

DMI 19

Algorithm exposed: investigating Youtube

Claudio Agosti
Davide Beraldo
Stefano Calzati
Zoé Charpentier
SeongIn Choi
Luca Del Fabbro

Anja Groten
Concetta La Mattina
Salvatore Romano
Giovanni Rossetti
Laura Swietlicki
Jeroen de Vos



As algorithms take over, YouTube's recommendations highlight a human problem

A supercomputer playing chess against your mind to get you to keep watching.

The Faults Beyond Our Algorithms

The offline roots of online radicalization.

How YouTube changed the world
by The Telegraph



Algorithms Won't Fix What's Wrong With YouTube

What seems like a sensible decision to an algorithm can be a terrible misstep to a human.



YouTube, the Great Radicalizer



research questions e.g:

- What does polarisation look like on Youtube? (political vs a-political)
- Which are the variables that impact the most? (google / exposure time / past behaviors / personalized profiles)
- How can we distinguish between personalization and randomness?

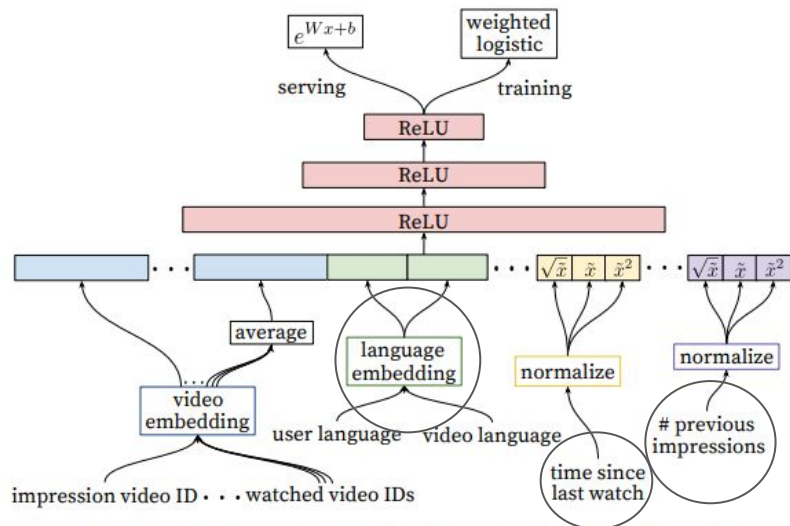
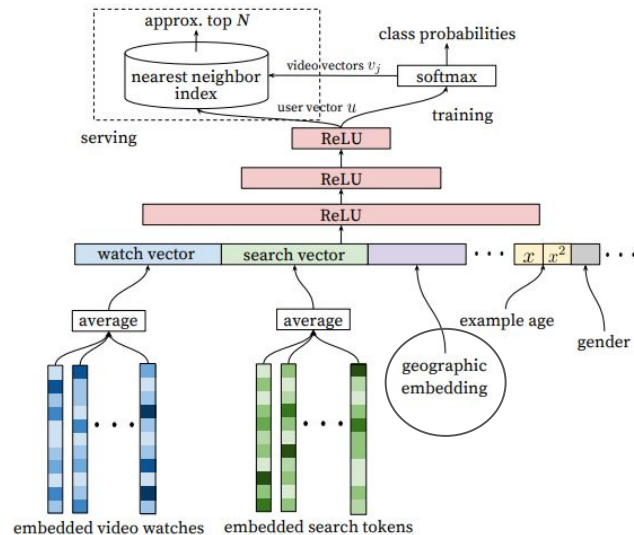


Figure 7: Deep ranking network architecture depicting embedded categorical features (both univalent and multivalent) with shared embeddings and powers of normalized continuous features. All layers are fully connected. In practice, hundreds of features are fed into the network.



(Covington, Adams and Segrin, 2016)

<https://youtube.tracking.exposed>

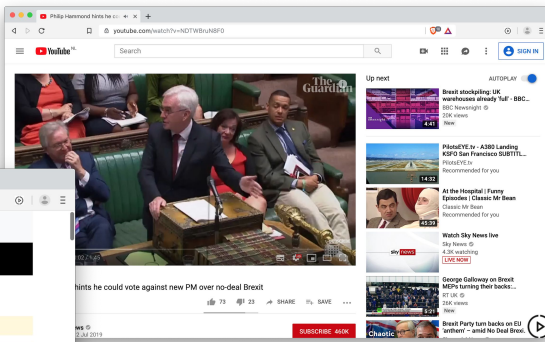
ytTREX code repository play with the data about us

Personal interface: this link is only know by you; keep it private

Download the [CSV of your last activities](#). Please note, this is working prototype for researcher, this interface is not yet ready for usage. [check the code](#), or get in touch: [support at tracking dot exposed](#)

2 minutes ago

PSY - GANGNAM STYLE(강남스타일) M/V	officialpsy	3,375,218,988 views	Related: #19
1 PSY - GENTLEMAN M/V	2 Top 10 FUNNY Auditions Britain's Got Talent 2017	3 Maroon 5 - Payphone (Lyric Video) ft. Wiz Khalifa	4 Katy Perry - Dark Horse (Official) ft. Juicy J
5 Queen - Live at LIVE AID 1985/07/13	6 LMFAO - Sexy and I Know It (Official Video)	7 PSY (ft. HYUNA) - 오빤 딱 내 스타일 M/V	8 Tape Face Auditions & Performances America's Got Talent 2016 Finalist
9 Jennifer Lopez - On The Floor ft. Pitbull	10 Bomfunk MC's - Freestyler (Video Original Version)	11 Katy Perry - Hot N Cold (Official)	12 LMFAO ft. Lauren Bennett, GoonRock - Party Rock Anthem (Official Video)
13 Aseréjé (The Ketchup Song) [Spanish Version] - Las Ketchup	14 Lady GaGa - Poker Face [Official Music Video] HQ	15 Ed Sheeran - Shape of You [Official Video]	16 PSY - 'New Face' M/V



ytTREX github repo play with the data about

Compare how the same video get different recommendations

35 times has been seen this video, and YT gave 665 related videos

[PSY - GANGNAM STYLE\(강남스타일\) M/V](#),
[download CSV], [re-play □]

