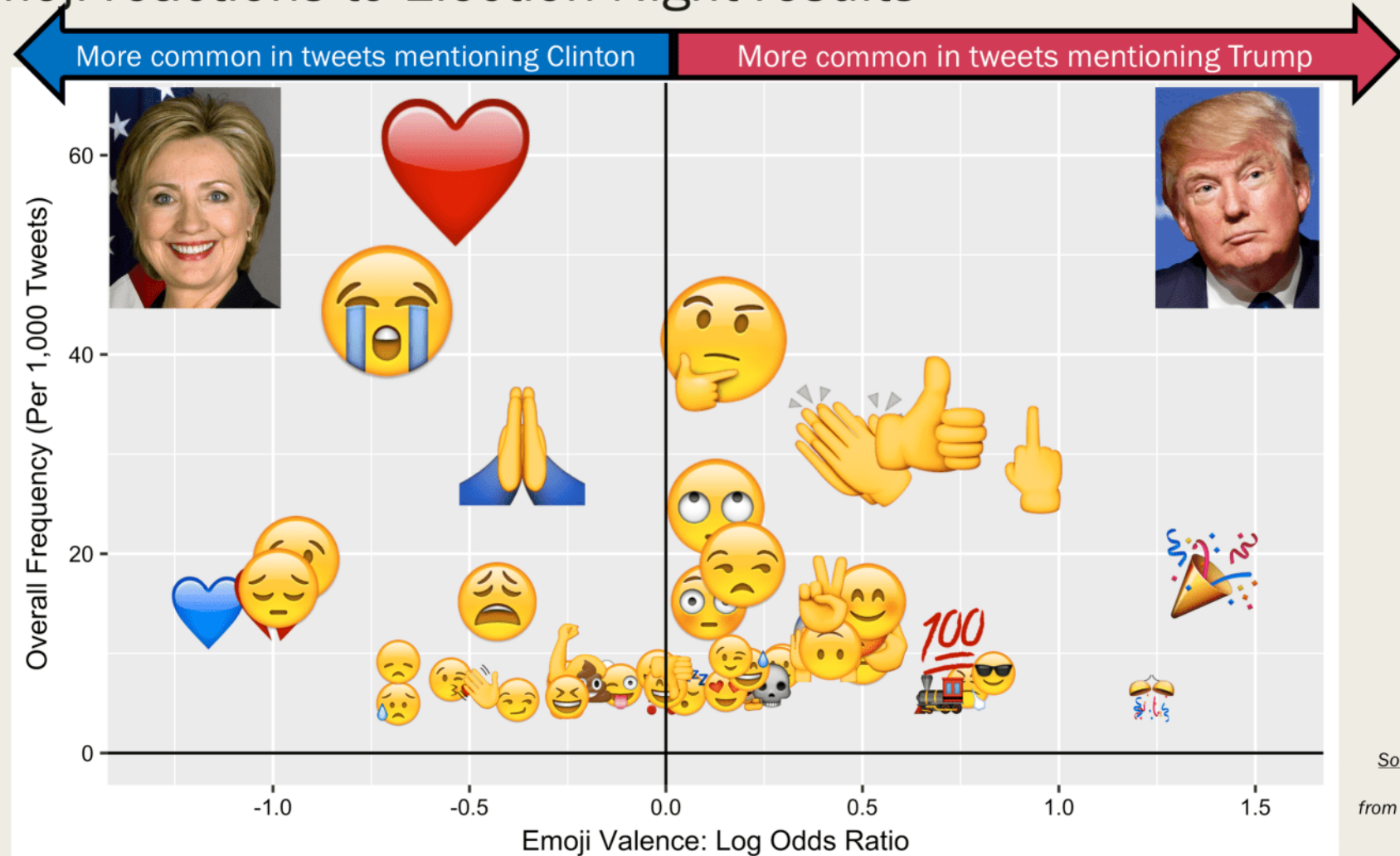
Emoji sentiment map



Kralj Novak, P., Smailović, J., Sluban, B. and Mozetič, I., 2015. Sentiment of emojis. *PloS one*, 10(12), p.e0144296.

<http://prismoji.com>

Emoji reactions to Election Night results



Source: Analysis of sampled
Election Night tweets,
from Nov. 9, 2016 12:00am –
3:30am EST.
(PRISMOJI)

Analiza stališč

- Analiza stališč (stance analysis) je področje tekstovnega rudarjenja, ki se ukvarja z avtomatskim odkrivanjem, ali se pisec besedila **strinja**, **nasprotuje** ali je **nevtralen** do določenega vprašanja.



Analiza stališč: za Pahorja?

Lepo, ko nekdo reče, da **Pahor** vliva upanje mladim. Kaj pa, če bi mlade vprašali, kakšen bi bil odgovor? [#volitve2012](#)

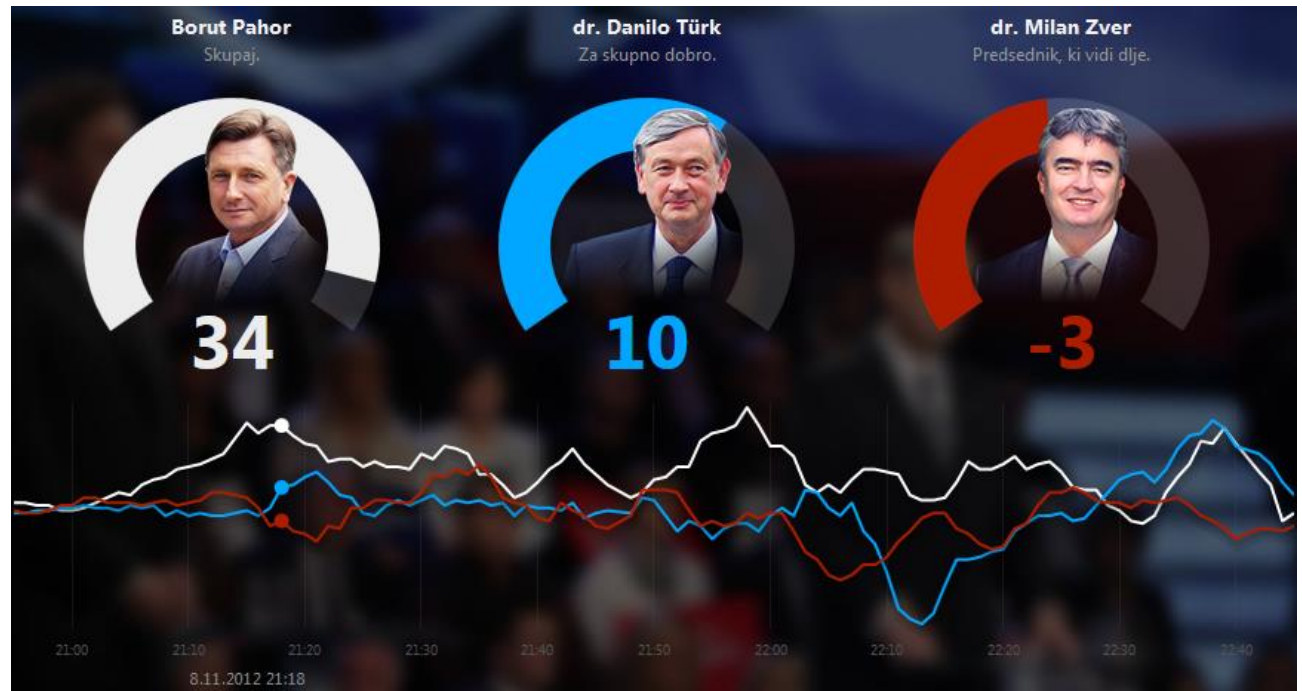
Čez nekaj minut V ŽIVO na POP TV in [24ur.com](#): Borut **Pahor** in Danilo Türk iz oči v oči [volitve.24ur.com//a/z13rpr](#) [#volitve2012](#)

Borut **Pahor**: From zelo to hero in one year. [#volitve2012](#)

