



Web communities network mapping with Hyphe

Benjamin Ooghe-Tabanou

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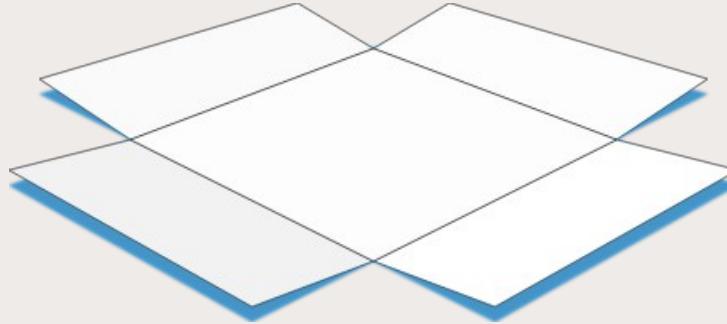
Submitted on 16 Dec 2022

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Web communities network mapping with Hyphe

NodeXL Academy '22
January 19th 2022

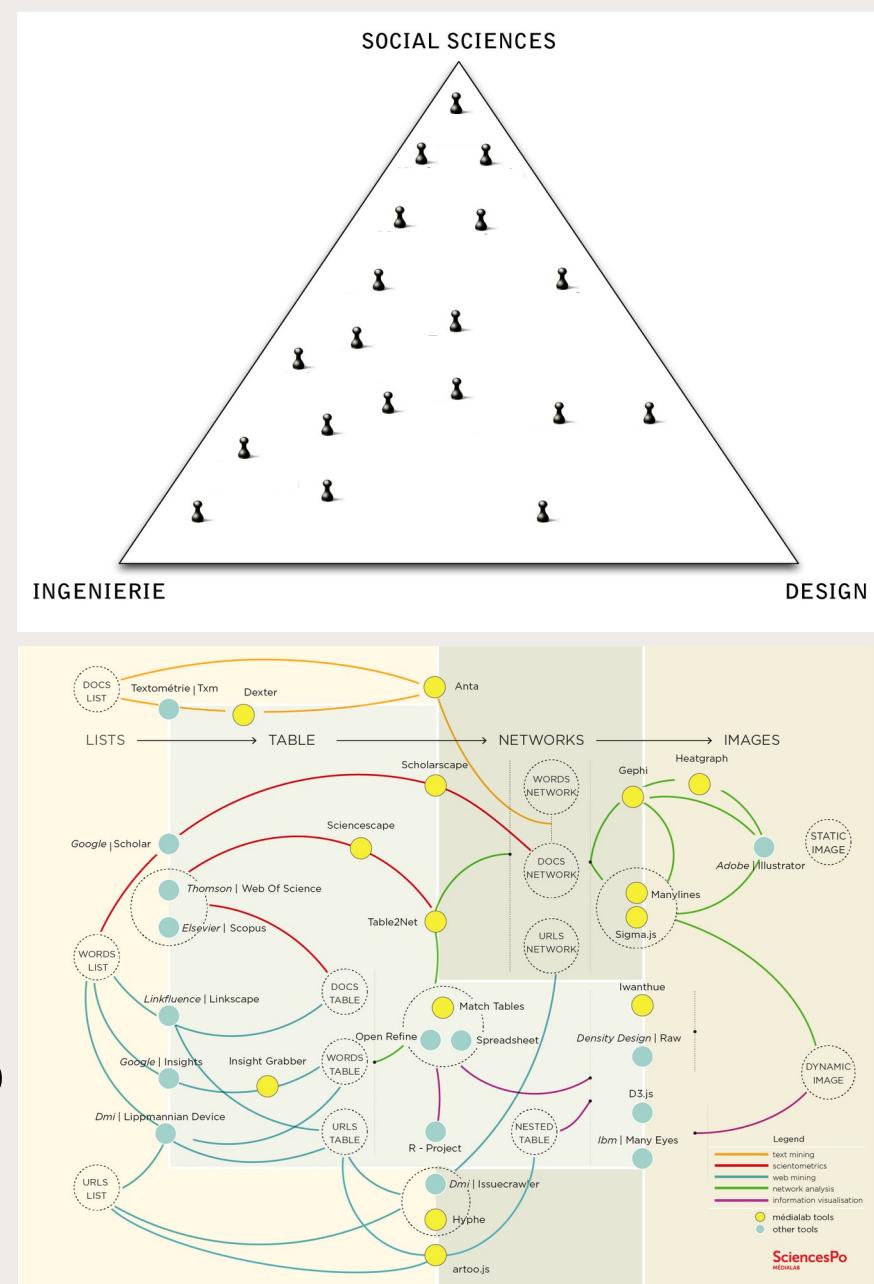
Benjamin Ooghe-Tabanou (@boogheTA)
Sciences Po médialab (@medialab_ScPo)

SciencesPo
MÉDIALAB

médialab @ Sciences Po

<https://medialab.sciencespo.fr>

- Pluridisciplinary Research Lab created by Bruno Latour in May 2009, led by Dominique Cardon since 2017
- Social Sciences, Engineering & Design
- Articulate qualitative & quantitative methods through a digital approach
- Work with digital traces
- Deploy an ecosystem of tools
<http://tools.medialab.sciences-po.fr>
- METAT: a monthly Open Support Workshop
<https://www.sciencespo.fr/recherche/fr/content/metat-latelier-de-methodes>



Bruno Latour, médialab founder



*« Google is nice,
but we need
something better »*

The Indian Express, 2011

Webcrawlers? What is that?

« Web crawling is the process of building a collection of webpages by starting with an initial set of URLs and recursively traversing the corresponding pages to find additional links. »

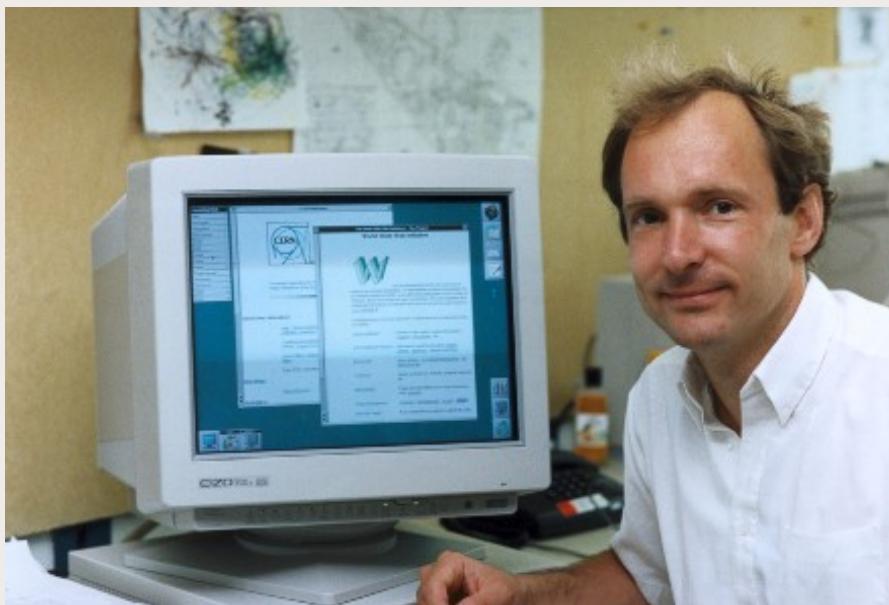
Gabe Ignatow & Rada Mihalcea, in: Text Mining: A Guidebook for the Social Sciences

But why would anyone want to do that?

- create an index for a search engine (like... you know...)
- extract contents or structured data (like scraping)
- perform some text mining
- study network communities through hyperlinks

Crawling the web for social sciences?