Videos present among the "related list" 23 times:

Channel: Katy Perry Positions: 16, 17, 5, 6, 6, 17, 8, 8, 10, 18, 9, 4, 10, 8, 9, 10, 16, 13, 12, 6, 7, 10, 12, 10, 16, 19, 1, 16, 7, 4 Video: Katy Perry - Dark Horse (Official) ft. Juicy J by Katy Perry 5 years ago □

Channel: LMFAO Positions: 6, 5, 2, 1, 1, 5, 1, 1, 14, 1, 1, 4, 11, 11, 9, 9, 7, 1, 1, 16, 10, 6, 1, 7, 12, 6, 1, 16, 13, 1, 7, 6 Video: LMFAO - Sexy and I Know It (Official Video) by LMFAO 7 years ago □

Channel: officialpsy Positions: 1, 1, 7, 17, 1, 18, 1, 19, 16, 1, 15, 15, 6, 1, 1, 1, 1, 12, 19, 1, 1, 14, 14, 6, 1, 1, 15, 1, 15, 1, 1 Video: PSY - GENTLEMAN M/V by officialpsy 6 years ago □

Videos present among the "related list" 31 times:

Channel: Michael Jackson Positions: 12, 14, 15, 3, 3, 14, 3, 5, 3, 3, 14, 9, 9, 8, 8, 5, 14, 4, 6, 8, 7, 15, 5, 13, 8, 14, 3, 14, 11, 14 Video: Michael Jackson - Thriller (Official Music Video) by Michael Jackson □

Videos present among the "related list" 30 times:

Channel: LMFAO Positions: 9, 8, 10, 10, 11, 6, 10, 13, 10, 11, 6, 12, 11, 19, 12, 17, 17, 12, 10, 13, 18, 12, 19, 16, 12, 19, 9, 17, 12 Video: LMFAO ft. Lauren Bennett, GoonRock - Party Rock Anthem (Official Video) by LMFAO 8 years ago □

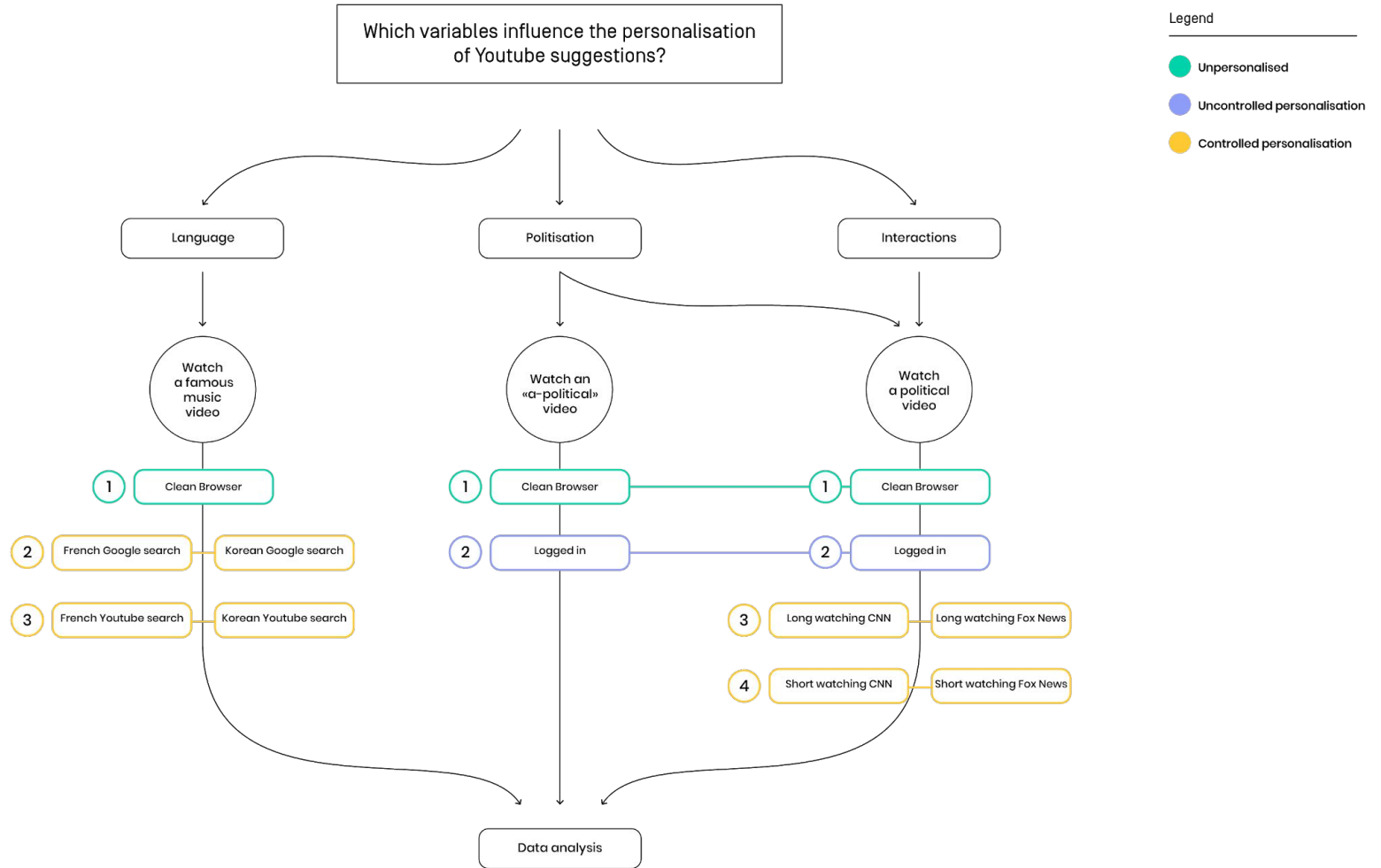
Videos present among the "related list" 29 times:

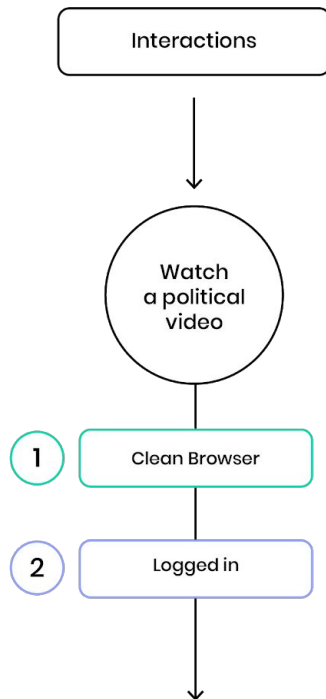
Channel: Luis Fonsi Positions: 14, 16, 6, 16, 15, 16, 16, 11, 14, 16, 17, 17, 15, 12, 14, 10, 18, 9, 17, 17, 17, 19, 16, 17, 17, 2, 4, 4, 5 Video: Luis Fonsi - Despacito ft. Daddy Yankee by Luis Fonsi 2 years ago □

Channel: Katy Perry Positions: 5, 4, 16, 9, 7, 4, 5, 11, 15, 4, 4, 13, 11, 18, 5, 17, 12, 16, 19, 17, 6, 16, 18, 4, 6, 12, 9, 11 Video: Katy Perry - Hot N Cold (Official) by Katy Perry 10 years ago □

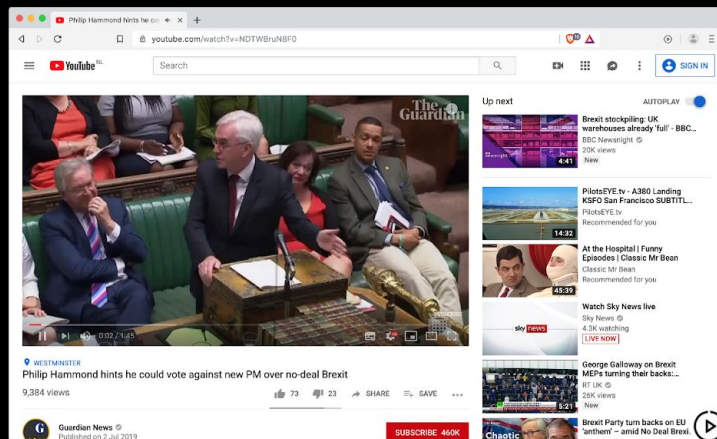
Channel: Ed Sheeran Positions: 2, 2, 1, 11, 12, 2, 14, 2, 11, 10, 5, 17, 18, 18, 19, 3, 18, 19, 16, 10, 11, 9, 19, 2, 13, 5, 17, 2, 19 Video: Ed Sheeran - Shape of You [Official Video] by Ed Sheeran 2 years ago □

Videos present among the "related list" 26 times:



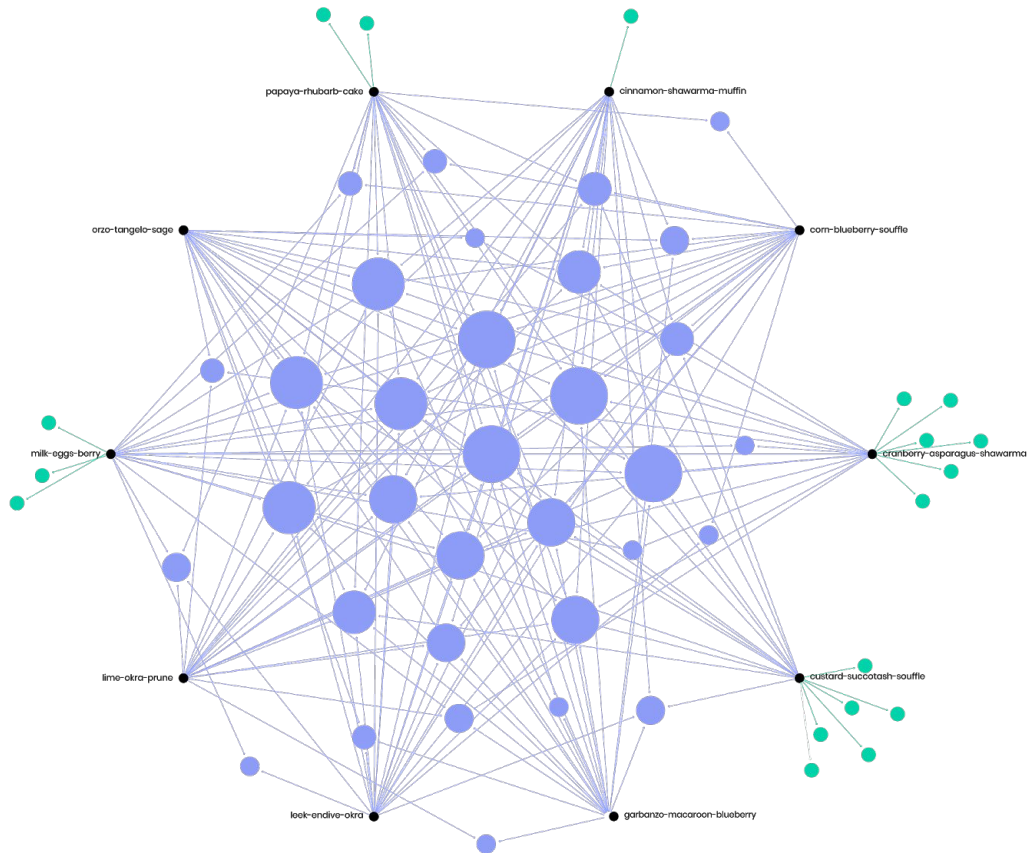


Personalized vs clean



Philip Hammond - no-deal Brexit

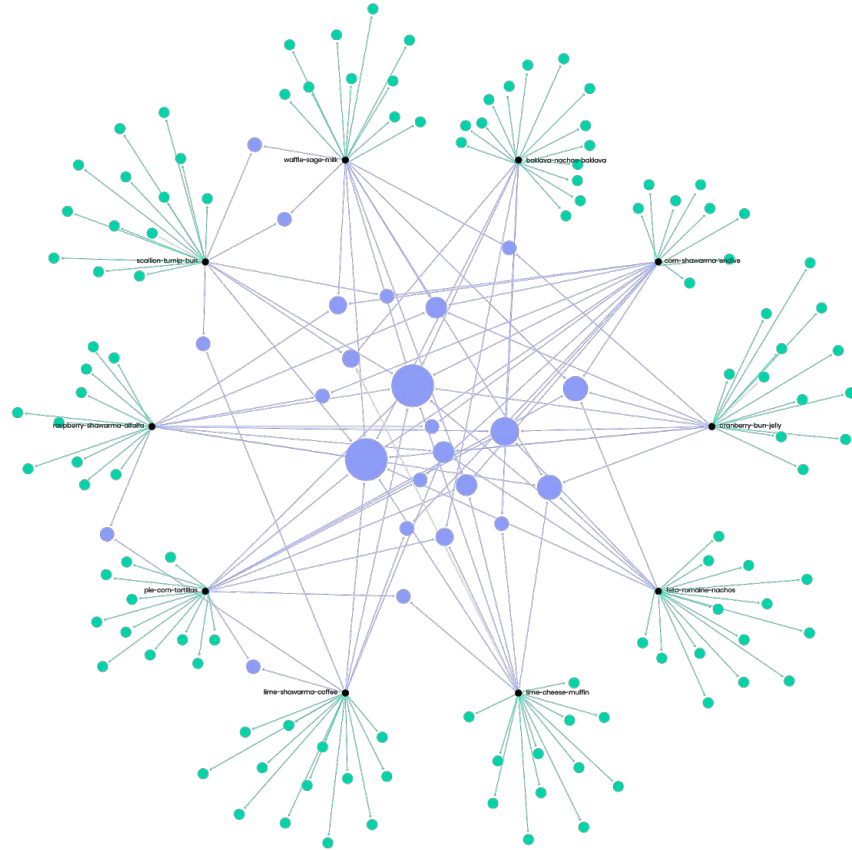
Watching a political video with a clean browser



Legend

- Suggested only to one
- Suggested to more than one
- Number of occurrences
- User

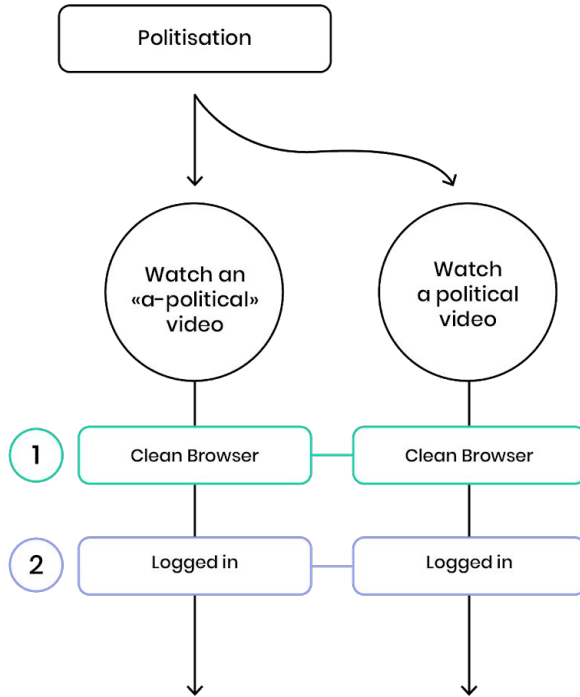
Watching a political video
with our personal Youtube account



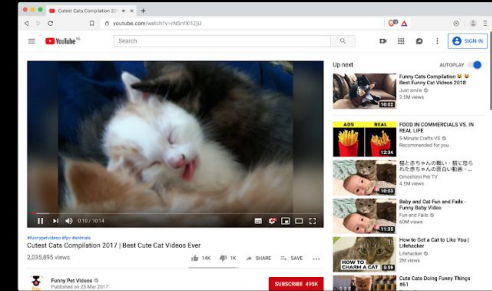
Legend

- Suggested only to one
- Suggested to more than one
- Number of occurrences
- User

Politics vs entertainment



Philip Hammond - no-deal Brexit

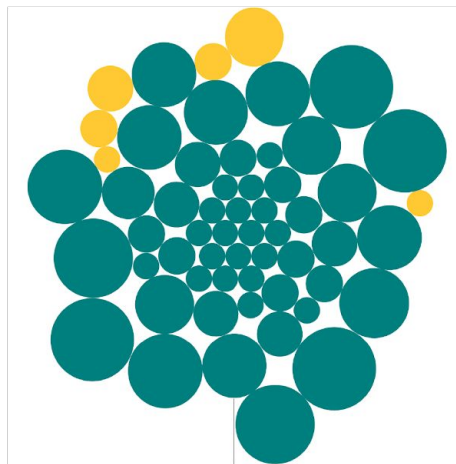


Cutest Cats Compilation 2017



Cutest Cats Compilation 2017

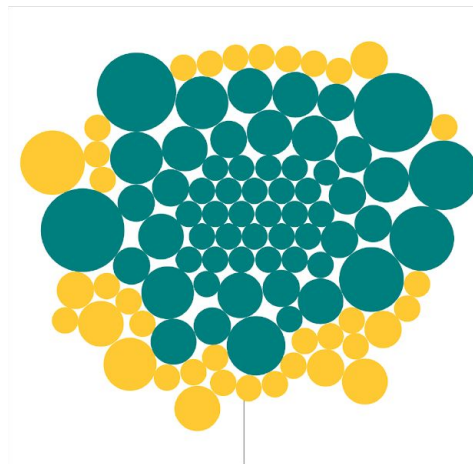
Watching an «a-political» video on a clean browser
or with our personal Youtube account