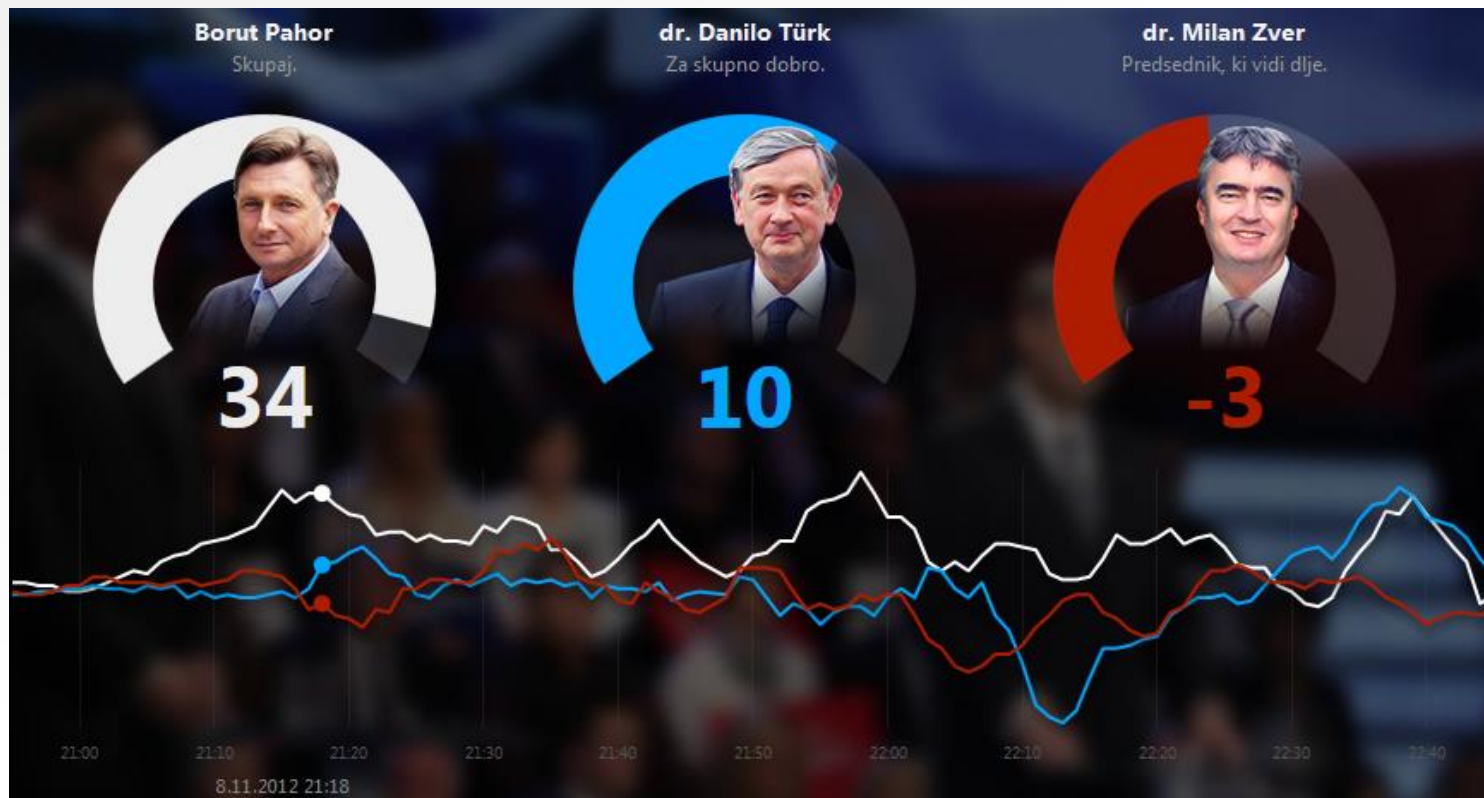
jooj, **pahor** take presledke dela med govorom, sploh ne morem sledit temu kar želi povedat [#volitve2012](#)

Slovenske predsedniške volitve 2012

- Analiza stališč na ročno označenih Twitter podatkih:
 - Vsak za vsakega kandidata označimo, če je **za**, **nevturalen** ali **proti**
 - 3x SVM model z linearnim jedrom

