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Gazouilloire : Collecter des données dans la mare de tweets

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Equipex DIME-SHS
ANR-10-EQPX-19-01

Gazouilloire

Collecter des données dans la mare de tweets

Laboratoire de Linguistique Formelle – MorDev

16 avril 2019

Benjamin Ooghe-Tabanou

Sciences Po médialab – DIME Web

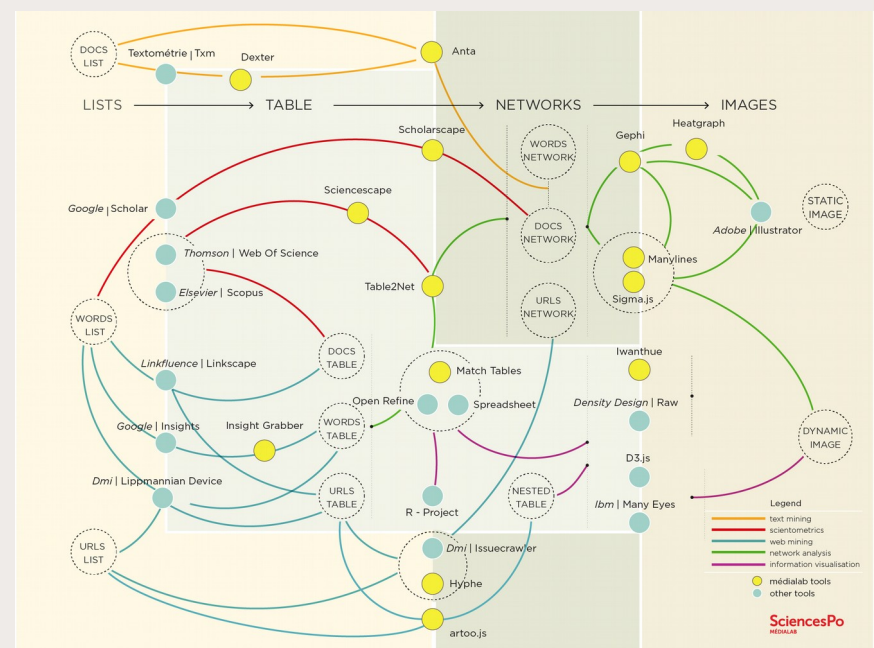
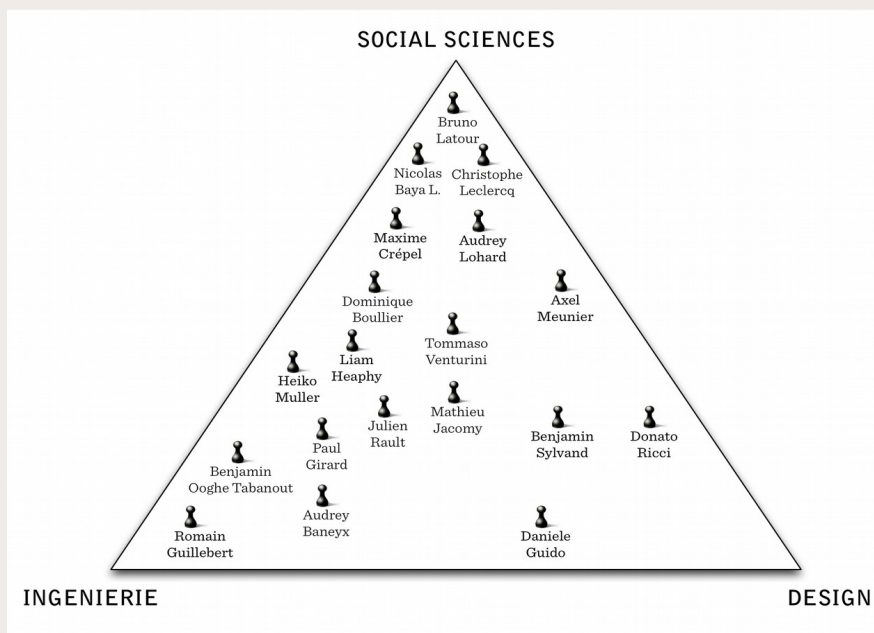
SciencesPo
MÉDIALAB

SciencesPo
DIME-SHS



Le médialab de Sciences Po

- Centre de recherche SHS à Sciences Po, fondé par Bruno Latour en mai 2009, dirigé par Dominique Cardon depuis 2017
- Numérique, sciences sociales et design
→ **Interdisciplinarité**
- Articulation des méthodes **quali & quanti**
- Étude des **traces numériques**
- Un écosystème **d'outils**
<http://tools.medialab.sciences-po.fr>
- Un atelier ouvert mensuel : le METAT
<http://www.medialab.sciences-po.fr/atelier/>