« **Hyperlink** » is at the core of the Web's architecture
→ charged with meaning and structure



« *The texts are **linked together** in a way that one can go from one concept to another to find the information one wants.*

*The network of links is called a **web**. [...]*

*The texts are known as **nodes**.*

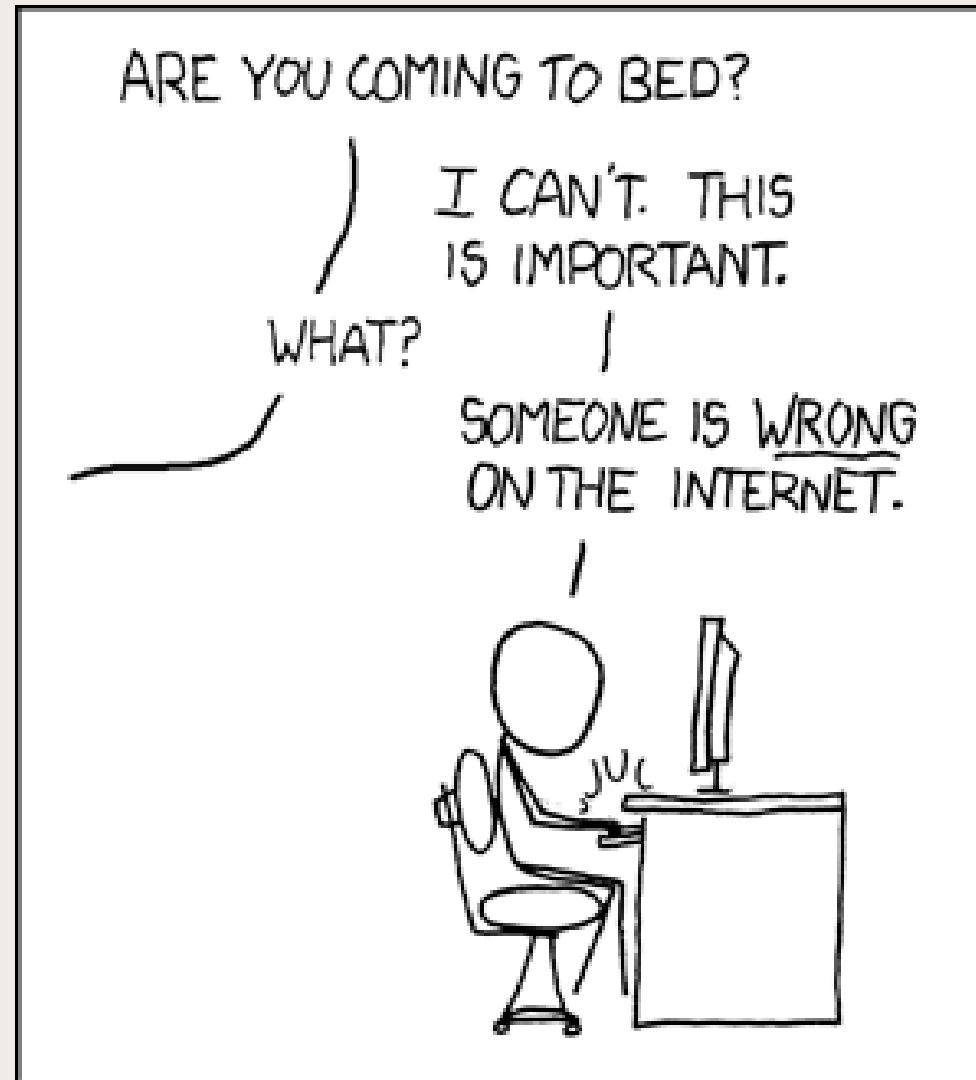
*The process of proceeding from node to node is called **navigation**. »*

Tim Berners-Lee, 1990, [WorldWideWeb: Proposal for a HyperText Project](#)

« *A hyperlink is a **manifestation of intention**. By linking one page to another, one piece of text to another, people intend to do particular things.* »

Ryfe, Mensing, & Kelley, 2016, [What is the meaning of a news link?](#)

The Web: a place of controversies and debates

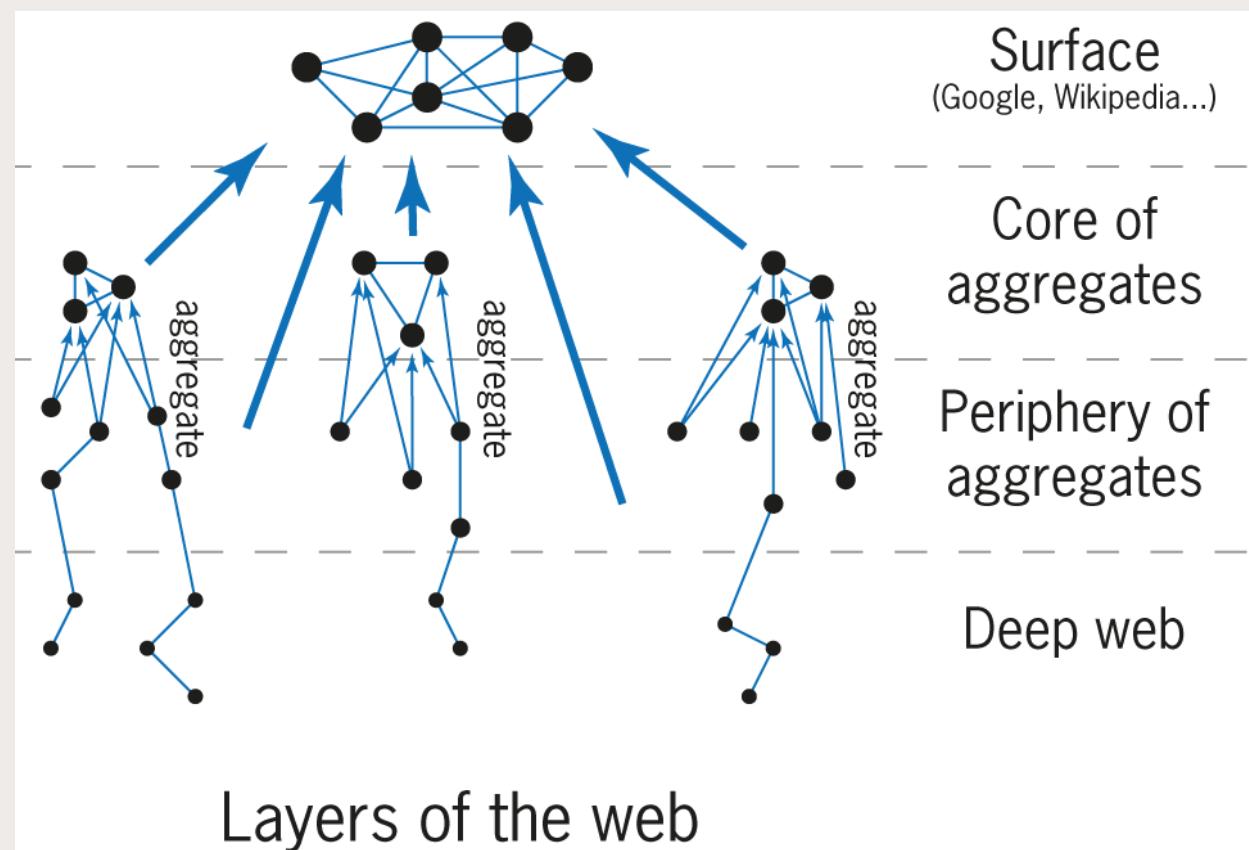


CC-BY-NC - Randall Munroe - XKCD

A bottom-up hierarchy emerged from hyperlinks

« Matthew effect » : preferential attachment

→ new web pages tend to cite the already most cited ones



Hyphe: a research directed crawler

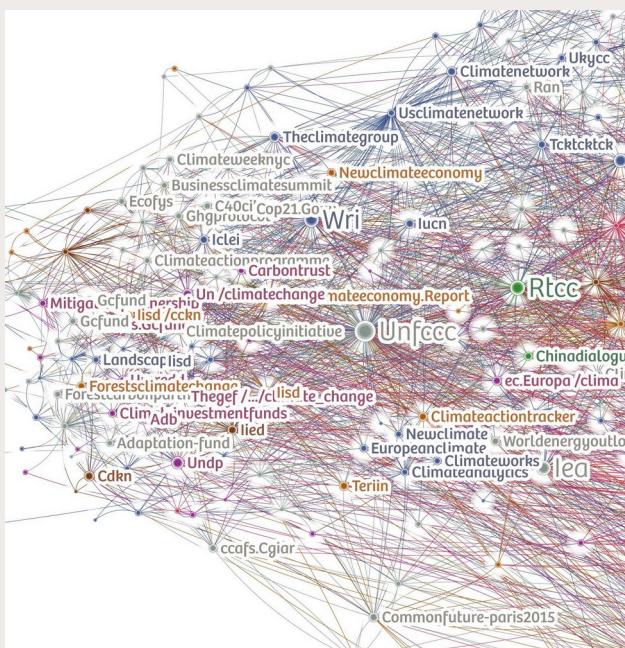
<http://hyphe.medialab.sciences-po.fr/demo/>