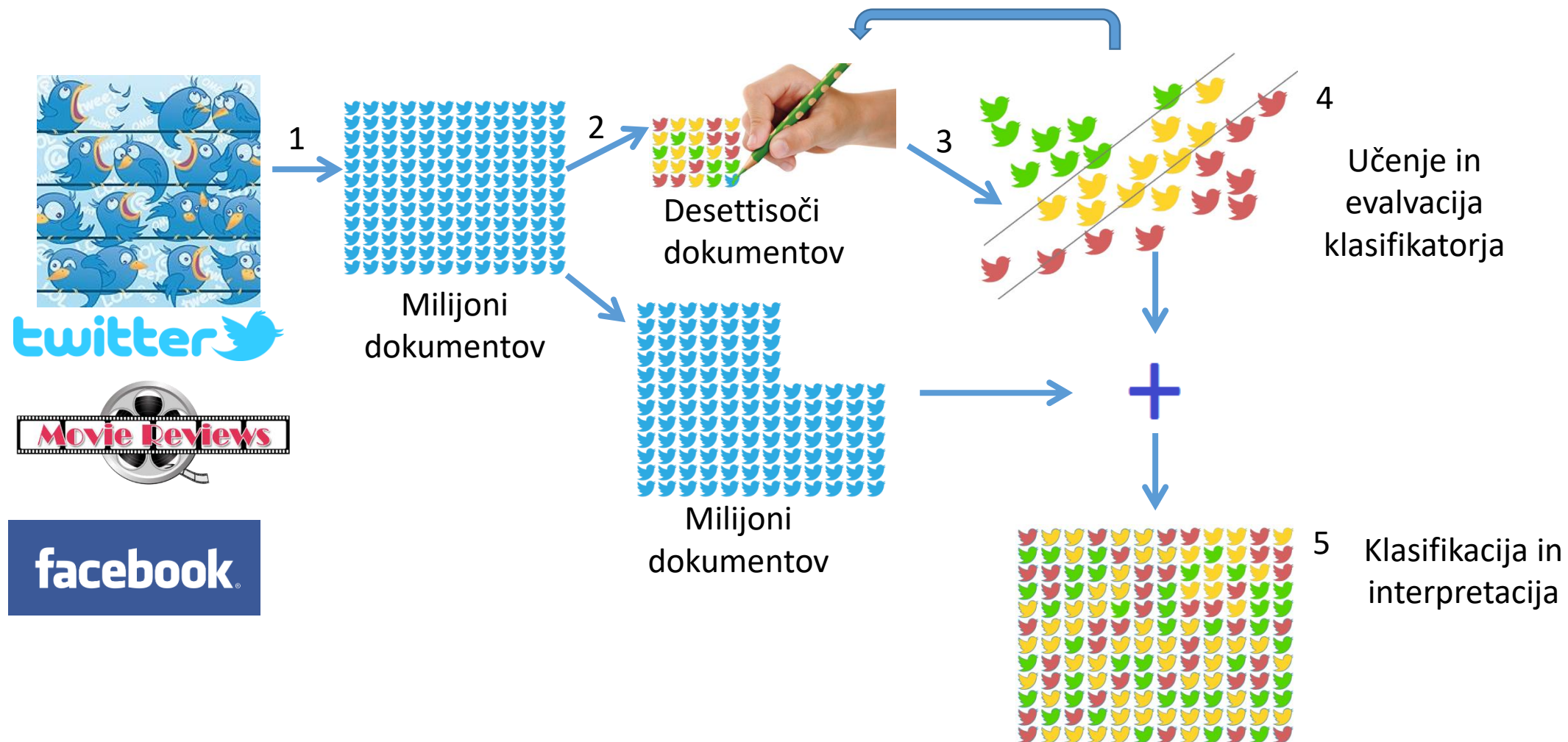


Slovenske predsedniške volitve 2012

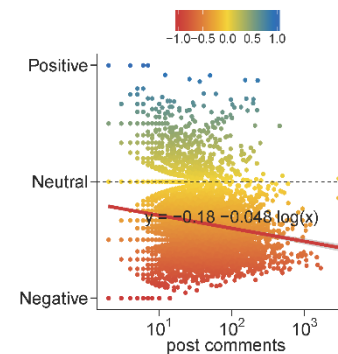
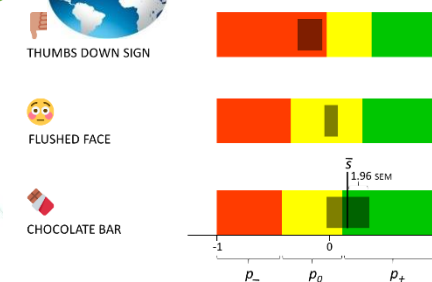
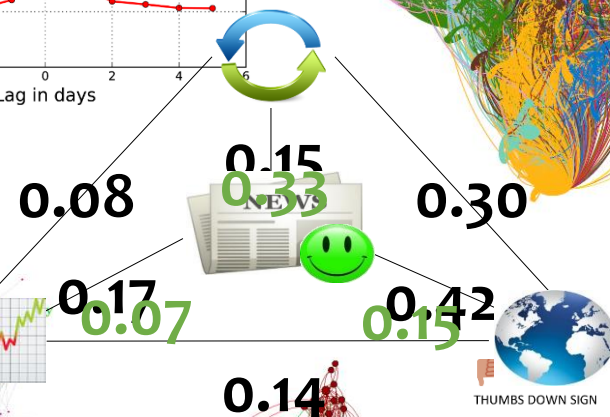
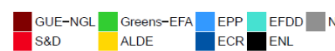
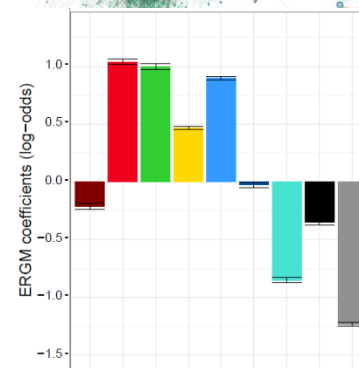
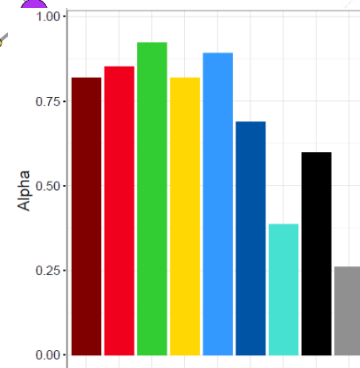
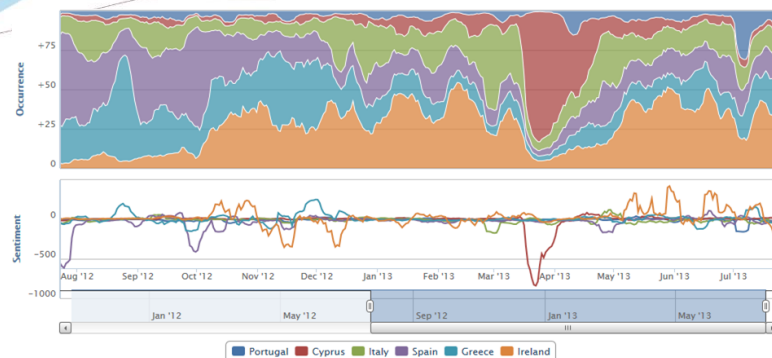
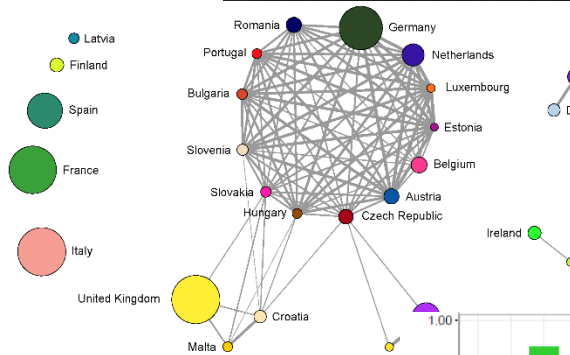
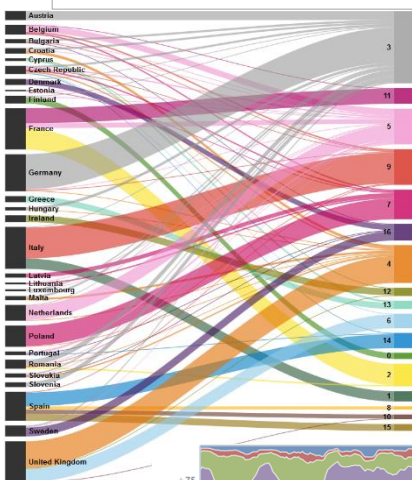
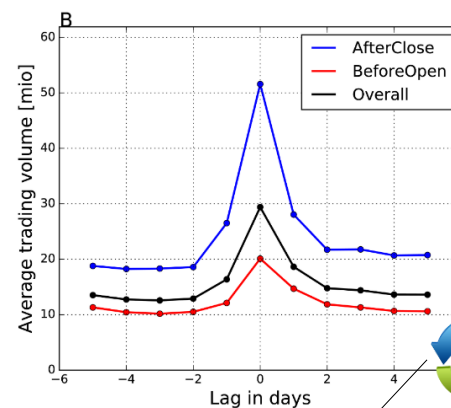
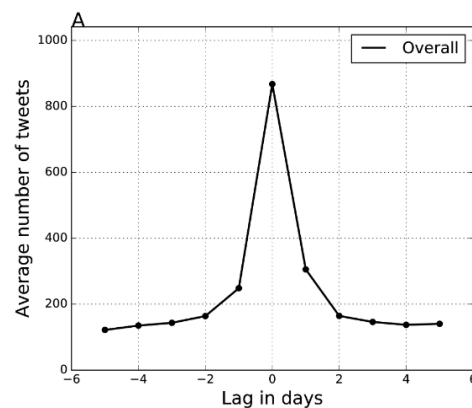
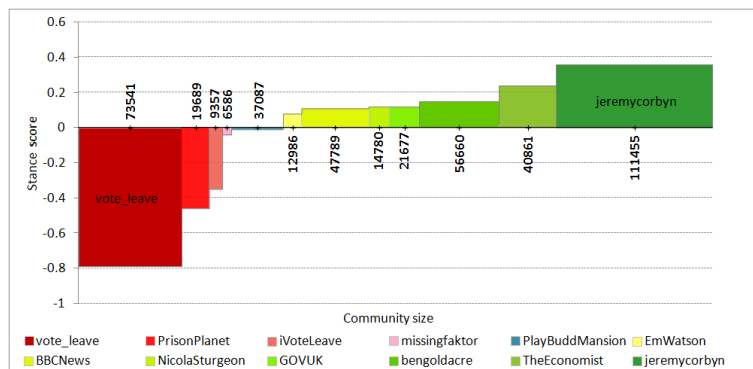


- Analiza stališč v živo med soočenji na POP TV
- Ob koncu vsakega soočenja je novinar Denis Oštir komentiral rezultate analize stališč
- Na Twitterju je bil Pahor favorit