93%

7%

Clean browser



72%

28%

Youtube account

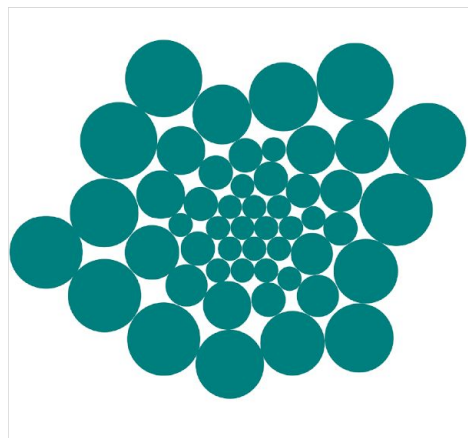
Legend

- Yellow circle: "Recommended for you"
- Teal circle: Suggested to all the users
- Circle size: Number of occurrences

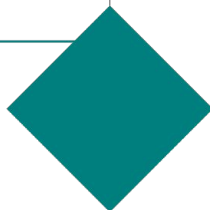


Philip Hammond - no-deal Brexit

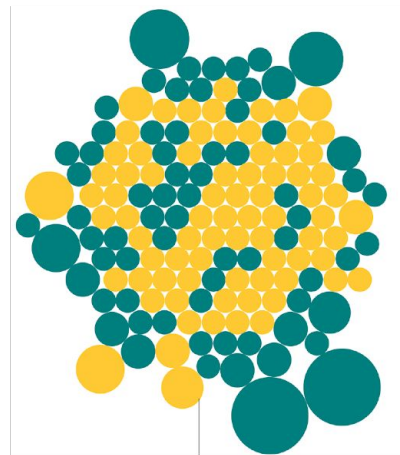
Watching a political video on a clean browser
or with our personal Youtube account



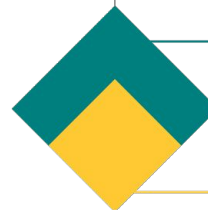
100%



Clean browser



55%



45%

Youtube account

Legend

- "Recommended for you"
- Suggested to all the users
- Number of occurrences

Language



Watch
a famous
music
video



1

Clean Browser



2

French Google search

Korean Google search



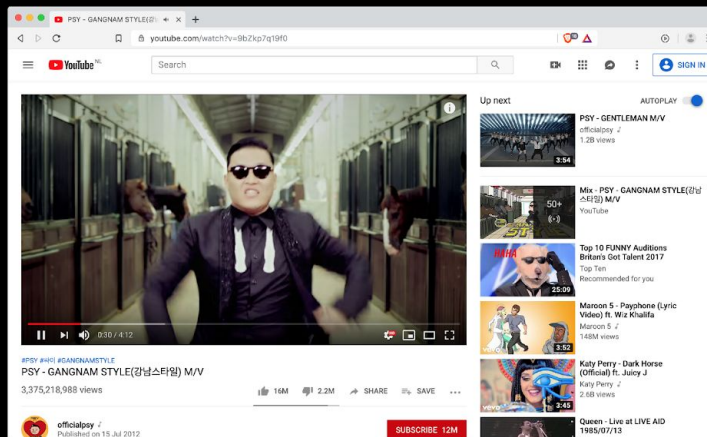
3

French Youtube search

Korean Youtube search



Language and localization



PSY - GANGNAM STYLE



과학적으로 입증된 빠르게 살빼는 방법 TOP9 - YouTube

<https://www.youtube.com/watch?v=tkzkrFe0PEE> ▼ Vertaal deze pagina

21 nov. 2017 - 과학적으로 입증된 빠르게 살빼는 방법 TOP9. Ms테리. Loading... Unsubscribe from Ms테리? Cancel Unsubscribe. Working.

운동 안하고 쉽게 살빼는 방법 알려드릴게요! - YouTube

<https://www.youtube.com/watch?v=9QIIYo3rXDK> ▼ Vertaal deze pagina

3 jun. 2016 - 운동 안하고 쉽게 살빼는 방법이 있다면 모든 분들이 쉽게 다이어트 할 수 있겠죠. 그 방법을 맑은참피부와 비만센터 '참슬림바디체형센터'에서 알려 ...

[다이어트 교실] 살빼는 방법 최초공개!! 8시간만에 6kg 체중감량 실화 ...

<https://www.youtube.com/watch?v=vJCHh3uY-hs> ▼ Vertaal deze pagina

20 dec. 2017 - 운동선수 출신의 스냅백이 알려주는 살빼는 방법 과연 8시간만에 살을 얼마나 뺄 수 있을까? [여러분들의 모든 궁금증을 해결해드리겠습니다.]

운동 없이 살빼는 방법 12가지 - WIKITREE

<https://www.wikitree.co.kr/190741> ▼ Vertaal deze pagina

명품 브랜드 샵의 디자이너 칼 라거펠트는 디올옴므의 수트를 입기 위해 18개월 동안 무려 42kg를 감량했다. 그가 다이어트를 하는 동안 아침에 일어나자마자 한 ...