Build your own web documents corpus
to study social phenomena online

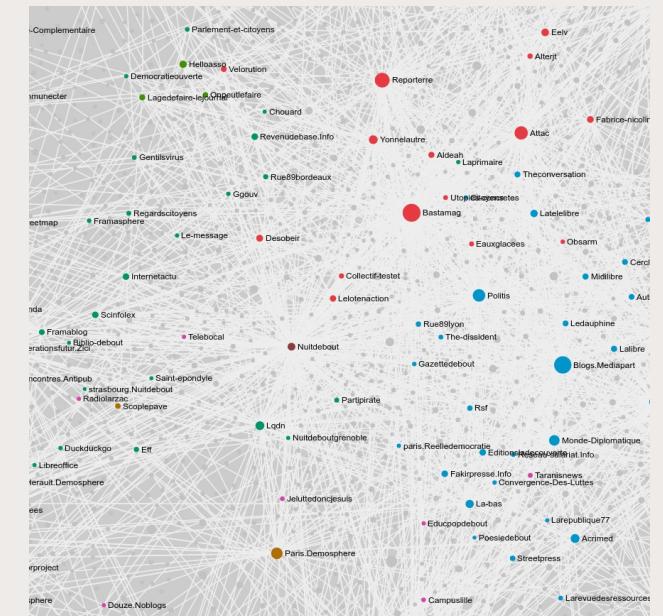
- gather « web actors »
- explore hyperlinks between them



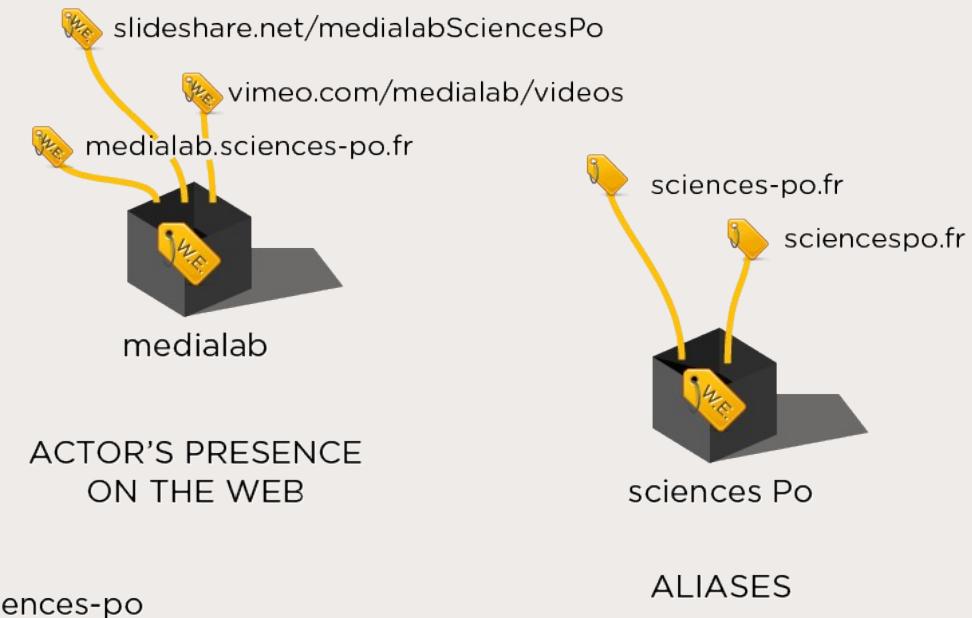
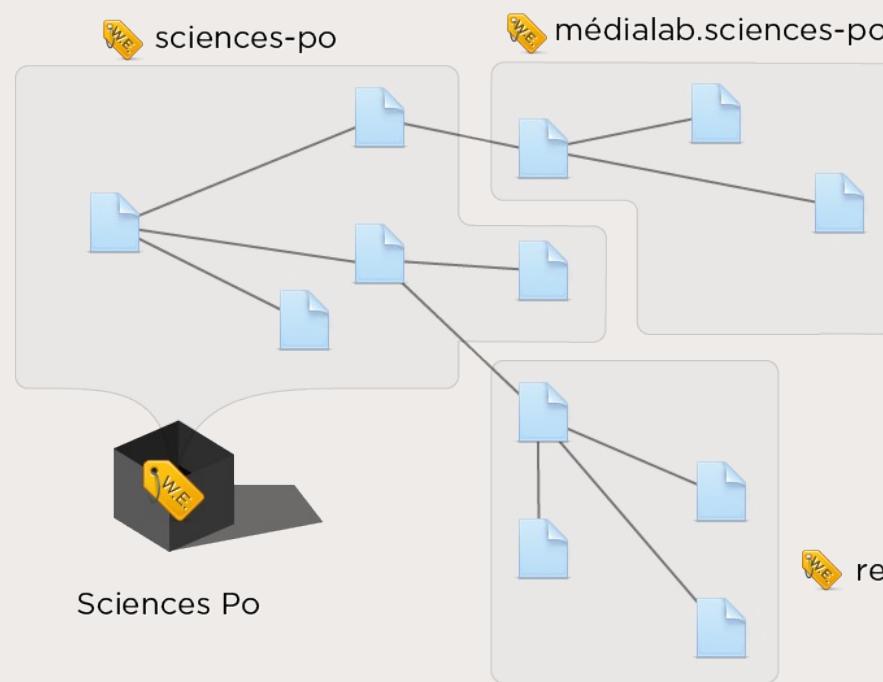
hyphe



COP 21
Vie privée
Extrême droite
Tissu associatif
Produits laitiers
Cellules souches
Administrations culturelles
...

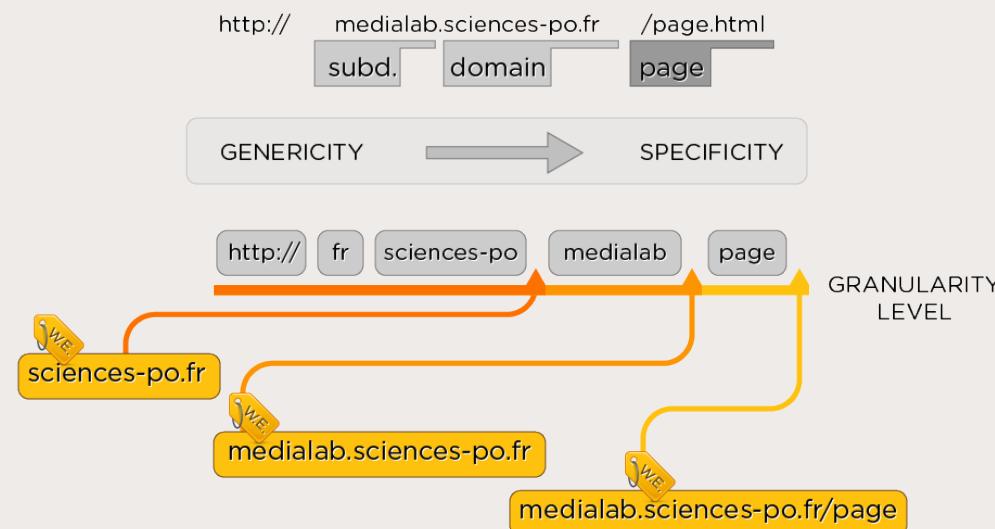


There is no such thing as a « website » !



→ « **WebEntities** » : bundles of webpages aggregating coherent actors to answer a specific research question
= set of URL prefixes

Finely delimit the web territories of actors



Manually setup prefix patterns to adjust the cursor of « WebEntities »

DEFINE WEB ENTITIES
Check the boundaries of each web entity before creating it

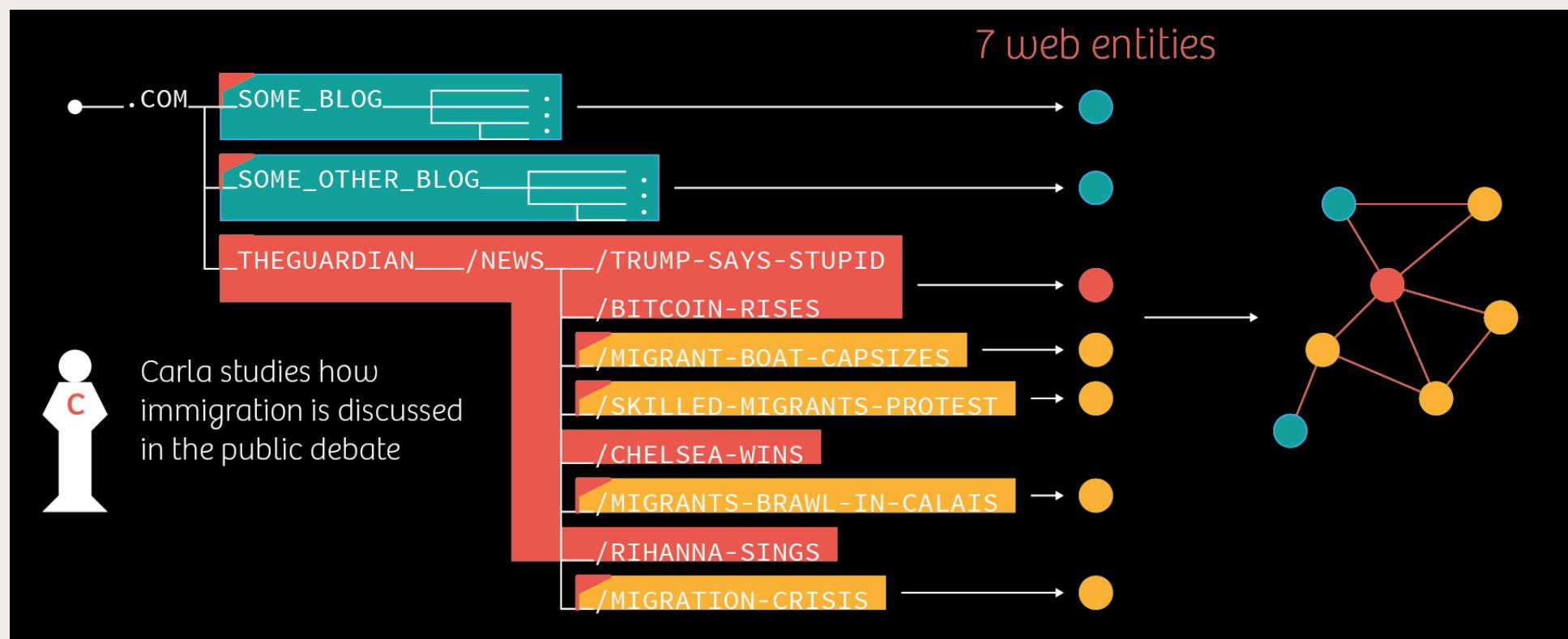
Move all sliders TO THE LEFT TO THE RIGHT