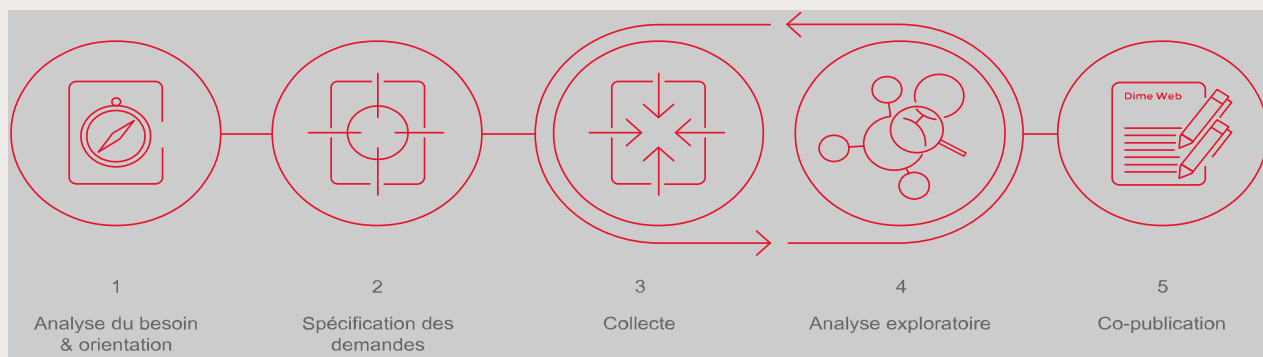
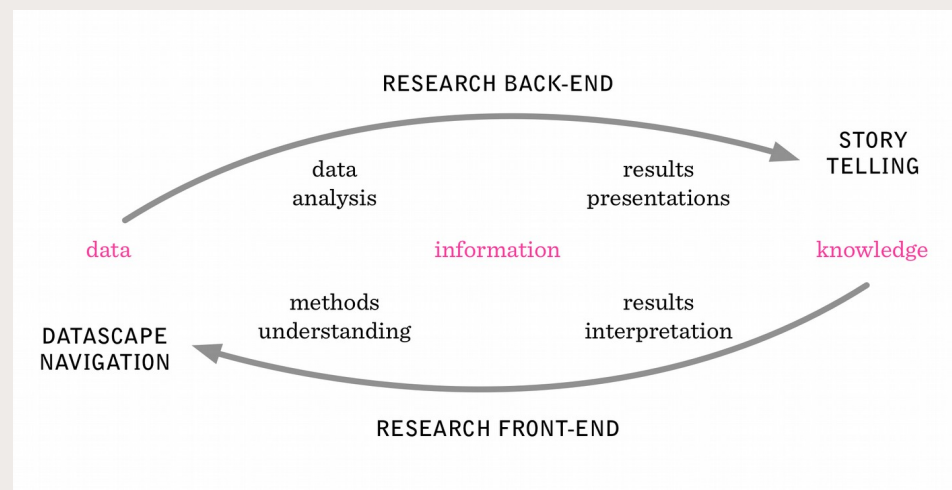


L'instrument DIME Web

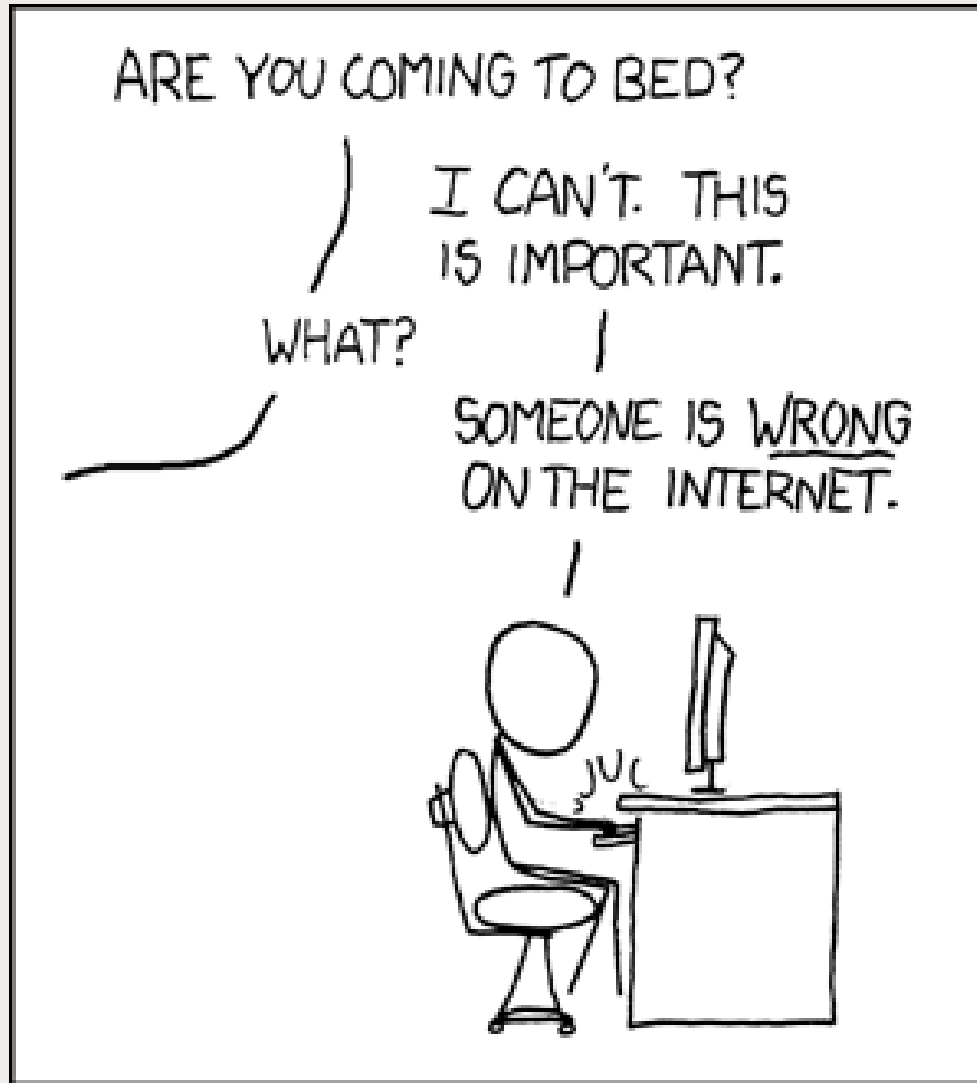
<http://dimeweb.dime-shs.sciences-po.fr>

Accompagnement technique et méthodologique à l'utilisation du Web comme nouveau terrain d'enquêtes

- Collecter, enrichir, nettoyer, visualiser et analyser des traces numériques
- Analyse de réseaux, archivage du web, analyse de controverses (ANT)
- Développement d'outils génériques libres et open source
- Extraction ciblée de contenus
- Analyse Exploratoire de Données
- Méthodes numériques & itératives ≠ tout automatique