빨리 살빼는 방법: 과학에 근거한 3가지 단계 :: 블로그

<https://tongui.tistory.com/48> ▼ Vertaal deze pagina

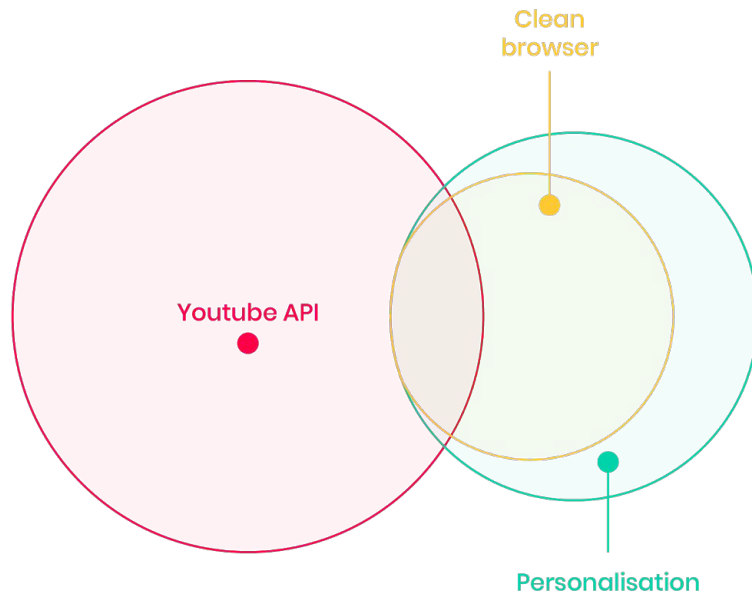
24 jun. 2016 - 빨리 살빼는 방법: 과학에 근거한 3가지 단계 살을 많이 빼는 방법은 여러가지가 있습니다. 그런데 그 중 많은 방법은 배고픔에 허덕이게 만들거나 ...

단기간 살빼는법 -17kg 감량후기 : 네이버 포스트

<https://m.post.naver.com/viewer/postView.nhn?volumeNo...> ▼ Vertaal deze pagina

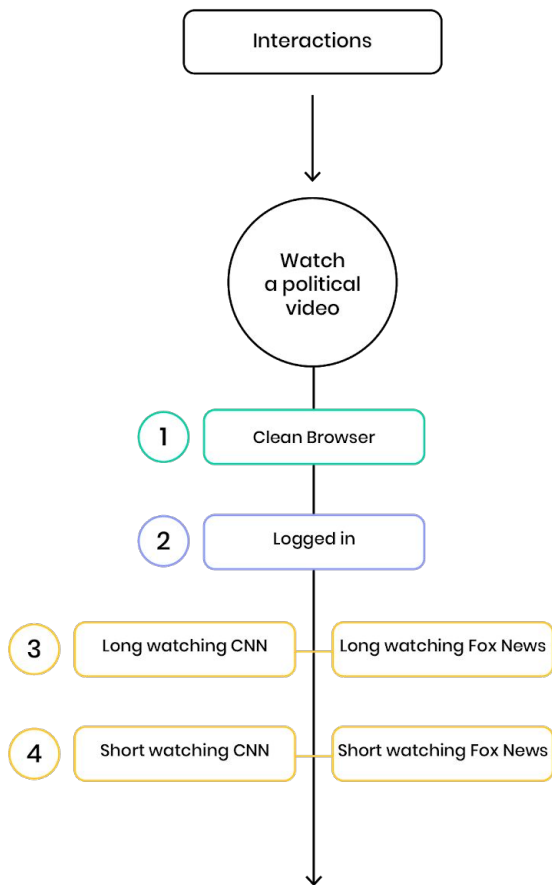
26 sep. 2017 - 그래서 제가 선택한 방법이 식단 조절 하면서 살을 빼는 방법! 이 방법으로 살을 빼니까 진짜 방법도 너무 간편했고 살빼는동안 크게 힘든점 없이 ...