Delotok analize stališč



Analiza stališč



Ekipa

Igor
Mozetič



Miha
Grčar



Borut
Sluban



Darko
Cherepnalkoski



Matjaž
Juršič



Sašo
Rutar



Darko
Aleksovski



Jasmina
Smailović



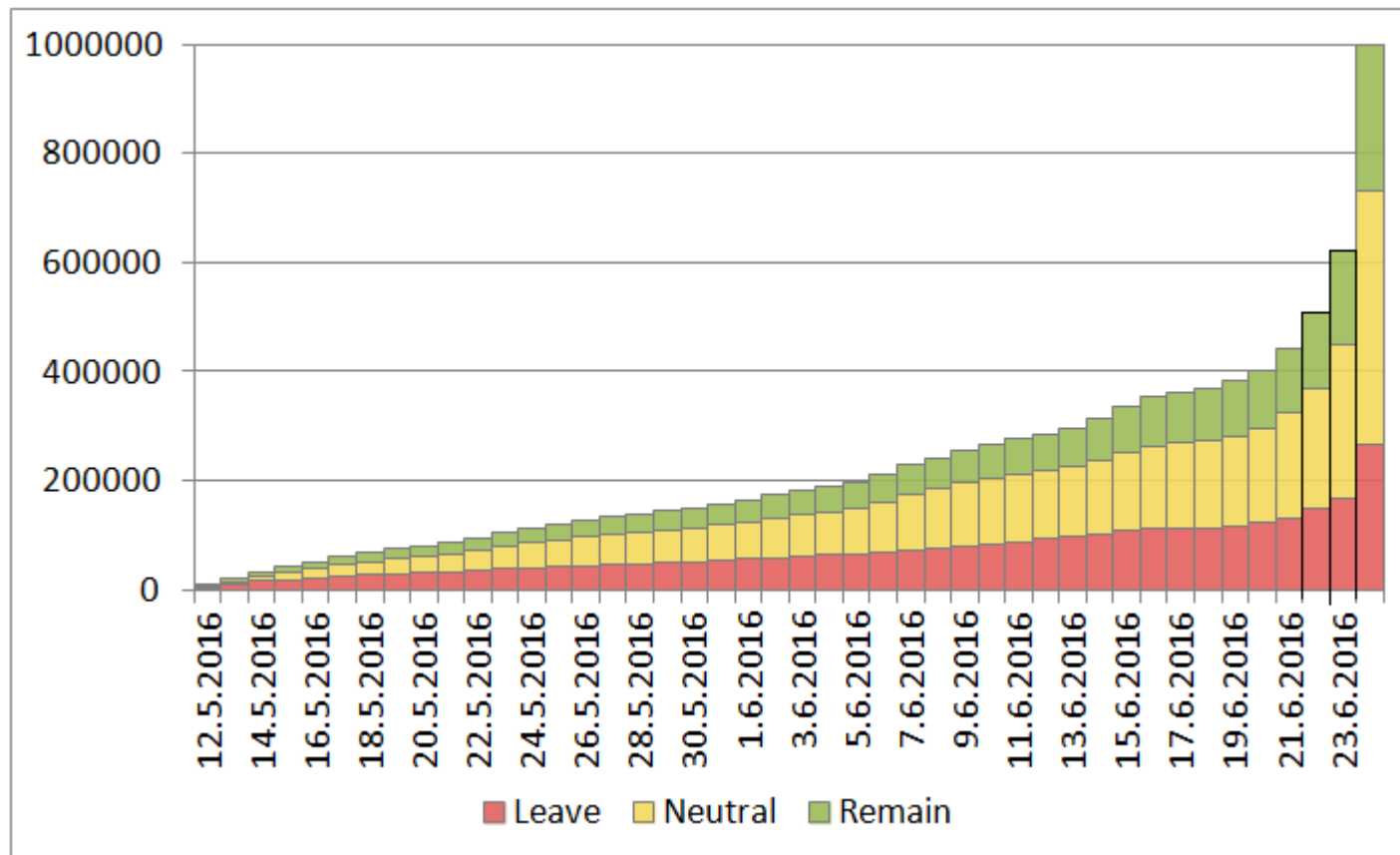
Petra
Kralj Novak



Brexit: stališča in vpliv Twitter uporabnikov

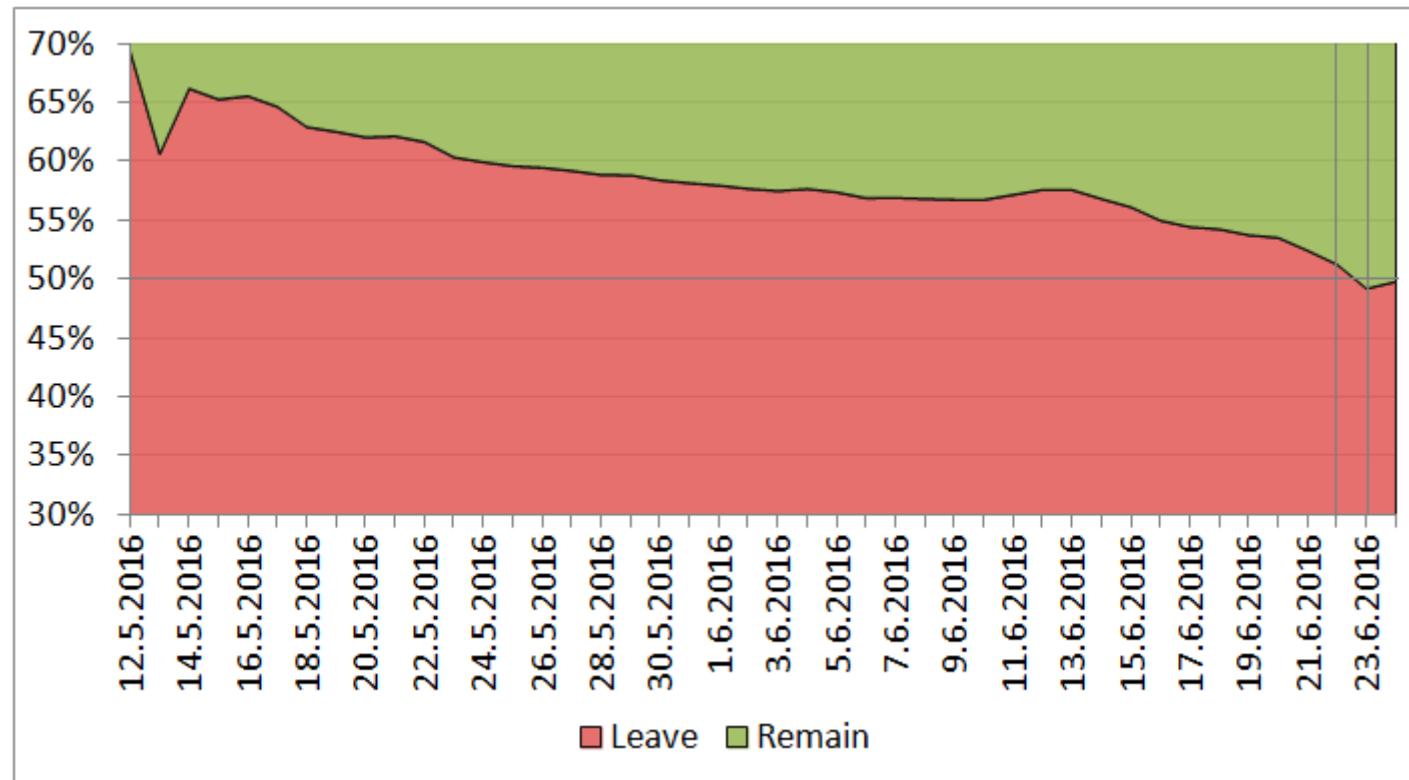
Grčar, Miha, Darko Cherepnalkoski, Igor Mozetič, and Petra Kralj Novak. "Stance and influence of Twitter users regarding the Brexit referendum." *Computational social networks* 4, no. 1 (2017): 6.