1	medialab.Science-Po.fr	http .fr sciences-po medialab.
2	tools.medialab.Science-Po.fr	http .fr sciences-po medialab. tools.
3	Sciences-Po.fr	https .fr sciences-po www.
4	Sciencespo.fr /bibliotheque	http .fr sciencespo www. /bibliotheque
5	Twitter.com /medialab_ScPo	https .com twitter /medialab_ScPo

Which data structure to manage hypertexts?

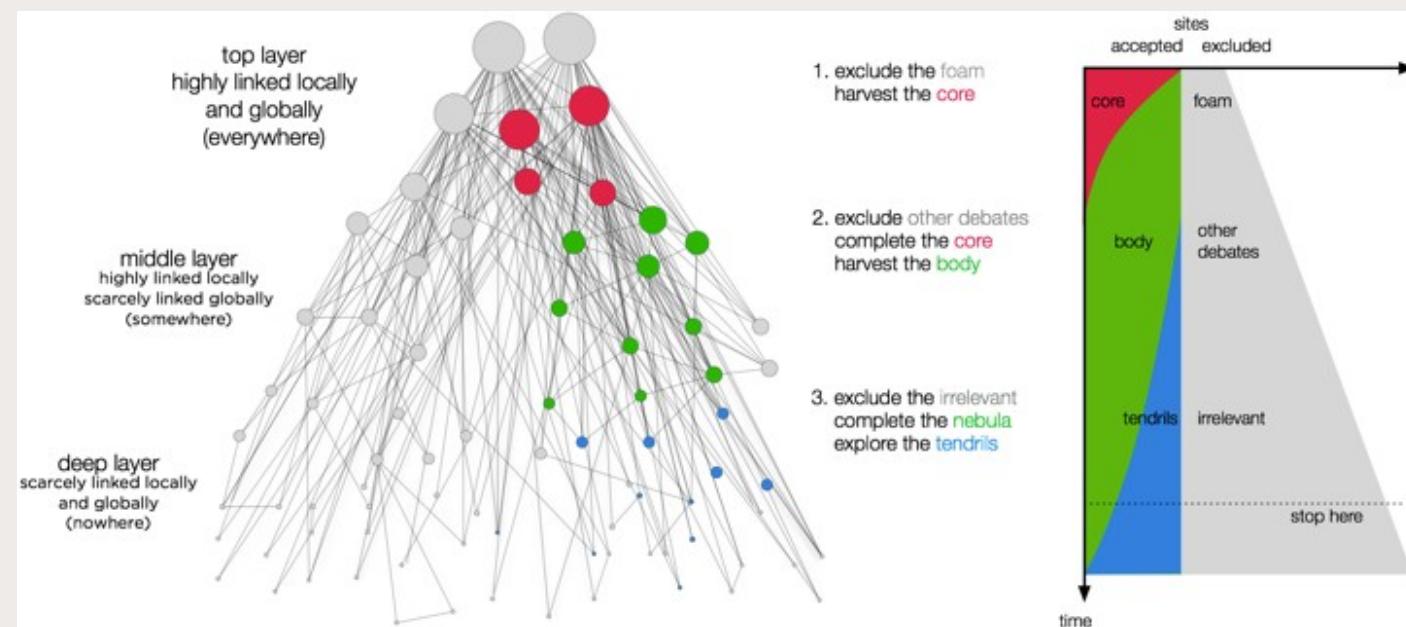
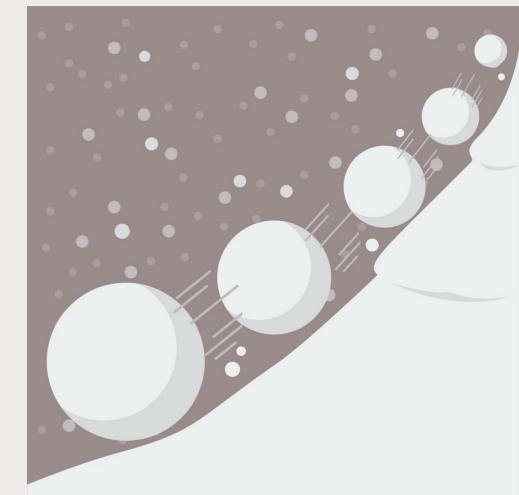
<https://medialab.github.io/hyphe-traph/fosdem2018/#/>

- Tree of urls
 - Graph of hyperlinks
 - Dynamic branches aggregates
- Hyphe's Traph



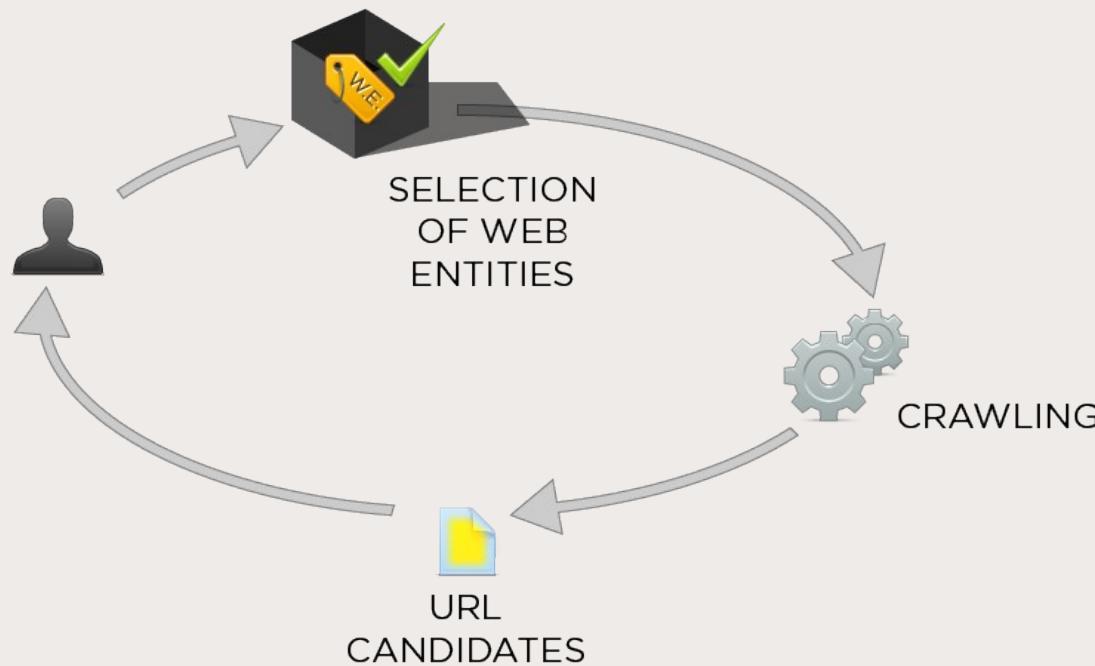
Hyphe's crawling strategy: leverage hyperlinks

- Classical crawlers (DMI's IssueCrawler): Snowball
 - Top Layer attraction (Google, YouTube, Wikipedia...)
 - Topic drifts
- Hyphe:
 - crawl exclusively pages within the chosen WebEntities
 - sort discovered entities by degree of citation
 - humanly select new entities to include and crawl