Twitter : un espace de dialogue et débat



CC-BY-NC - Randall Munroe - XKCD

Accès contrôlé via les APIs officielles

- **Authentification nécessaire**

<https://developer.twitter.com/en/apps>

- **API gratuite :**

- recherche du passé jusqu'à 7 jours
- nombre d'appels limités

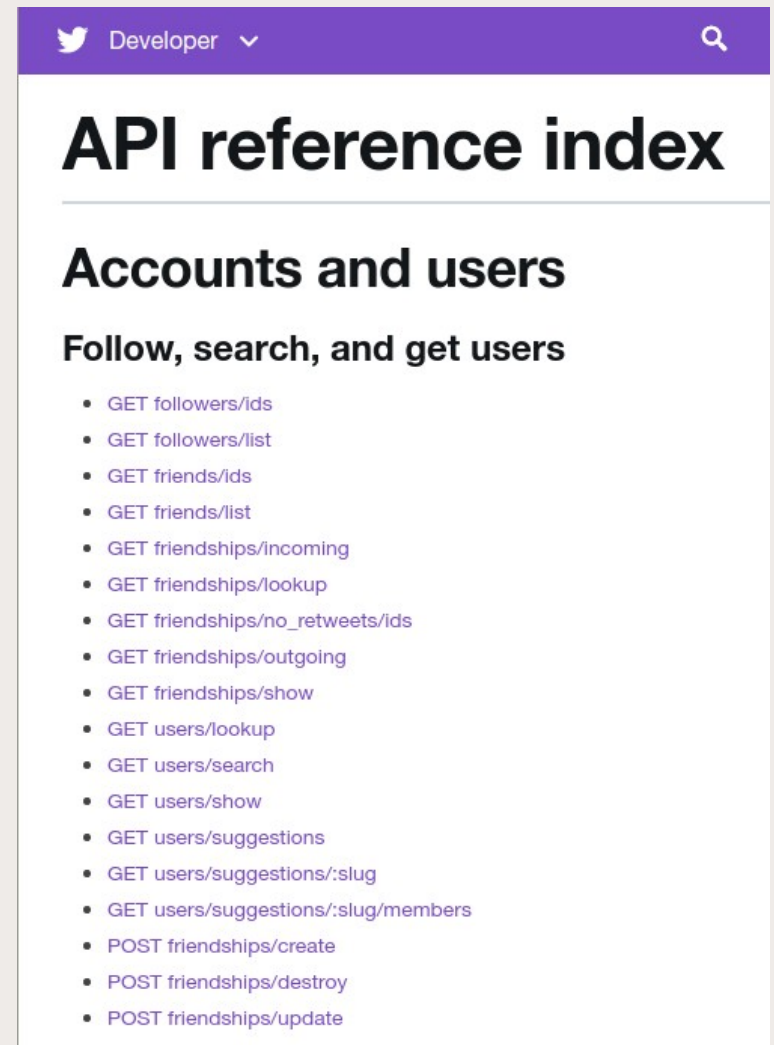
- **API payante :**

- plus riche
- plus de fonctionnalités
- très chère !

- **Différents types d'accès :**

- par ID, user, mot-clé, etc. via **REST API**
- suivi live via **Streaming API**

<https://developer.twitter.com/en/docs/api-reference-index>



Appeler l'API en programmant en Python

<https://github.com/sixohsix/twitter>

```
from twitter import Twitter, OAuth

t = Twitter(auth=OAuth(token, token_secret, consumer_key, consumer_secret))

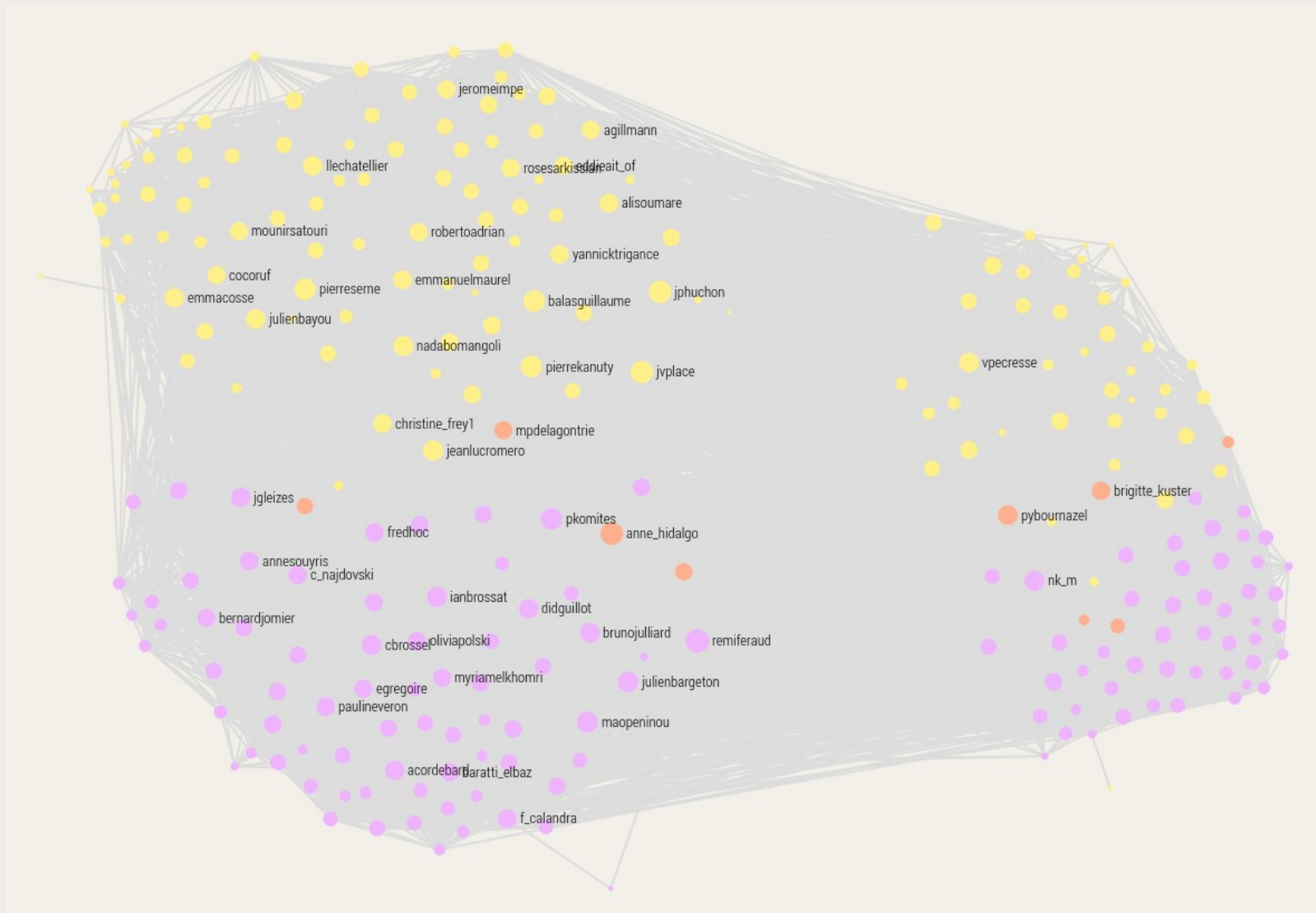
t.statuses.home_timeline(count=10)
t.statuses.user_timeline(screen_name="medialab_ScPo")

t.statuses.update(status="I'm sending tweets programatically in Python!")

for tweet in t.search.tweets(q="linguistics", tweet_mode='extended'):
    print(tweet['user']['screen_name'], tweet['text'])
```