Brexit: število Twitter uporabnikov

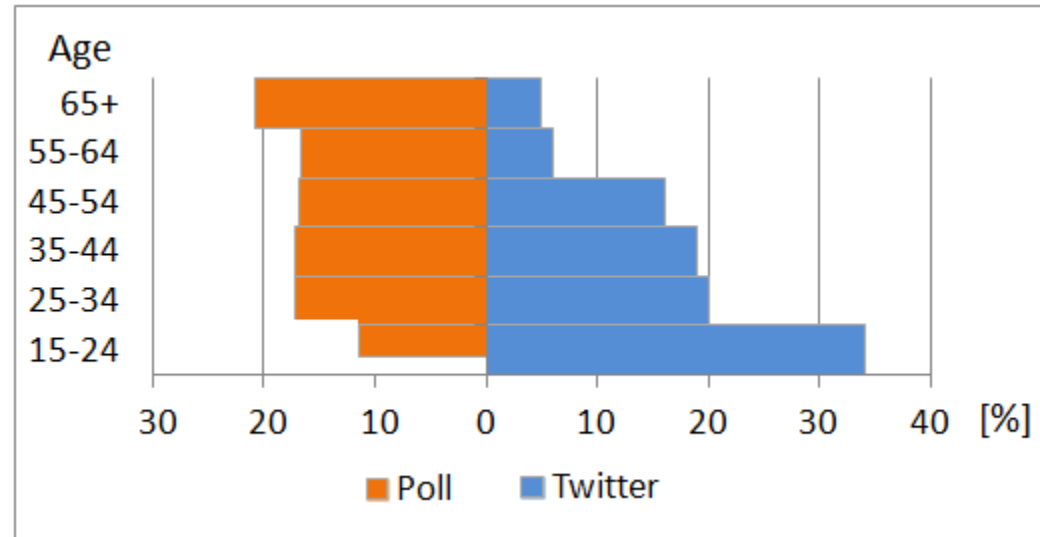


- 4.5 milijonov tvitov
- Milijon uporabnikov
- “geo-locirani” v VB (35-45%)

Brexit: stališče Twitter uporabnikov



Demografija: ankete in Twitter

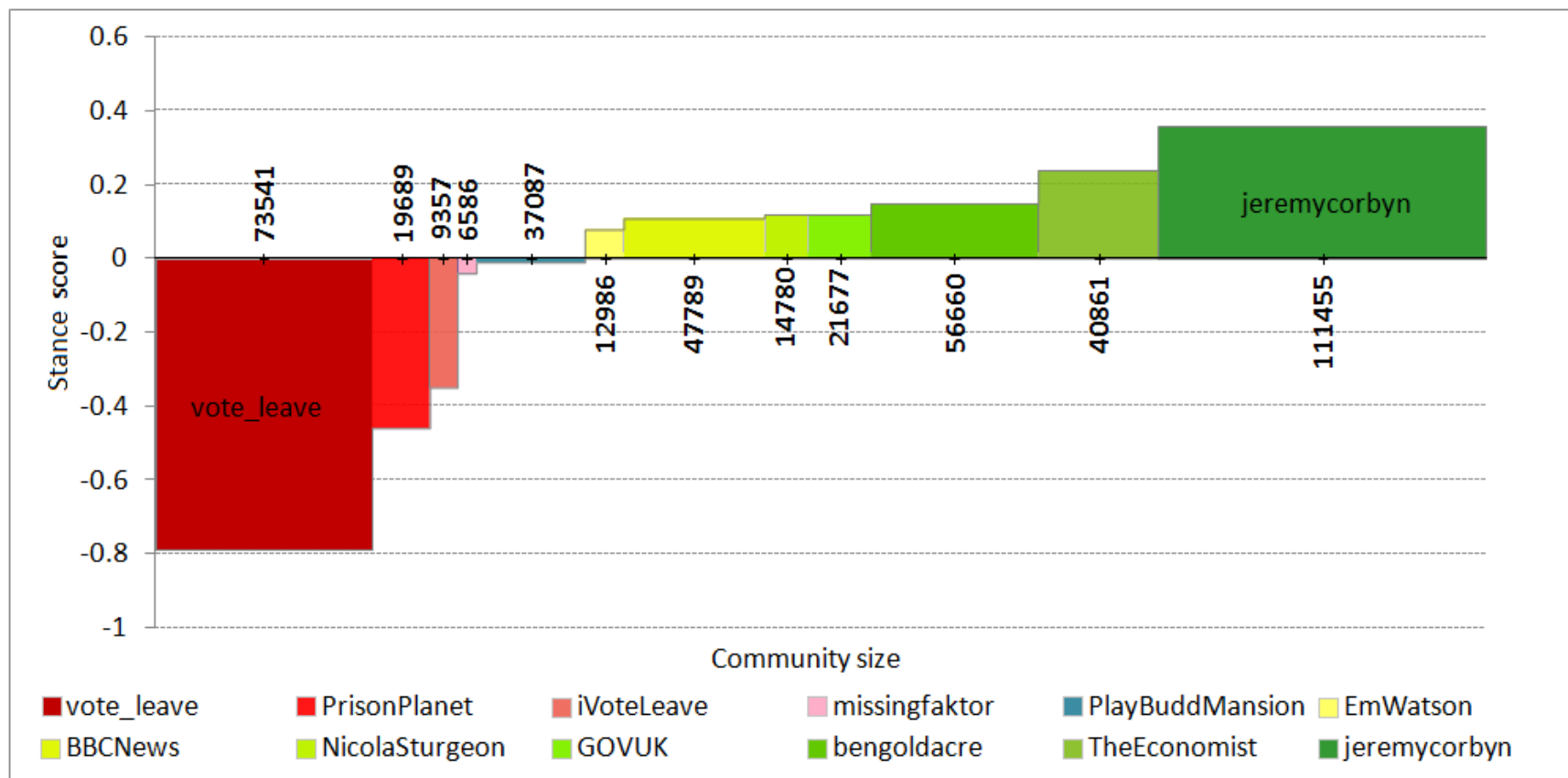


	18-24		25-49		50-64		65+		Prediction
		%Leave		%Leave		%Leave		%Leave	%Leave
Poll results	0.116	25	0.428	44	0.246	56	0.210	61	50.3
Projection to Twitter demo.	0.261	25	0.526	44	0.146	56	0.067	61	41.9
Twitter actual	0.261	29	0.526	52	0.146	66	0.067	72	49.2
Poll adjusted	0.116	29	0.428	52	0.246	66	0.210	72	59.1

Twitter vplivneži: Hirsch index

Twitter user	tweets	retweeted tweets	total retweets	<i>h</i> -index
Leave:				
@vote_leave (Vote Leave)	1,567	1,004	256,463	297
@theordinaryman2 (TheOrdinaryMan)	1,736	1,660	86,728	128
@Vote_LeaveMedia (Vote Leave Media)	1,208	891	40,379	100
@PrisonPlanet (Paul Joseph Watson)	136	107	33,960	89
@RedHotSquirrel (Robert Kimbell)	1,034	579	17,090	62
@davidicke (David Icke)	78	70	6,996	62
@DVATW (David Vance)	338	273	14,225	61
@labourleave (Labour Leave)	162	93	11,263	55
@ukleave_eu (#Brexit #Article50)	954	278	8,503	52
@EUVoteLeave23rd (SUPPORTING BREXIT)	3,833	1,439	18,492	52
Remain:				
@guardian (The Guardian)	434	356	19,304	70
@Independent (The Independent)	566	356	14,575	60
@TheGreenParty (Green Party)	132	83	8,894	51
@itvnews (ITV News)	383	248	8,783	45
@UK_News (UK News)	95	97	5,894	40
@BBCr4today (BBC Radio 4 Today)	153	119	6,399	39
@UKLabourIN (LabourInForBritain)	92	61	4,068	37
@The_TUC (TradesUnionCongress)	187	180	4,574	34
@wdjstraw (Will Straw)	116	85	3,805	33
@LibDems (Liberal Democrats)	155	66	3,765	33