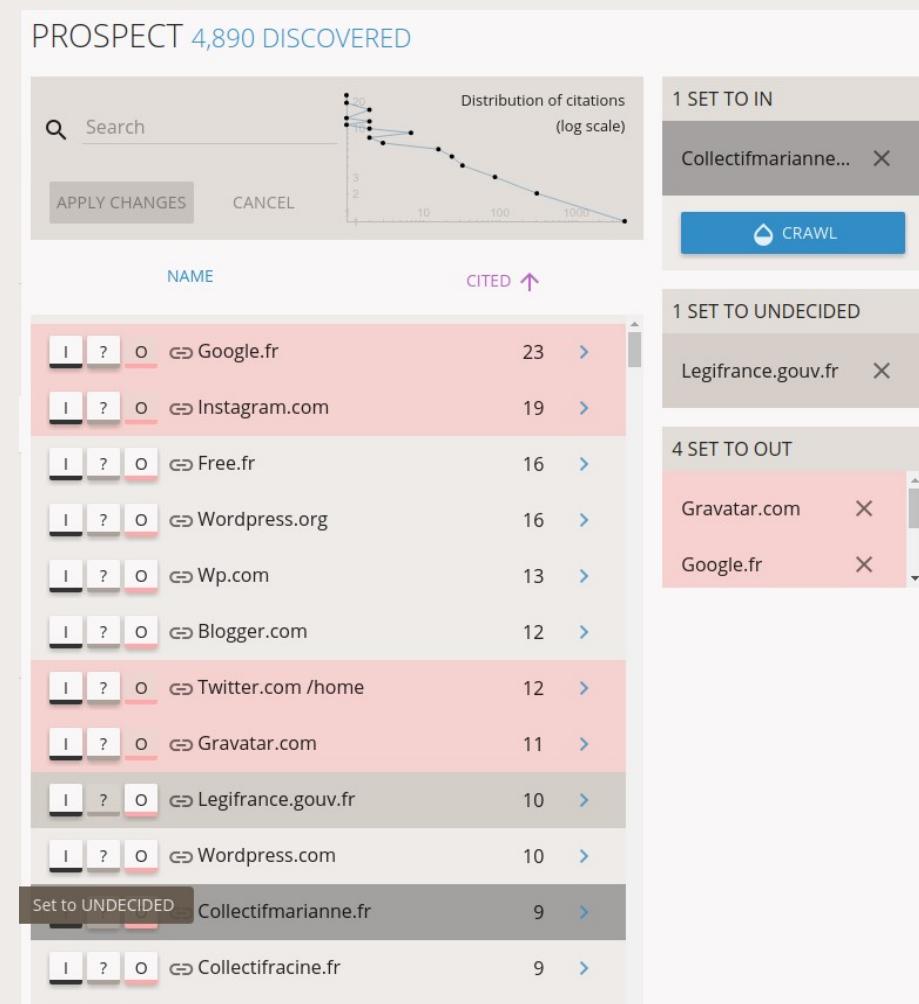


Web prospection loop: curating a corpus iteratively

- Step by step iterative expansion & curation of entities

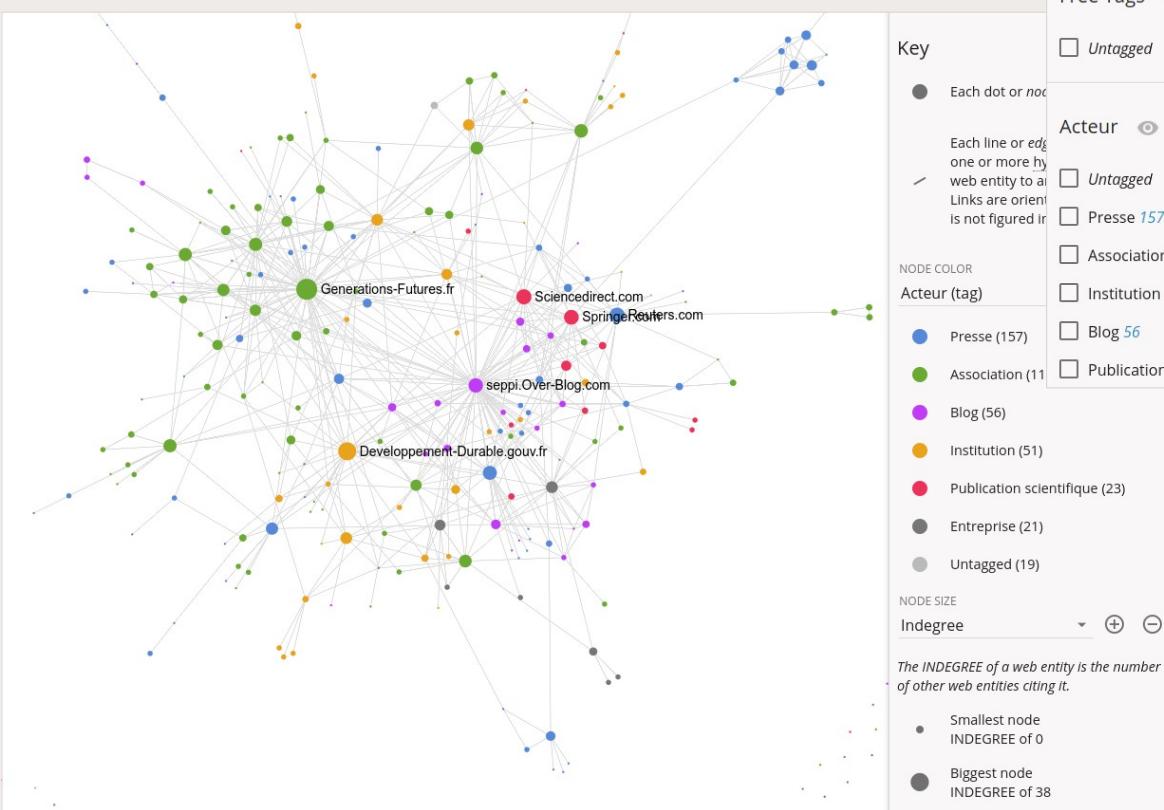


- Human/Time cost
- How to know when to stop?
→ hyperlink citations threshold



Qualify the corpus entities (tagging)

- Free notes
- Categories



TAGS
Filter web entities (status IN only). Tag one or a selection of web entities.

439 WEB ENTITIES

TAG FILTERS

Special filters

- Untagged
- Partially untagged
- Conflicts

Free Tags

- Untagged

Acteur

- Untagged
- Presse 157
- Association 11
- Institution 51
- Blog 56
- Publication scientifique 23