- Helpers dans gazouilloire pour différents types d'analyses :
 - collecte des tweets d'un jeu d'users
 - collecte de métadonnées sur un corpus d'users
 - collecte de retweeters d'un ensemble d'users
 - analyse de communautés (followers, mentions, retweets, etc.)
- Outrepasser les limites de l'API via le scraping
<https://github.com/Jefferson-Henrique/GetOldTweets-python>

Explorer des réseaux de followers



Liens de proximité Twitter entre les élus du Conseil Régional d'Île-de-France et du Conseil de Paris

Gazouilloire : extraction systématique continue

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

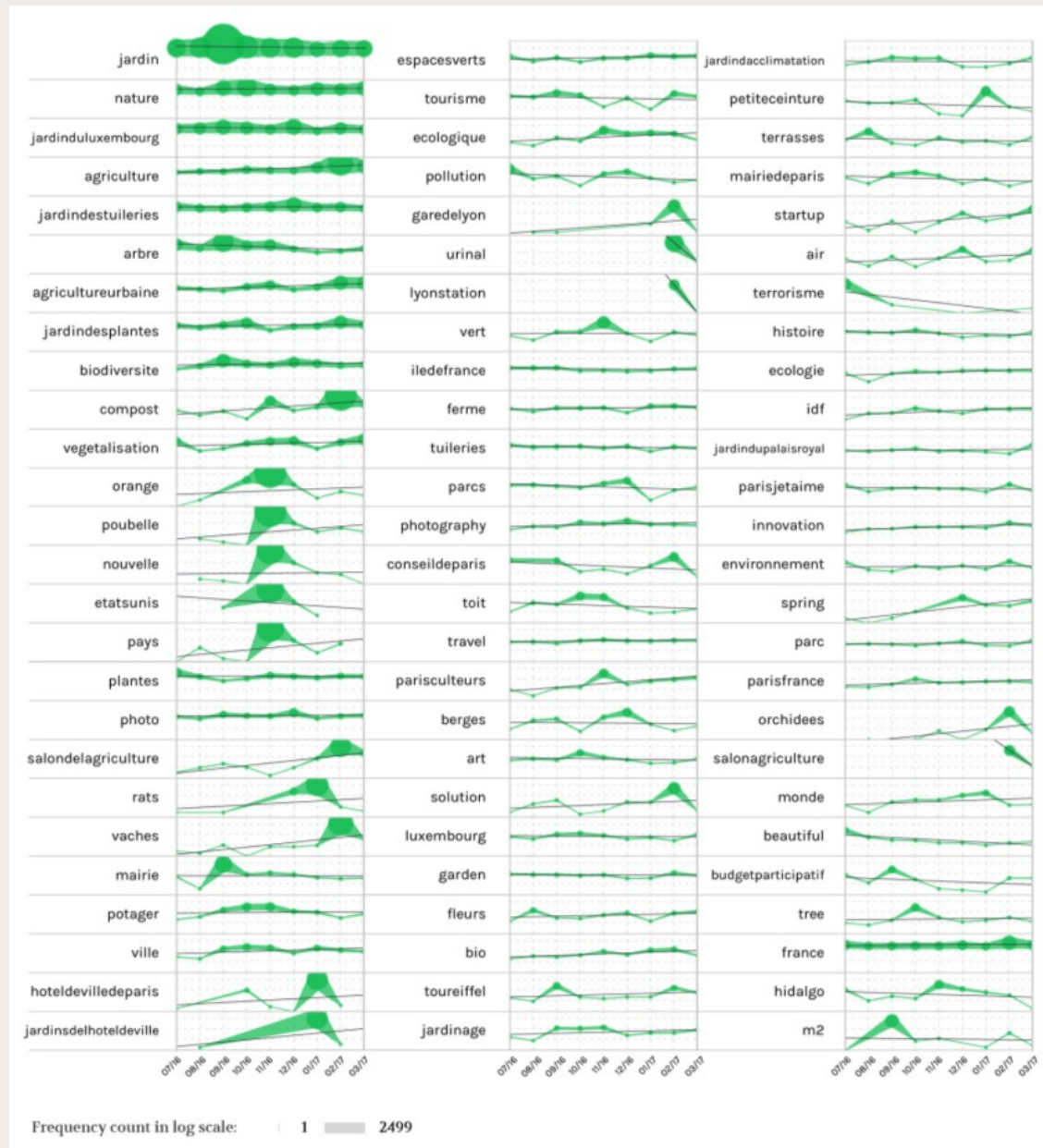
- Collecter en direct et en continu (et jusque 7 jours en arrière)
 - les tweets citant des mots-clés / hashtags
 - les tweets contenant certains morceaux d'urls
 - les tweets de certains utilisateurs ainsi que ceux les mentionnant
- Filtrer par langue, période temporelle et/ou géolocalisation
- Remonter le fil des conversations
- Collecter les médias embarqués dans les tweets (images et vidéos)
- Résoudre les redirections des urls partagées
- Exporter des fichiers tableurs de métadonnées, de textes
- Calculer des agrégats (sites ou urls partagés, etc.)