Polarizirane skupnosti



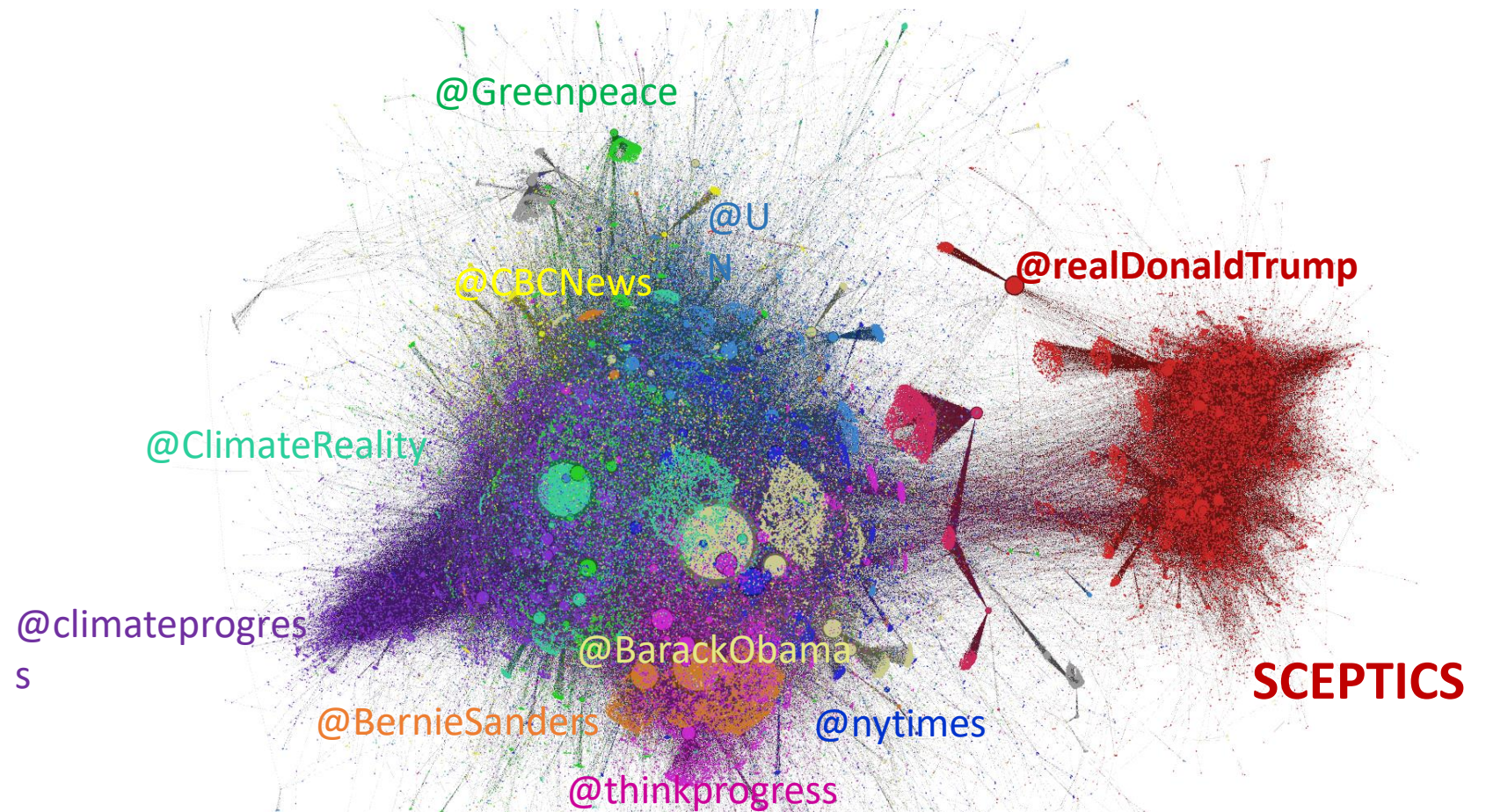
M. Grčar, D. Cherepnalkoski, I. Mozetič, P. Kralj Novak. **Stance and influence of Twitter users regarding the Brexit referendum**, [Computational Social Networks 4: 6](#), 2017.

Stališča o okoljskih tematikah

Sluban, B., Smailović, J., Battiston, S. and Mozetič, I., 2015. Sentiment leaning of influential communities in social networks. Computational Social Networks, 2(1), p.9.

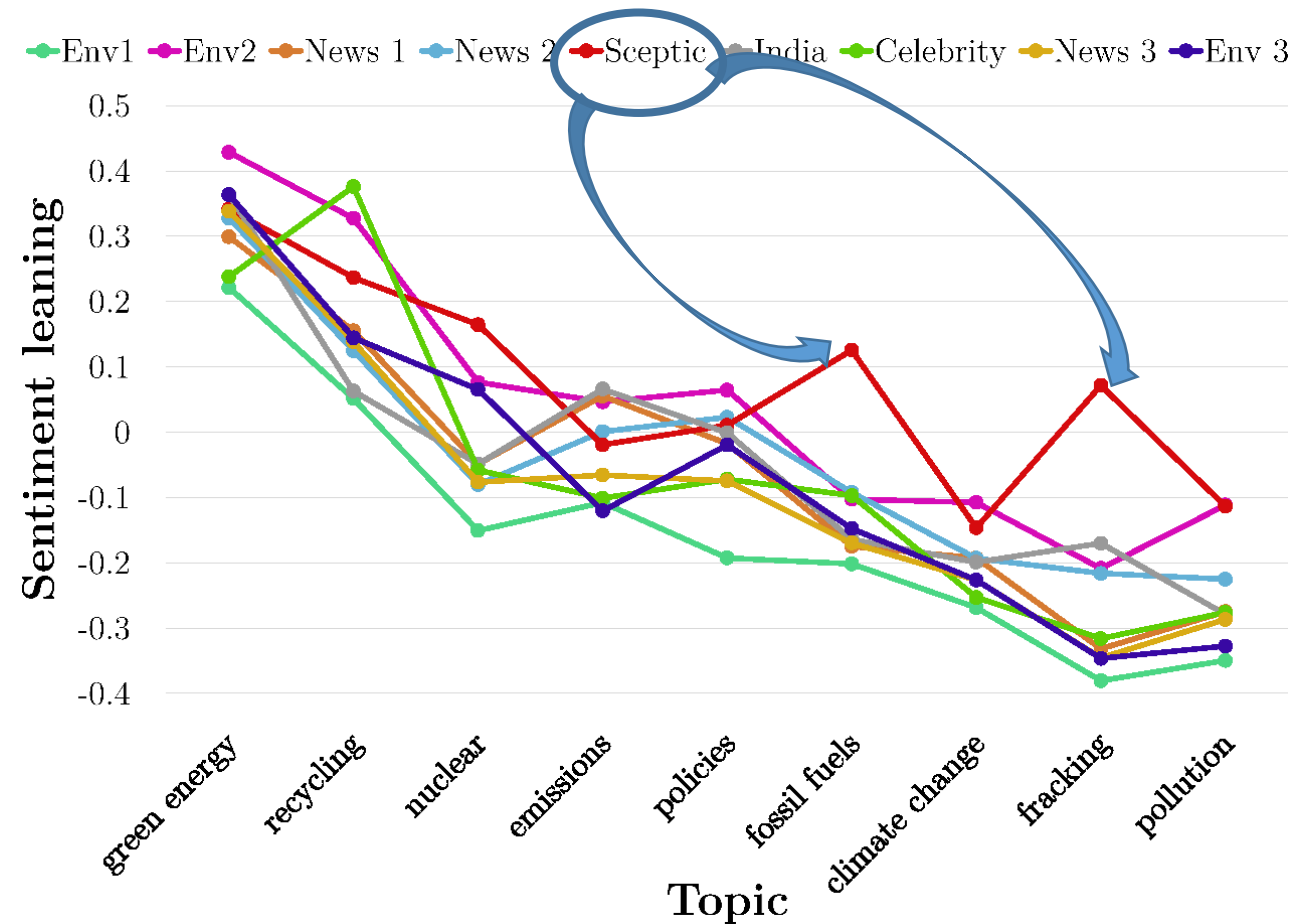


skupnosti (retweet communities)



Sluban, B., Smailović, J., Battiston, S. and Mozetič, I., 2015. Sentiment leaning of influential communities in social networks. Computational Social Networks, 2(1), p.9.