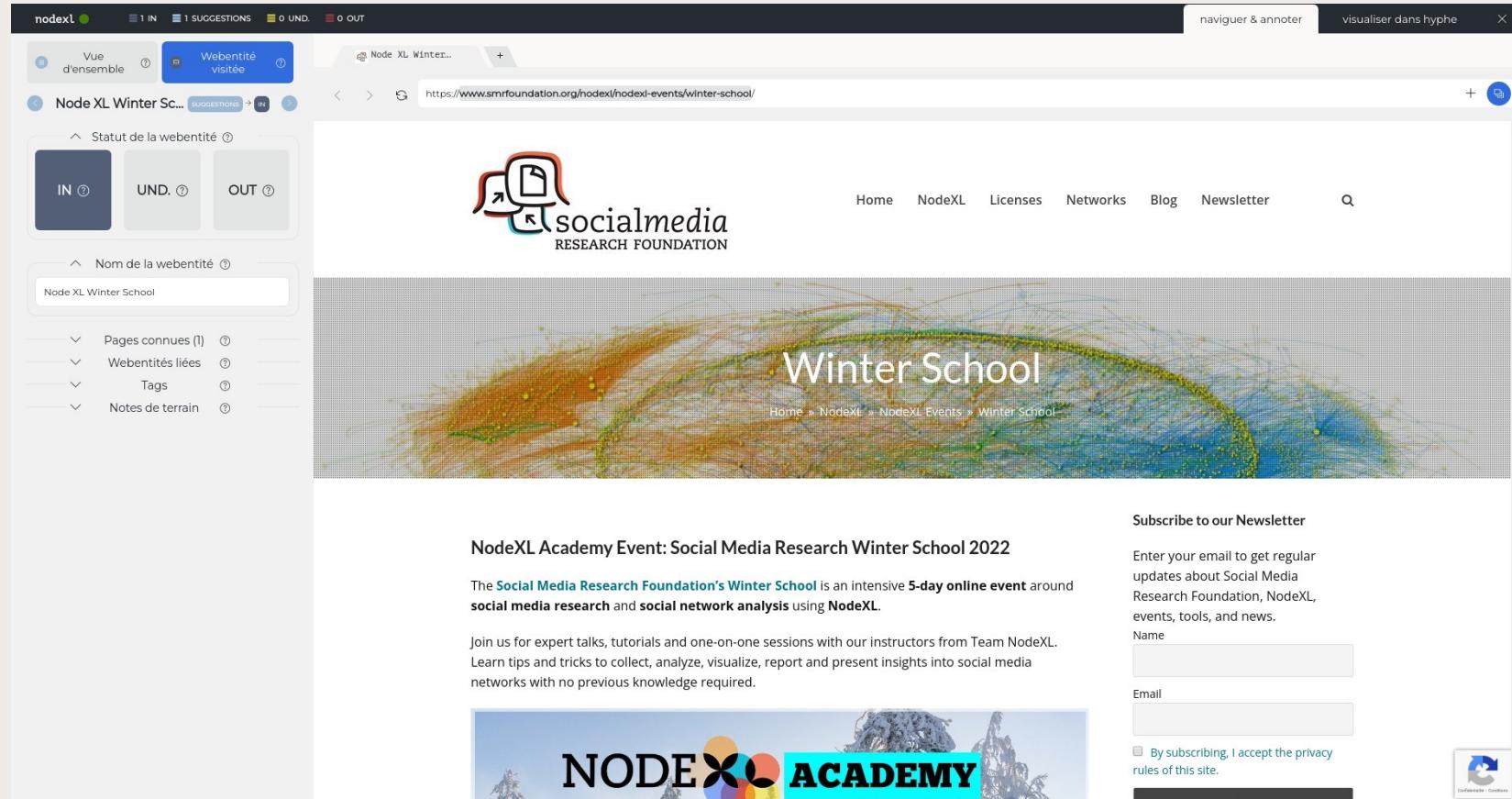
WEB ENTITIES NETWORK

Display a category Point de vue

Entity	Category	Point de vue
Futura-Sciences.com /.../biologie-pesticide-9169	Neutre	>
Lefigaro.fr /.../37002-20170627ARTFIG0002-pesticidepe-sti-sid-n-m...	Neutre	>
Parents.fr /.../pesticides-et-grossesse-des-risques-confi...	Contre les pesticides	>
formulaires.Fondation-Nicolas-Hulot.org /.../stop_pestic...	Contre les pesticides	>
Contrepoints.org /.../270496-pesticides-lintox-discours-bio	Pour les pesticides	>
Observatoire-Pesticides.gouv.fr	Neutre	>
Letemps.ch /.../toxicite-pesticides-tueurs-dabeilles-confirmee-terrain	Neutre	>
Sciencepresse.qc.ca /.../neonicotinoides-pesticides-tue...	Contre les pesticides	>
Notre-Planete.info /.../4613-liste-fruits-legumes-pesticides	Neutre	>
Lepoint.fr /.../pesticides-tueurs-d-abeilles-bayer-interpelle-par-un-mil...	Neutre	>
Consoglobe.com /abeilles-pesticides-bayer-cg	Contre les pesticides	>

HyBro: a web browser designed for corpus curation

<https://github.com/medialab/hyphe-browser/releases/>



« NaviCrawler » heritage : build a Hyphe web corpus while browsing

- « in-situ » prospection & tagging (digital field work)
- teach the web to students

Many ways to use Hyphe

- Complete methodology includes:
sourcing, automatized collection, iterative corpus building
qualitative categorization, exploratory analysis,
network visualization, quantitative statistical analysis
- Diverse audiences:
 - Research: help social scientists work on digital fields
 - Pedagogy: teach students what the web is beyond Google & Facebook
- Possible small & large scale analyses:
 - a website's internal structure
 - a theme's ensemble of actors and their ties
 - a controversy's alliances & oppositions
 - etc.

From above: clusters, opposition & affinity

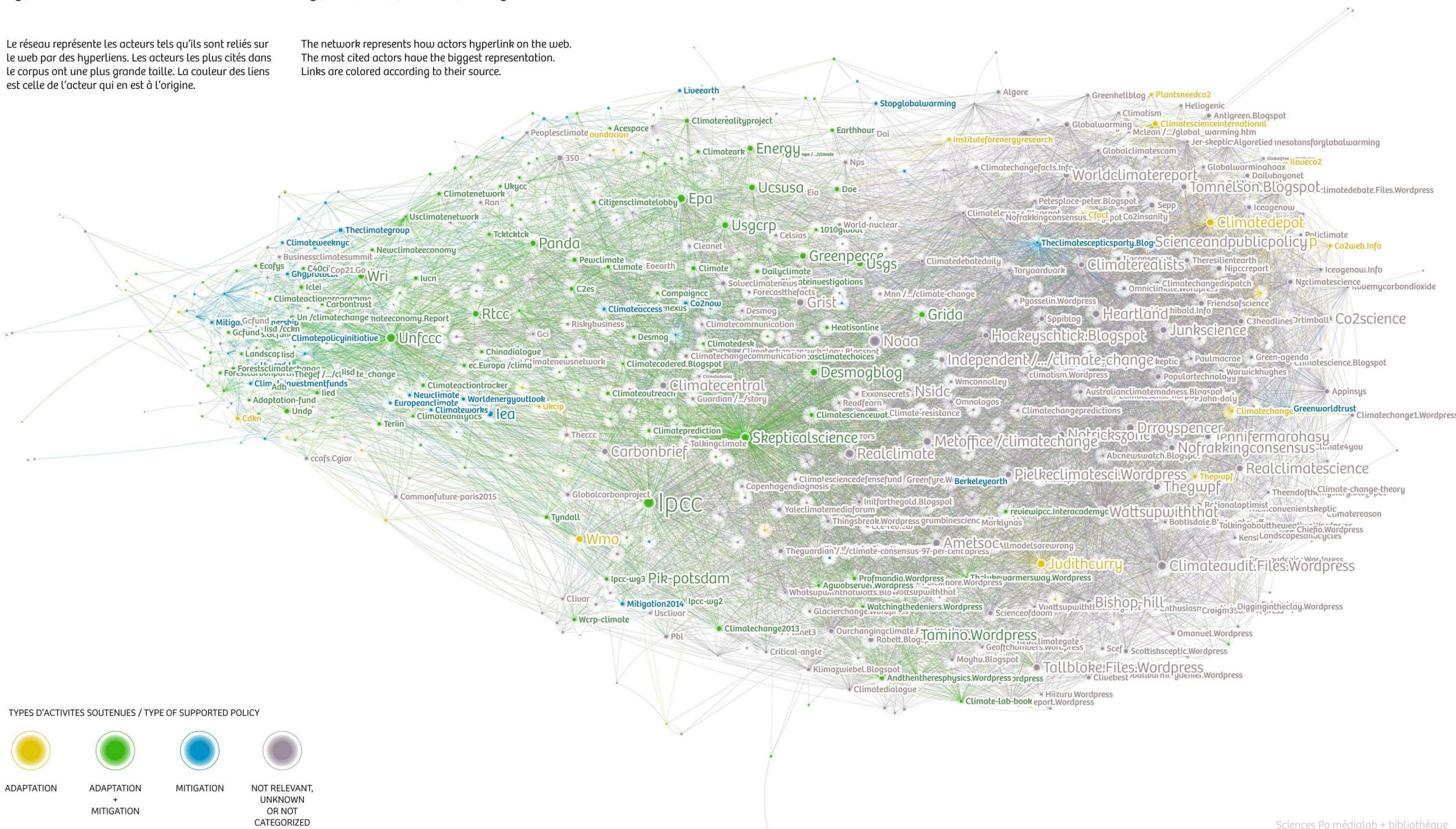
Corpus web sur le changement climatique : types d'activités soutenues

Le réseau représente les acteurs tels qu'ils sont reliés sur le web par des hyperliens. Les acteurs les plus cités dans le corpus ont une plus grande taille. La couleur des liens est celle de l'acteur qui en est à l'origine.

Web corpus on climate change: type of supported policy

The network represents how actors hyperlink on the web. The most cited actors have the biggest representation. Links are colored according to their source.