De nombreuses métadonnées à exploiter

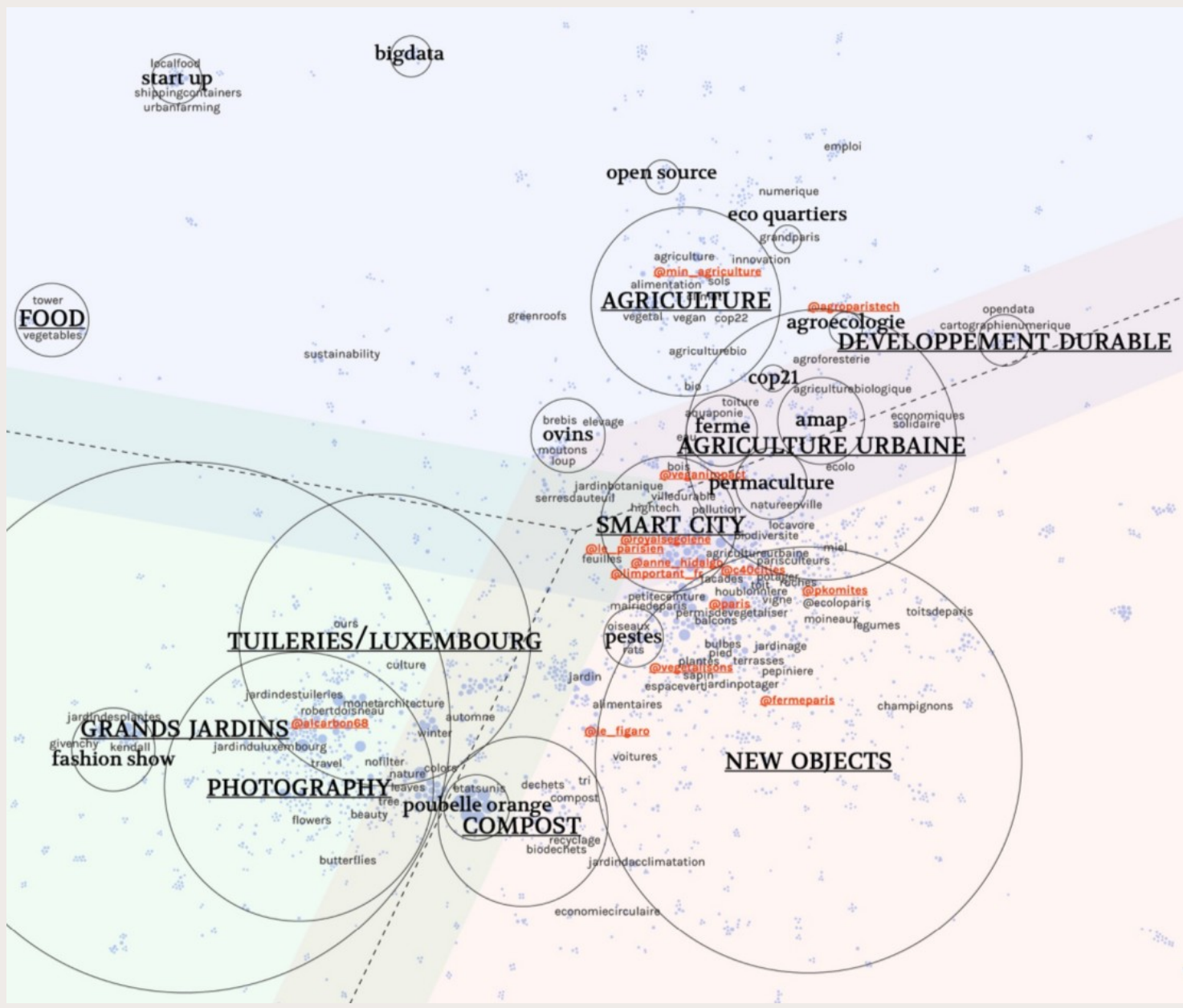
```
TWEET_FIELDS = [
    "id",                # digital ID
    "time",              # UNIX timestamp of creation
    "created_at",       # ISO datetime of creation
    "from_user_name",   # author's user text ID (@user)
    "text",              # message's text content
    "filter_level",     # internal TCAT field, ignorable
    "possibly_sensitive", # whether a link present in the message might contain sensitive content according to Twitter
    "withheld_copyright", # whether the tweet might be censored by Twitter following copyright requests, ignorable
    "withheld_scope",  # whether the content withheld is the "status" or a "user", ignorable
    "withheld_countries", # list of ISO country codes in which the message is withheld, separated by |, ignorable
    "truncated",       # whether the tweet is bigger than 140 characters, obsolete
    "retweet_count",   # number of retweets of the message (at collection time)
    "favorite_count",  # number of likes of the message (at collection time)
    "reply_count",     # number of answers to the message, dropped by Twitter (since Oct 17, now charged), unreliable and ignorable
    "lang",            # language of the message automatically identified by Twitter's algorithms (equals "und" when no language could be detected)
    "to_user_name",    # text ID of the user the message is answering to
    "to_user_id",       # digital ID of the user the message is answering to
    "in_reply_to_status_id", # digital ID of the tweet the message is answering to
    "source",          # medium used by the user to post the message
    "source_name",     # name of the medium used to post the message
    "source_url",      # link to the medium used to post the message
    "location",        # location declared in the user's profile (at collection time)
    "lat",              # latitude of messages geolocalized
    "lng",              # longitude of messages geolocalized
    "from_user_id",    # author's user digital ID
    "from_user_realname", # author's detailed textual name (at collection time)
    "from_user_verified", # whether the author's account is certified
    "from_user_description", # description given in the author's profile (at collection time)
    "from_user_url",   # link to a website given in the author's profile (at collection time)
    "from_user_profile_image_url", # link to the image avatar of the author's profile (at collection time)
    "from_user_utcoffset", # time offset due to the user's timezone, dropped by Twitter (since May 18), ignorable
    "from_user_timezone", # timezone declared in the user's profile, dropped by Twitter (since May 18), ignorable
    "from_user_lang",  # language declared in the user's profile (at collection time)
    "from_user_tweetcount", # number of tweets sent by the user (at collection time)
    "from_user_followercount", # number of users following the author (at collection time)
    "from_user_friendcount", # number of users the author is following (at collection time)
    "from_user_favourites_count", # number of likes the author has expressed (at collection time)
    "from_user_listed", # number of users lists the author has been included in (at collection time)
    "from_user_withheld_scope", # whether the user content is withheld, ignorable
    "from_user_withheld_countries", # list of ISO country codes in which the user content is withheld, separated by |, ignorable
    "from_user_created_at", # ISO datetime of creation of the author's account
    "collected_via_thread", # whether the tweet was retrieved only as part of a thread including a tweet matching the desired query
    "retweeted_id",     # digital ID of the retweeted message
    "retweeted_user_name", # text ID of the user who authored the retweeted message
    "retweeted_user_id", # digital ID of the user who authored the retweeted message
    "quoted_id",        # digital ID of the retweeted message
    "quoted_user_name", # text ID of the user who authored the retweeted message
    "quoted_user_id",   # digital ID of the user who authored the retweeted message
    "links",             # list of links included in the text content, with redirections resolved, separated by |
    "medias_urls",       # list of links to images/videos embedded, separated by |
    "medias_files",      # list of filenames of images/videos embedded and downloaded, separated by |, ignorable when medias collections isn't enabled
    "mentioned_user_names", # list of text IDs of users mentionned, separated by |
    "mentioned_user_ids", # list of digital IDs of users mentionned, separated by |
    "hashtags"          # list of hashtags used, lowercased, separated by |
]
```