Naklonjenost “retweet” skupnosti posameznim okoljskim temam



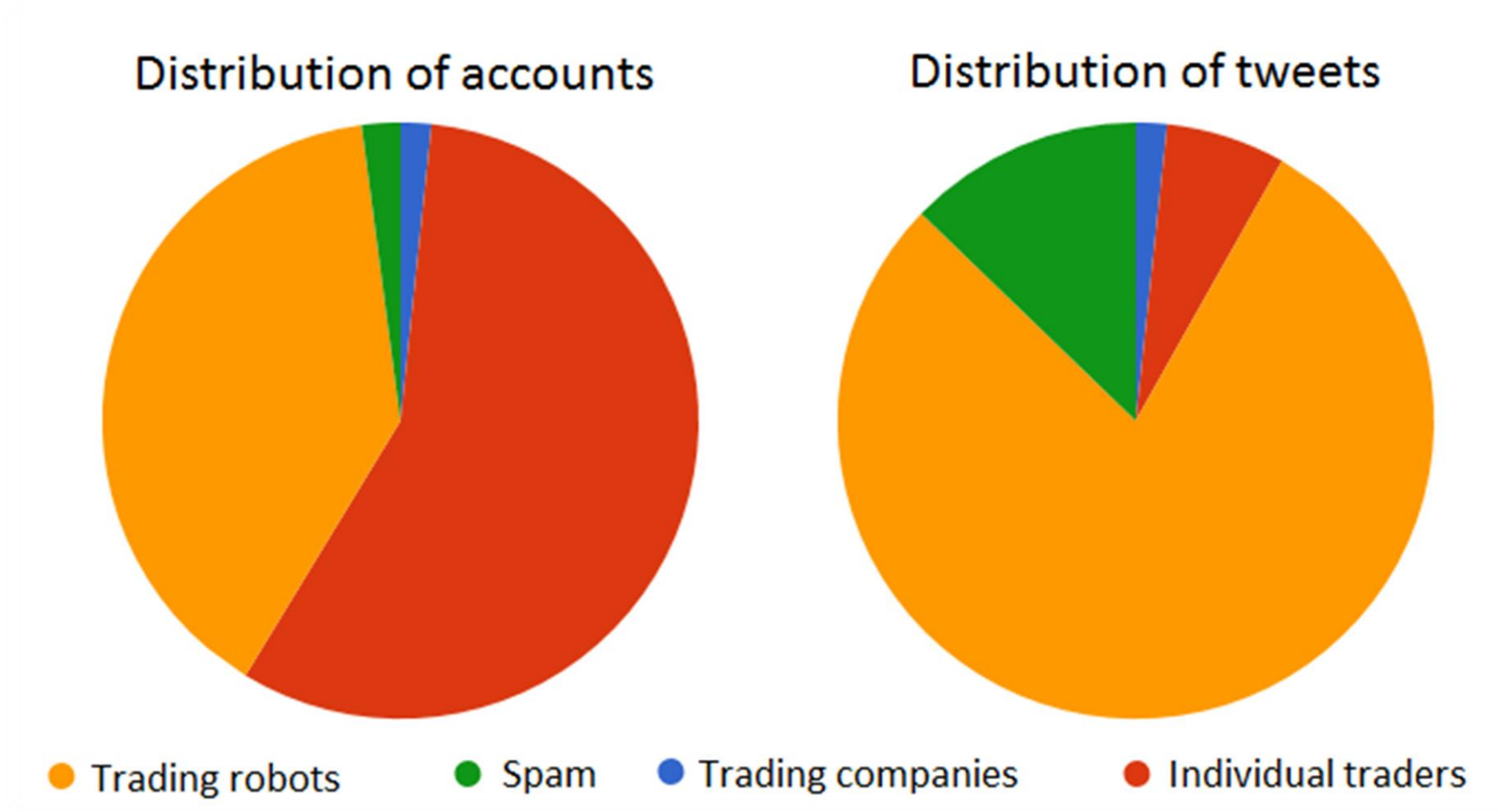
Sluban, B., Smailović, J., Battiston, S. and Mozetič, I., 2015. Sentiment leaning of influential communities in social networks. Computational Social Networks, 2(1), p.9.



Signali za Forex trgovanje

Mozetic, I., Gabrovšek, P. and Kralj Novak, P., Forex trading and Twitter: spam, bots, and reputation manipulation, MIS2: Misinformation and Misbehavior Mining on the Web

Kategorije Twitter uporabnikov



Kategorije uporabnikov in njihova stališča

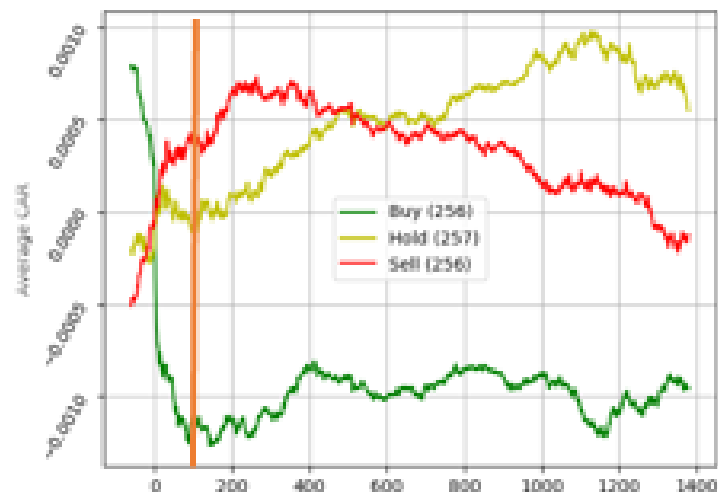


- 44.000 ročno označenih tvitov: **buy**, **hold**, or **sell** (EUR vs. USD)
- Dvo-ravninski SVM model za ordinalno klasifikacijo
 - Klasifikacijska točnost = 0.811
 - $F1 = 0.810$

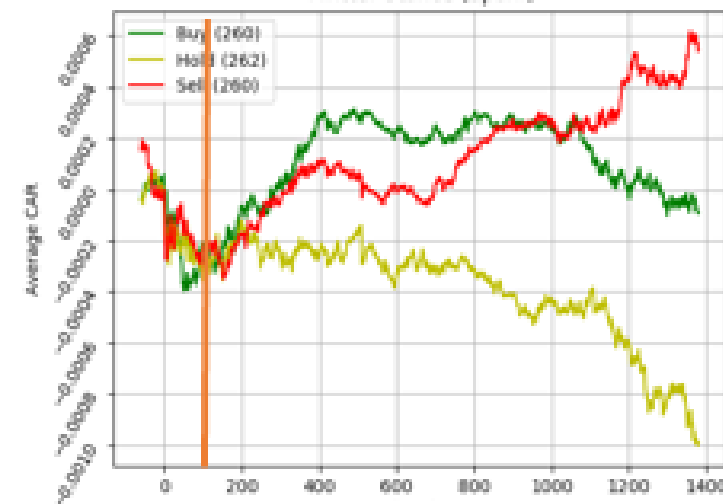
Forex trgovanje: **buy**, **hold**, or **sell**

- “Event study” metodologija za kategorije uporabnikov

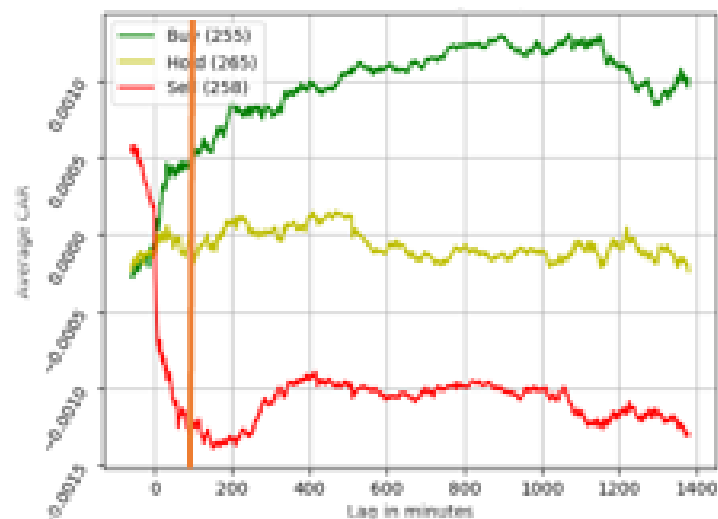
Trading robots



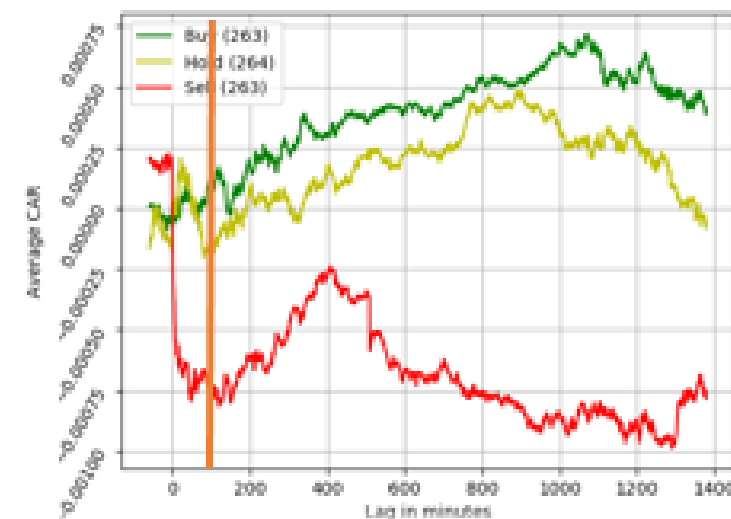
Spam



Trading companies



Individual traders



Razpoloženje in širjenje lažnih informacij na Facebooku

Zollo, F., P. K. Novak, M. Del Vicario, A. Bessi, I. Mozetič, and A. Scala. "Emotional Dynamics in the Age of Misinformation." *PLoS ONE* 10, no. 9 (2015): e0138740.