Double Dating Data: Climate change on the web



From above: clusters, opposition & affinity

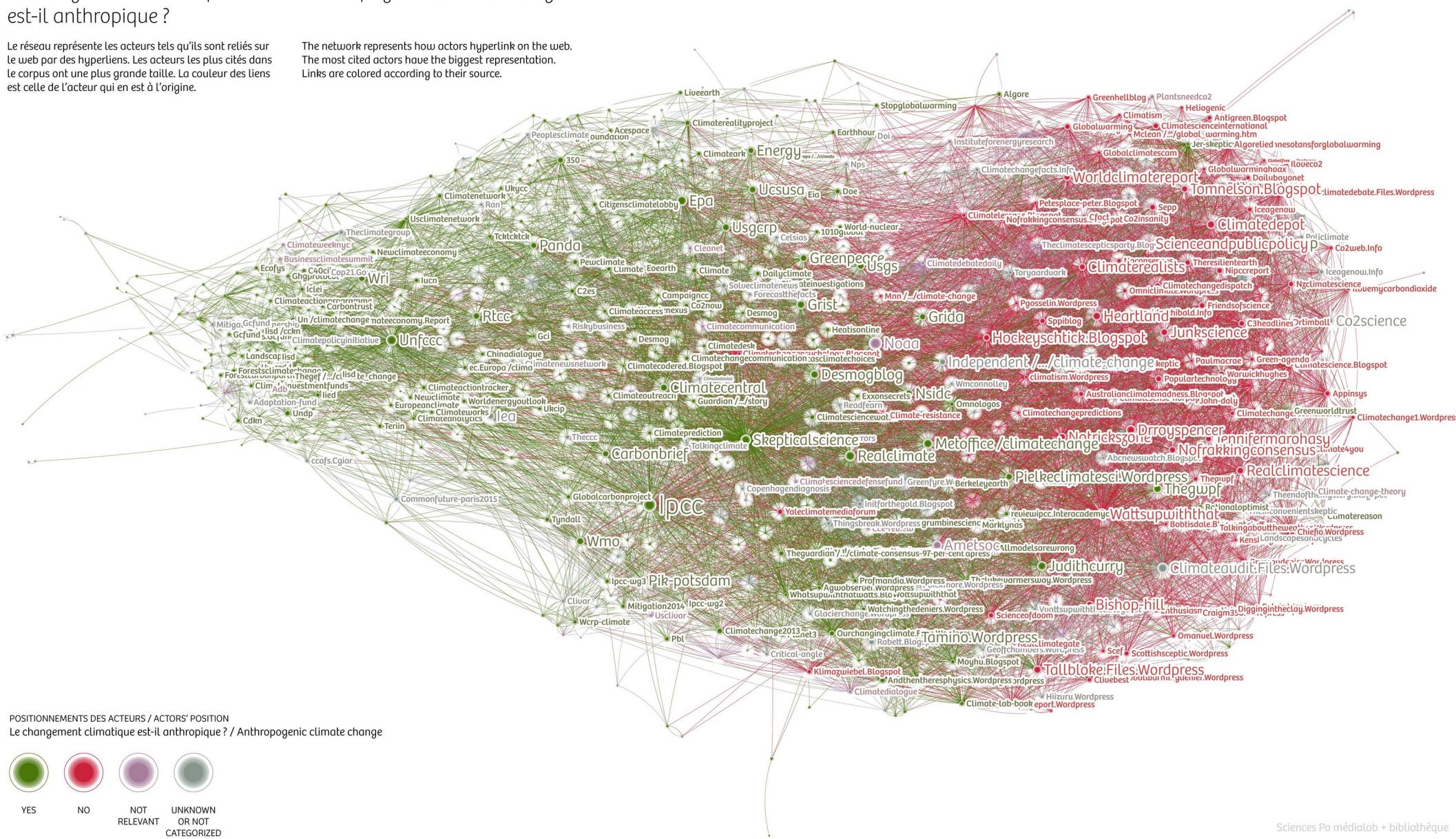
Corpus web sur le changement climatique : le changement climatique est-il anthropique ?

Le réseau représente les acteurs tels qu'ils sont reliés sur le web par des hyperliens. Les acteurs les plus cités dans le corpus ont une plus grande taille. La couleur des liens est celle de l'acteur qui en est à l'origine.

Web corpus on climate change: anthropogenic climate change

The network represents how actors hyperlink on the web. The most cited actors have the biggest representation. Links are colored according to their source.

Double Dating Data: Climate change on the web



From within: explore webpages contents

PRIVACY WEB CORPUS

SciencesPo MÉDIALAB AXA Research Fund Through Research, Protection Data Innovation Lab

ABOUT

EXPLORE WEB ENTITIES

2,313 ENTITIES
7,549 entities represented as a cloud

[]

Privacy Web Corpus Datascape

Search Apple FBI backdoor

nakedsecurity.Sophos
<https://nakedsecurity.sophos.com/category/technologies/operating-systems/>... developers would rather quit than give FBI a backdoor A lead developer for the Tor Project said

Helpnetsecurity
<https://www.helpnetsecurity.com/tag/backdoor/> encryption backdoors a bad idea March 4, 2016 backdoor cybercriminals encryption Apple and the FBI

nakedsecurity.Sophos
<https://nakedsecurity.sophos.com/2016/03/23/tor-project-says-developers-would-rather-quit-than-give-fbi-a-backdoor/> 23 Mar 2016 1 Apple , iOS , Law & order , Privacy

nakedsecurity.Sophos
<https://nakedsecurity.sophos.com/2016/03/23/tor-project-says-developers-would-rather-quit-than-give-fbi-a-backdoor/> 23 Mar 2016 1 Apple , iOS , Law & order , Privacy

Sidstamm
http://blog.sidstamm.com/2016_02_01_archive.html their phones vulnerable is not the right approach. The current public discourse on the Apple vs. FBI "open

Laquadrature
<https://mediakit.laquadrature.net//view.php?full=1&id=2374> 20160219[AC] LCP Chiffrement Apple FBI Download : MP4 , WebM , How to embed ?

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<https://mediakit.laquadrature.net//view.php?id=2374> 20160219[AC] LCP Chiffrement Apple FBI Download : MP4 , WebM , How to embed ?

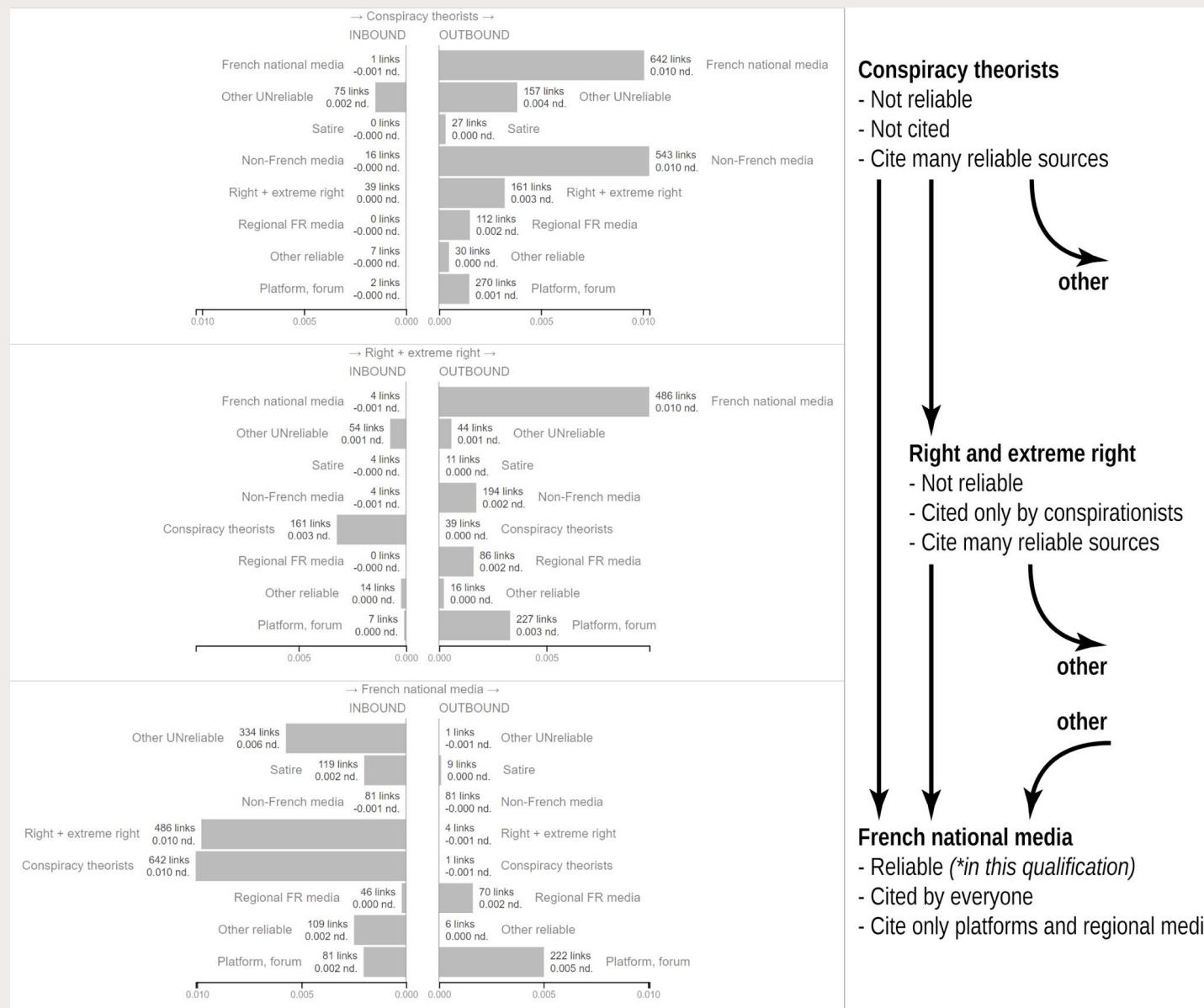
Laquadrature
<https://mediakit.laquadrature.net//view.php?full=1&id=2374> 20160219[AC] LCP Chiffrement Apple FBI Download : MP4 , WebM , How to embed ?