1

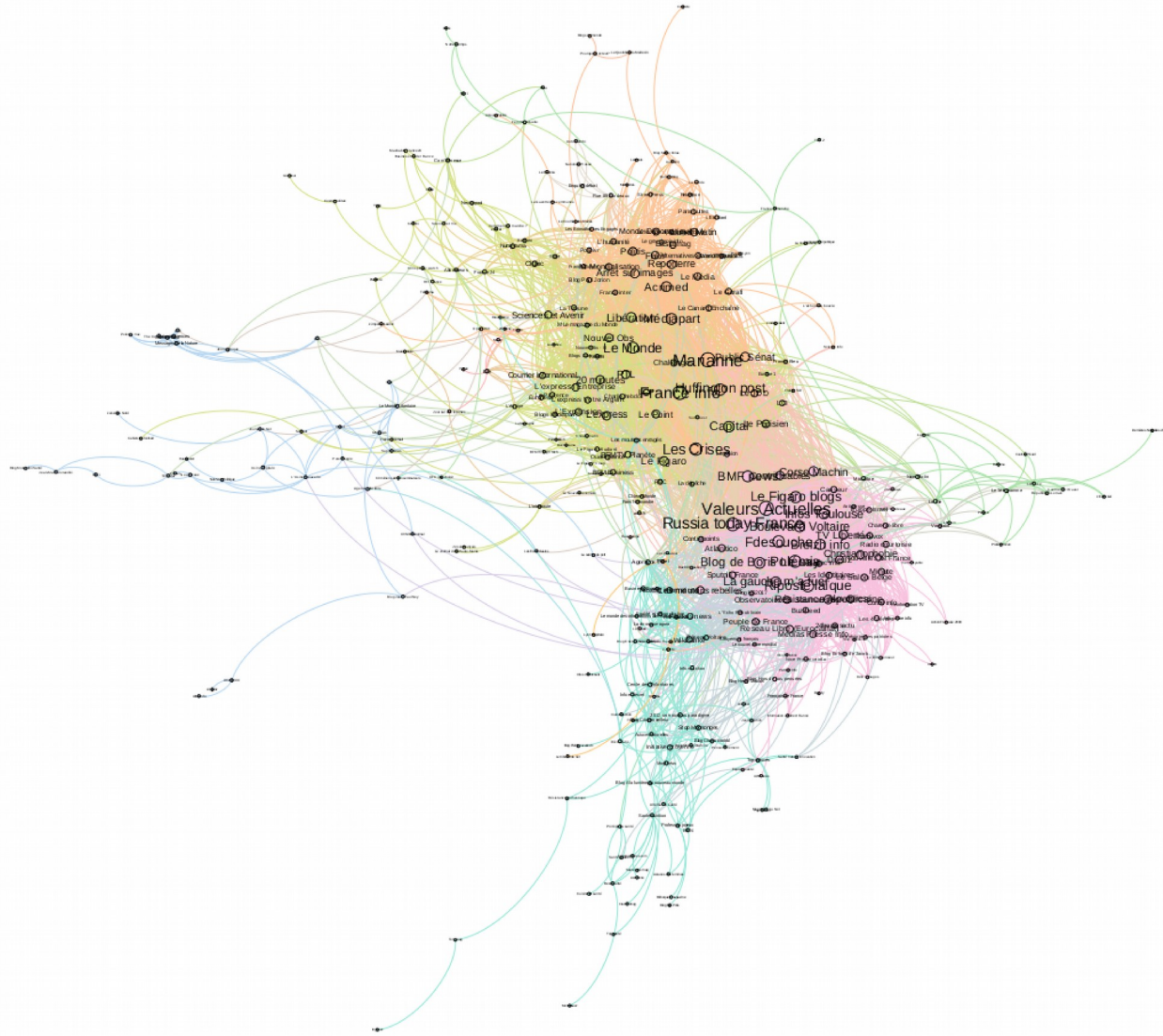
Explorer les dynamiques temporelles



Explorer des réseaux sémantiques



Explorer des réseaux de co-citation de sites web



Graphe obtenu à partir d'un corpus de 60 millions de tweets citant des médias français

Explorer l'espace visuel d'un corpus



CatWalk : sélection qualitative de tweets

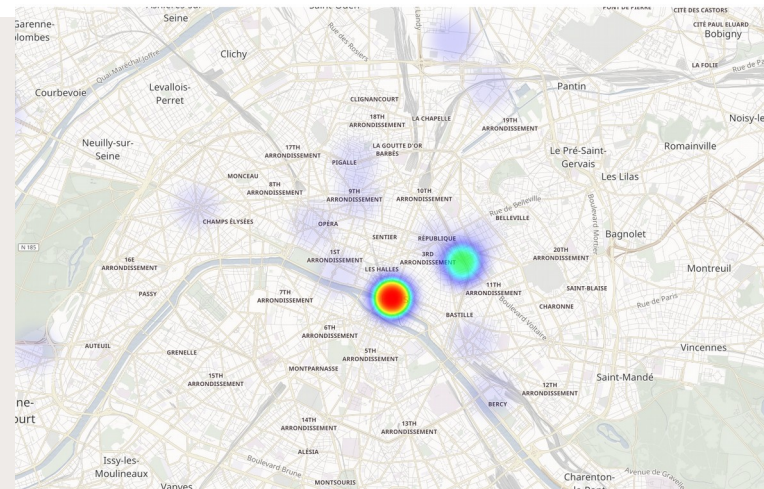
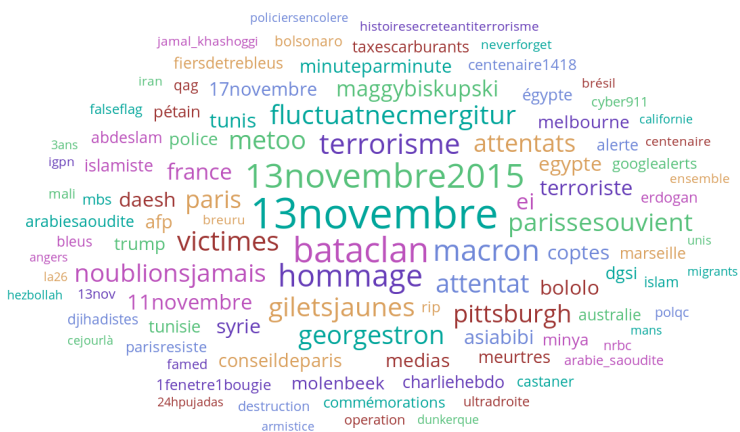
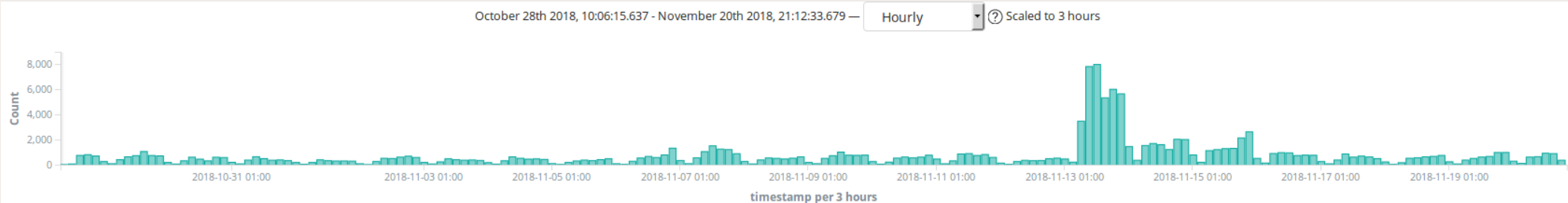
<https://medialab.github.io/catwalk/>

- Passer en revue rapidement « à la Tinder » tous les tweets d'un CSV pour décider de les inclure / exclure d'un corpus

The screenshot displays the CatWalk web interface. At the top left, the word "CATWALK" is visible. To its right are navigation buttons: "prev", a central input field containing "0", and "next". Further right is a "Download" button with a counter showing "0" in a red circle, "434" in a grey circle, and "2" in a green circle. Below this is a large green button labeled "IN". The main content area features a tweet from "RE•WORK @teamrework" with a "Follow" button. The tweet text reads: "Inside OpenAI, Elon Musk's Wild Plan to Set Artificial Intelligence Free ow.ly/4nfo2S #AI @open_ai" and is dated "7:15 PM - 29 Apr 2016". It includes a photo of Elon Musk and a link to a Wired article. Below the tweet are icons for reply, retweet (7), and like (15). On the right side of the interface is a vertical menu with buttons: "previous", "next", "IN" (highlighted in green), "OUT" (highlighted in red), "UNDECIDED", and "save". At the bottom of the interface, there is a footer area with the user's profile picture and name "@teamrework", and a truncated version of the tweet text: "Inside OpenAI, Elon Musk's Wild Plan to Set Artificial Intelligence Free <http://ow.ly/4nfo2S> #AI @open_ai".