Facebook: rumeni paradižnik

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[Prejšnja](#) · [Naslednja](#)

MASSIMA ATTENZIONE!!!

NUOVA MOSTRUOSITA' DAL MONDO OGM

CON LA LEGGE SUL LIBERO USO DI **ORTAGGI GENETICAMENTE
MODIFICATI**

ARRIVA DALL'AMERICA IL

POMODORO GIALLO



CON AGGIUNTA DI

RAME, MANGANESE, FLUORO E FORGONIO

VERRA' UTILIZZATO NELLA PRODUZIONE DI
SCIROPPI E MEDICINE OMEOPATICHE

[Všeč mi je](#)

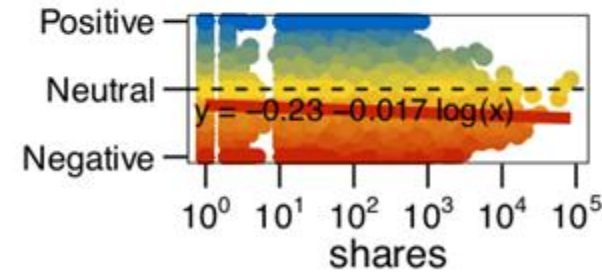
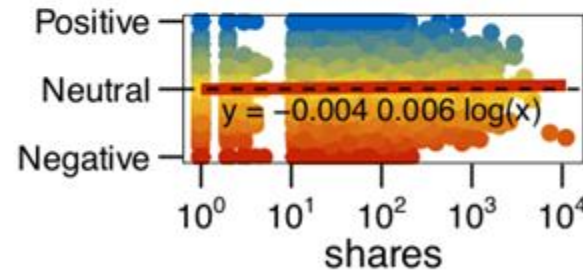
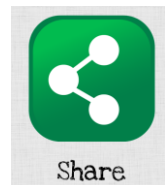
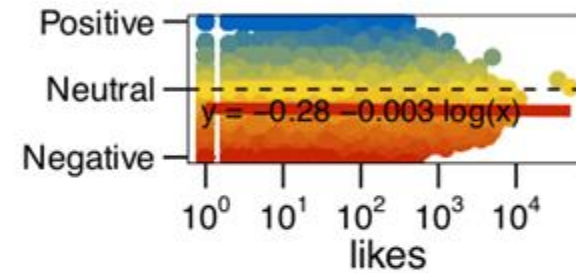
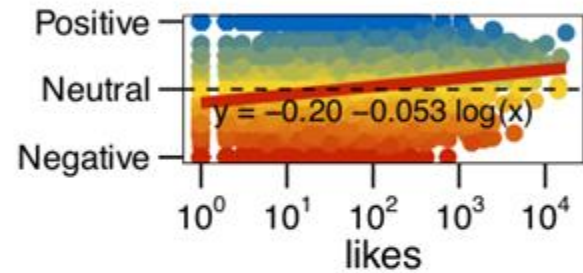
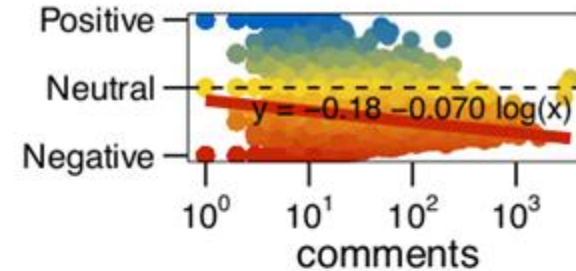
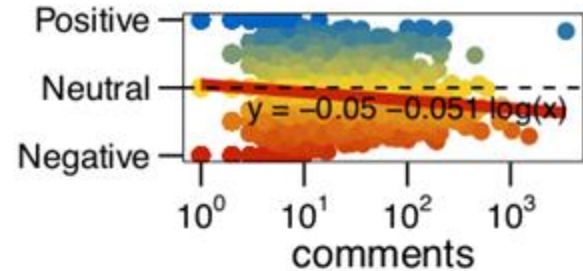
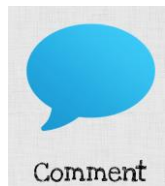
[Komentiraj](#)

Simply Humans

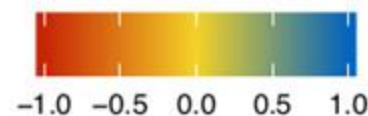
Osebe, ki



Facebook: znanost in zarote

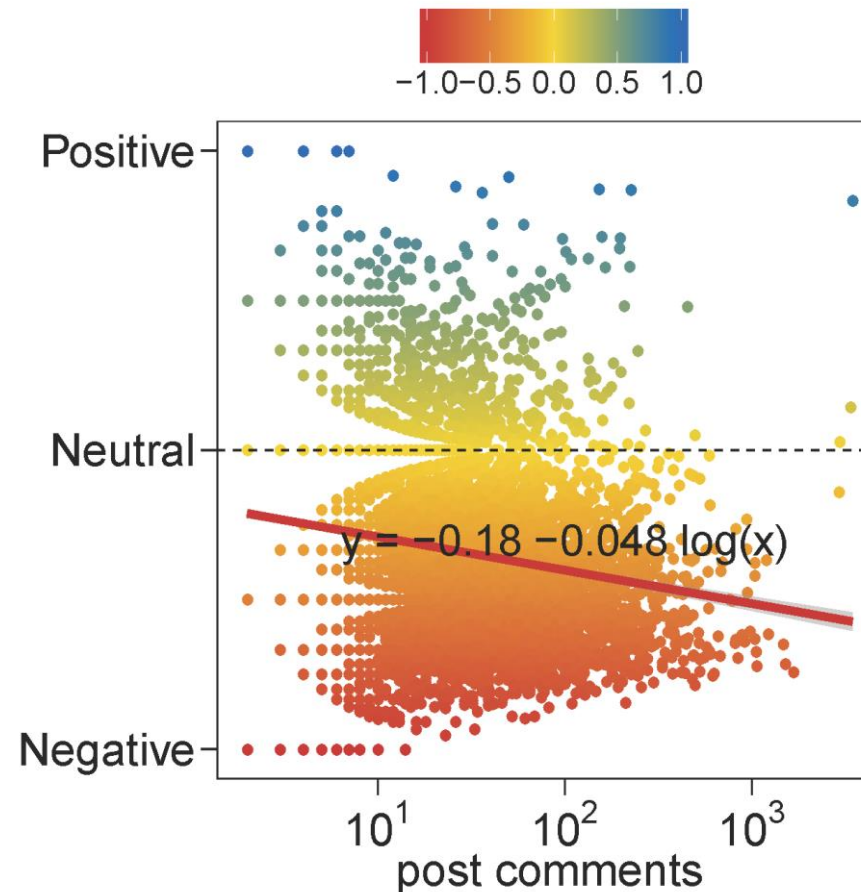


Science



Conspiracy

Facebook: razporežanje v komentarjih



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Trenja stališč in čustvenčki v žarišču ?

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