API vs actual recommendation

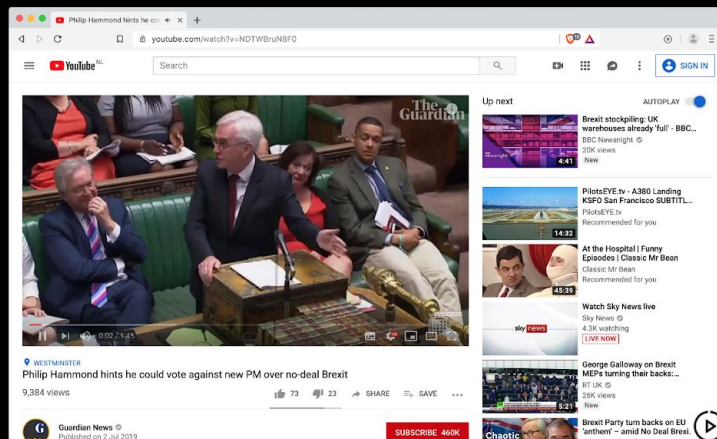


Legend

○ Number of occurrences

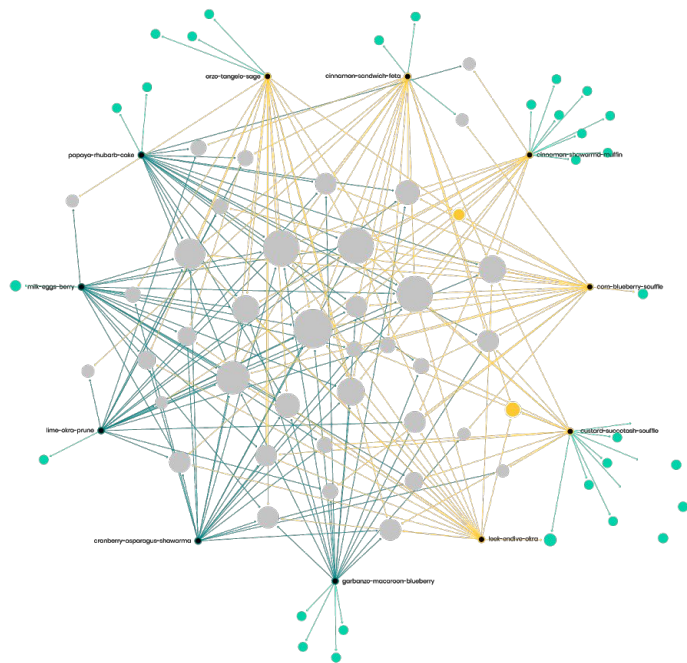


Every second matters

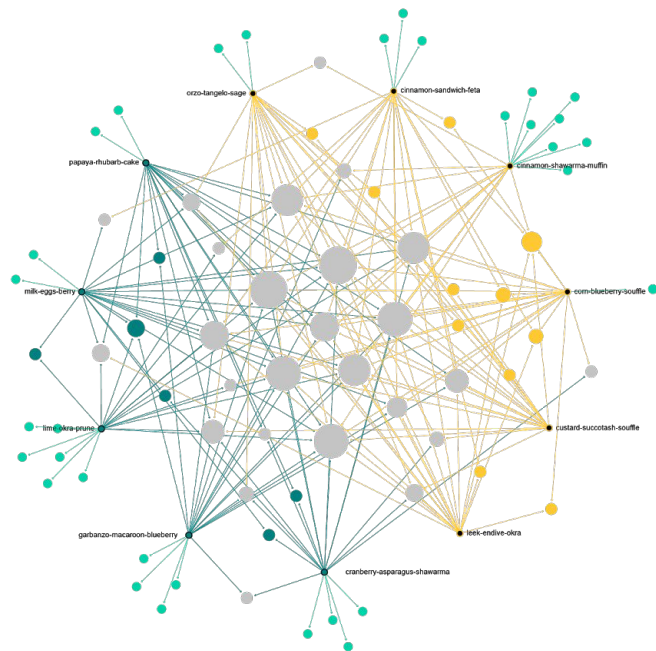


Philip Hammond - no-deal Brexit

Watch a political video
after watching short political content

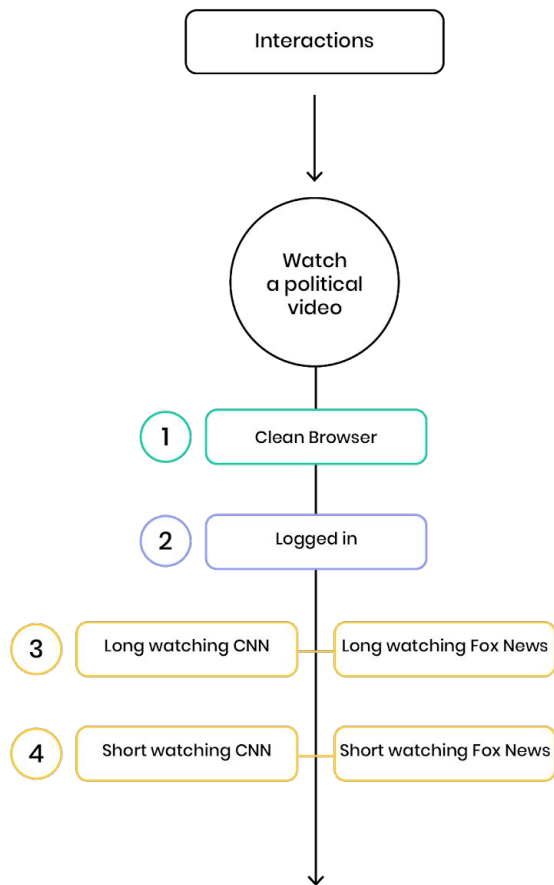


Watch a political video
after watching long political content

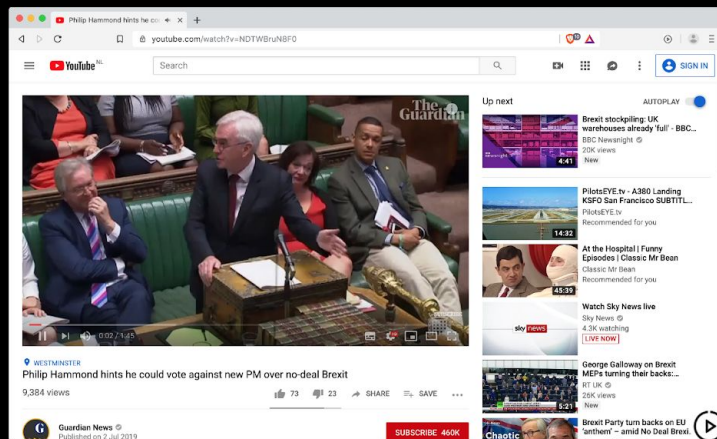


Legend

- Suggested only to one
- Suggested to both CNN and Fox News watchers
- Suggested to CNN watchers
- Suggested to Fox News watchers
- Watchers of CNN video
- Watchers of Fox News video
- Number of occurrences
- User