Topics

- Surveillance FR
- Business & Media
- Surveillance US
- Cybersecurity
- Big data & Analytics
- Data Regulation FR
- Cookies & Tracking
- Telec Operators FR
- Card and ID fraud

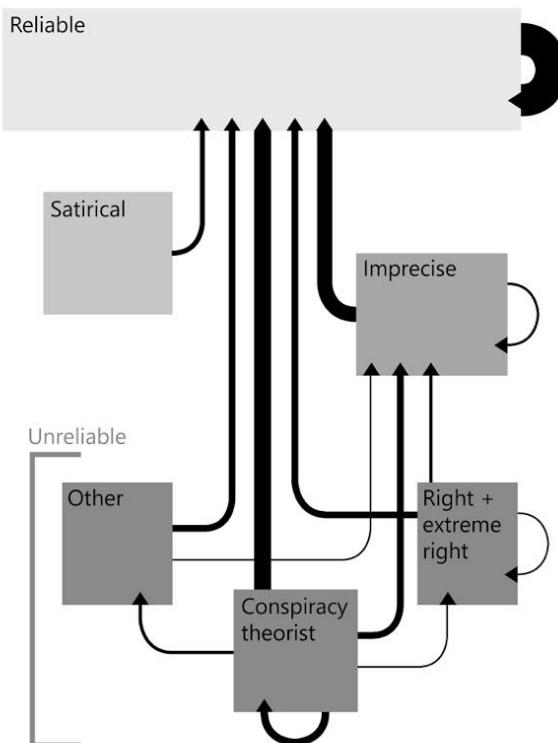
EXPLORE TOPICS ▾

From the sides: a hierarchy of directed hyperlinks



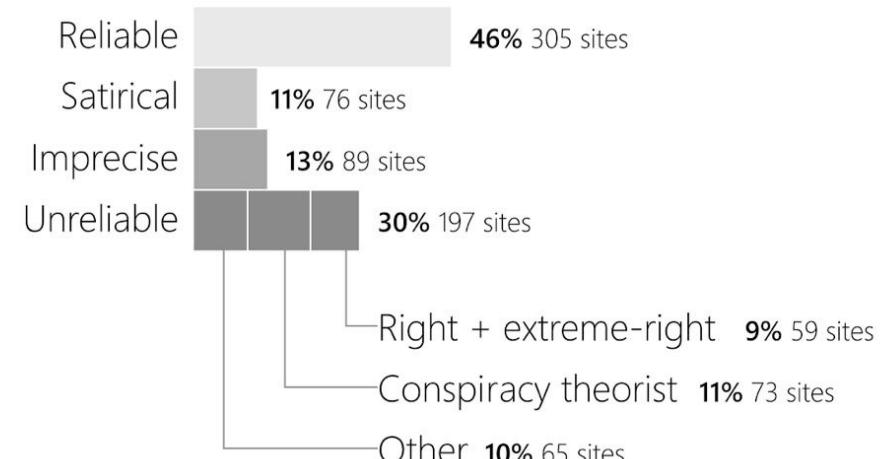
Visual Network Exploration for Data Journalists

Hyperlinks directionality: a bottom-up hierarchy

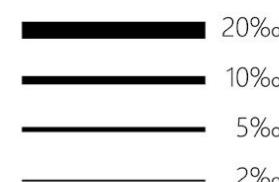


↑
Most hyperlinks stem from the unreliable and aim at the reliable resources

Each bloc's surface is proportional to the count of websites. The color code is the same as the "Décodex".



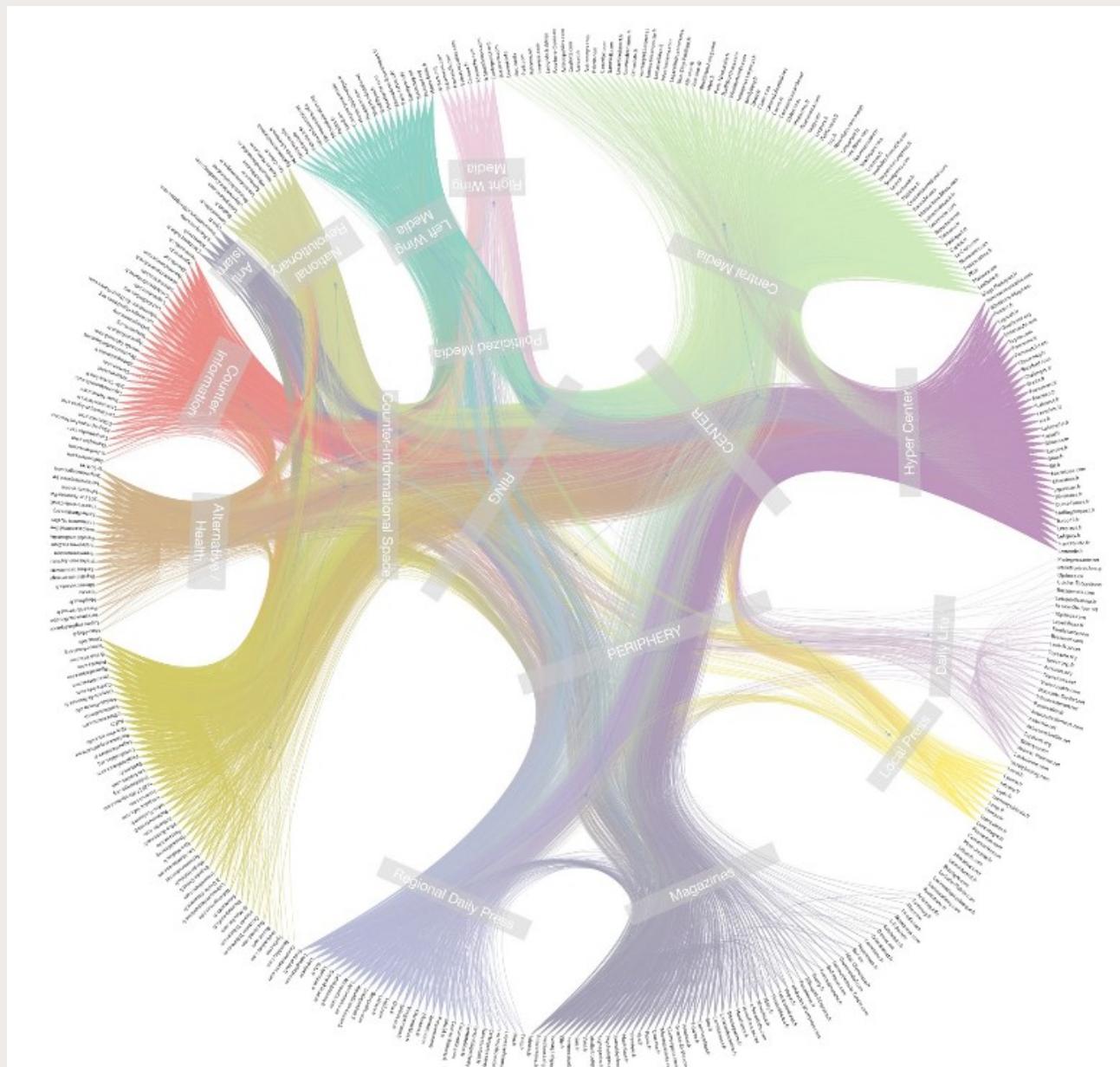
The thickness is proportional to the normalized link density*



*Accounts for the different group sizes.
Densities below 2% have been omitted.

Visual Network Exploration for Data Journalists

Explore polarization dynamics



Unfolding the multi-layered structure of the French Mediascape

Bibliography

Reference publications:

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<https://medialab.github.io/hypse-traph/fosdem2018/#/>
- Ooghe-Tabanou B., Girard P., Jacomy M., Plique G. (2018), **Hyperlink is not dead!**, ACM Proceedings of the 2nd International Conference on Web Studies (WS.2 2018) Paris.
<http://hyphe.medialab.sciences-po.fr/docs/20181004-ACM-WebStudies-HyperlinkIsNotDead.pdf>

Now let's play!

<https://hyphe.medialab.sciences-po.fr/demo/>

<https://github.com/medialab/hyphe>

Any question first?

benjamin.ooghe@sciencespo.fr

@booghe @medialab_ScPo