Every trace matters



Philip Hammond - no-deal Brexit

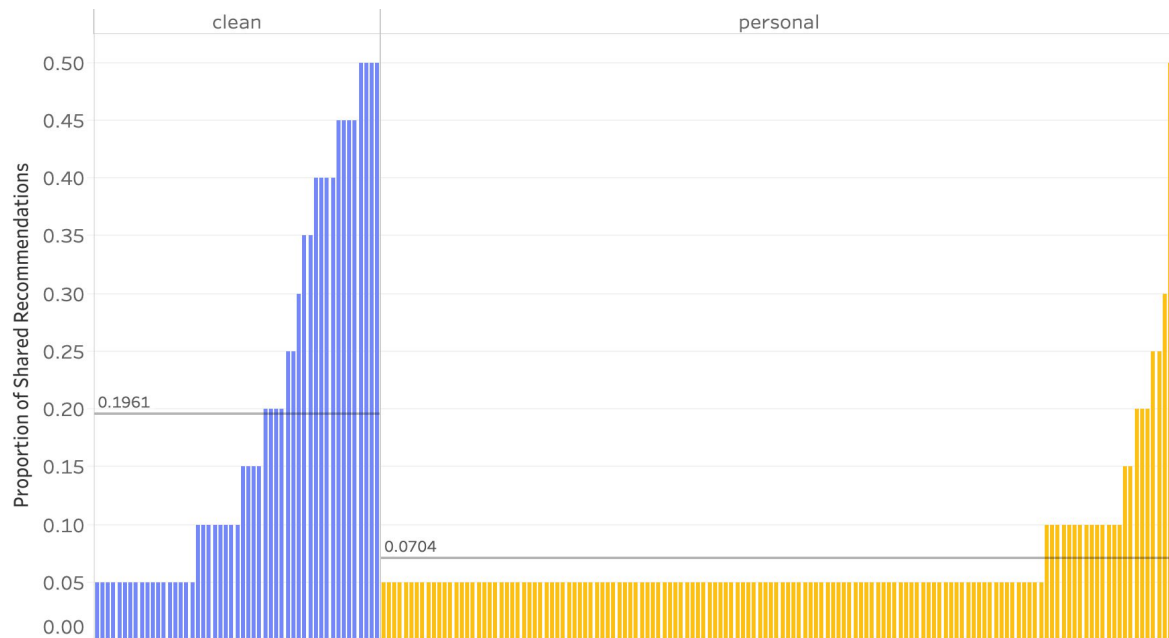
Clean vs. Personal: Testing difference in means

Legend

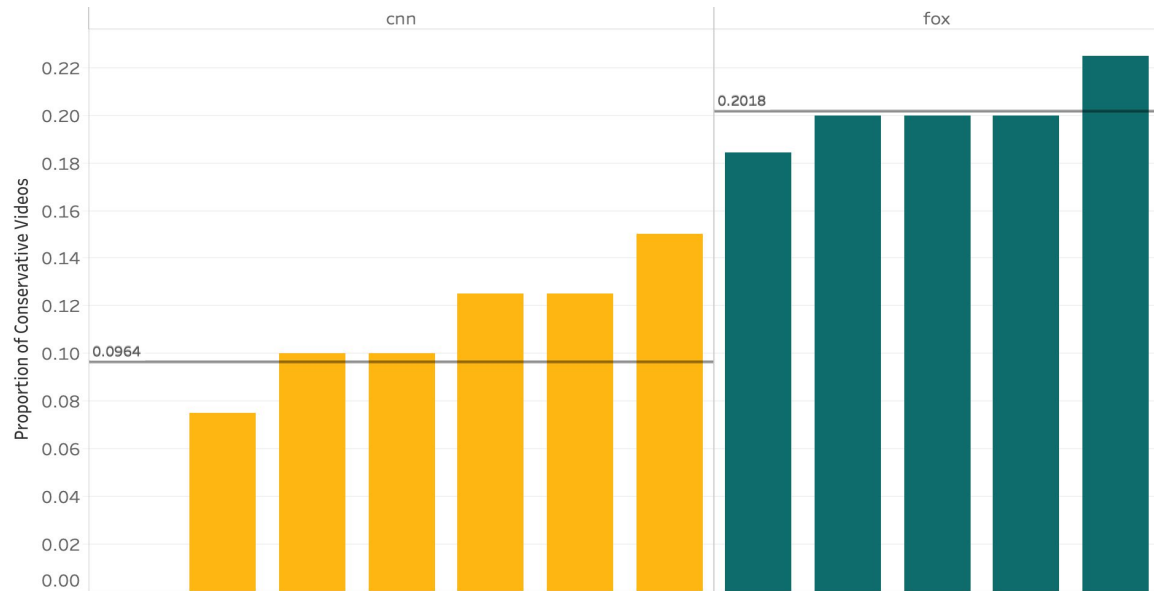
- Clean browser
- Both watchers of CNN and Fox News

Conclusion

Clean browser
→ Less personalized



Fox vs. CNN: Proportions of Conservative Sources



Legend

- Fox News watchers
- CNN video watchers

Conclusion

Watching Fox video
→ More conservative
sources recommended

2018

“The basic structure of YouTube’s recommendation algorithm might’ve worked **fine for its core types of content** — like cat videos, gaming, and music. But as **YouTube becomes more central in people’s information and news consumption**, Chaslot worries recommendations will **push people further to extremes** — whether they want it or not — just because it’s in YouTube’s interest to keep us watching for as long as possible.”

2019



Official Blog

Giving you more control over your Homepage and Up Next videos

Wednesday, June 26, 2019

Articles

<https://www.wired.com/story/youtube-video-recommendations-changes/> (26th June 2019)

<https://www.wired.com/story/youtube-recommendations-crackdown-borderline-content/> (25th January 2019)

<https://www.nytimes.com/2018/03/10/opinion/sunday/youtube-politics-radical.html> (Tufekci 2018)

<https://www.nytimes.com/2019/06/14/opinion/youtube-algorithm.html> (14th June 2019)

<https://journals.sagepub.com/doi/full/10.1177/1354856517736982> (Rieder, Matamoros-Fernández & Coromina, 2018)

<https://static.googleusercontent.com/media/research.google.com/en//pubs/archive/45530.pdf> (Covington, Adams and Sagrin, 2016)

<https://www.nytimes.com/interactive/2019/06/08/technology/youtube-radical.html> (Rose, 2019)

<https://thenextweb.com/google/2019/06/14/youtube-recommendations-toxic-algorithm-google-ai/> (Maack, 2019)