Perspectives futures

- Achever la migration MongoDB → ElasticSearch (+ Kibana)



- Développement d'interfaces web pour Gazouilloire

- Administration des collectes
- Intégration native de CatWalk
- Analyse exploratoire visuelle

Merci, et maintenant, à vous de jouer !

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

Questions?

benjamin.ooghe@sciencespo.fr

[@boogheta](#) [@medialab_ScPo](#)

Obtenir des clés d'API Twitter

<https://developer.twitter.com/en/apps>

Developer Use cases Products Docs More Apply Apps

STATUS: IN PROGRESS

- ✔ User profile
- Account details
- Use case details
- Terms of service
- Email verification


Interested in a developer account?

Some of our premium APIs are currently in Beta. By applying, you agree to receive emails from our team requesting feedback on your experience.

Select a user profile to associate

By default, this @username will be the admin of this developer account. If you are creating a developer account on behalf of your organization, you may wish to use your organization's @username as it is most likely to own the Apps you will use to access the API endpoints or warrant special permissions. You'll be able to invite teammates and re-assign roles later within your developer account settings.

Associate your current Twitter @username

 **boogheta**
@boogheta

The phone number associated with this Twitter @username is not verified. You must add a valid phone number and verify it prior to applying for developer access.

[Add a valid phone number](#)

[Sign in as a different Twitter @username](#)
[Create new Twitter @username](#)

Installer Gazouilloire et son environnement

(Attention : conçu pour Linux et Mac OS X)

- **Installer la base de données MongoDB :**
<https://docs.mongodb.com/manual/installation/>

```
# Clone Gazouilloire's git repository (branch elasticPy3)
git clone https://github.com/medialab/gazouilloire.git -b elasticPy3
cd gazouilloire

# Create a Python environment (using PyEnv)
curl https://pyenv.run | bash
pyenv install 3.6.5
pyenv virtualenv 3.6.5 gazouilloire
pyenv activate gazouilloire
pip install -r requirements.txt

# Configure Gazouilloire
cp config.json{.example,}
```

Configurer Gazouilloire

```
{
  "twitter": {
    "key": "xxxxxxxxxxxxxxxxxxxx",
    "secret": "xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx",
    "oauth_token": "xxxxxxxx-xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx",
    "oauth_secret": "xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx"
  },
  "database": {
    "type": "mongo",
    "host": "localhost",
    "port": 27017,
    "db": "gazouilloire"
  },
  "keywords": [
    "giletsjaunes",
    "@DonaldTrump"
  ],
  "url_pieces": [
    "lemonde.fr"
  ],
  "time_limited_keywords": {
    "bieber": [
      ["2014-05-08 16:00", "2014-05-08 16:05"]
    ]
  },
  "language": "fr",
  "geolocalisation": "Paris, France",
  "geolocalisation_type": "city",
  "resolve_redirected_links": true,
  "grab_conversations": true,
  "download_medias": false,
  "medias_directory": "medias",
  "timezone": "Europe/Paris",
  "debug": false
}
```

Lancer une collecte et exporter les données

```
[18:31](elasticPy3 %=)boogheta@medialaptop3:~/dev/gazouilloire-elastic $ ./gazouilloire/run.py
[2019-04-12 18:31:44.361844] INFO: Pile length: 0
[2019-04-12 18:31:44.363171] INFO: Starting stream track until None
[2019-04-12 18:31:44.363317] DEBUG: Calling stream with args {'filter_level': 'none', 'stall_warnings': 'true', 'language': 'fr', 'track': 'giletsjaunes,gilets jaunes,lemonde fr'}
[2019-04-12 18:31:44.739441] INFO: Starting search queries cycle with 606 remaining calls for the next 860 seconds
[2019-04-12 18:31:44.739500] DEBUG: Starting search query on giletsjaunes OR gilets%20jaunes OR url:"lemonde fr" since 0
[2019-04-12 18:31:45.194446] DEBUG: [search] +85 tweets (giletsjaunes OR gilets%20jaunes OR url:"lemonde fr")
[2019-04-12 18:31:45.317005] DEBUG: [stream] +1 tweet
[2019-04-12 18:31:45.662340] DEBUG: [search] +100 tweets (giletsjaunes OR gilets%20jaunes OR url:"lemonde fr")
[2019-04-12 18:31:45.694745] DEBUG: [stream] +1 tweet
[2019-04-12 18:31:45.949036] DEBUG: [stream] +1 tweet
[2019-04-12 18:31:46.155623] DEBUG: [search] +93 tweets (giletsjaunes OR gilets%20jaunes OR url:"lemonde fr")
[2019-04-12 18:31:46.363529] INFO: Pile length: 281
[2019-04-12 18:31:46.408398] DEBUG: [stream] +1 tweet
[2019-04-12 18:31:46.626098] DEBUG: Saved 281 tweets in database
```

```
[18:34](elasticPy3 %=)boogheta@medialaptop3:~/dev/gazouilloire-elastic $ PYTHONPATH=. bin/export_csv_as_tcat.py > tweets.csv
25% (15145 of 58439) |#### | Elapsed Time: 0:00:04 ETA: 0:00:13
```

```
# To export a csv with most fields (formatted similarly to [DMI's TCAT](https://github.com/digitalmethodsinitiative/dmi-tcat)):
PYTHONPATH=. bin/export_csv_as_tcat.py

# To export a csv of all tweets having a specific word in their text:
PYTHONPATH=. bin/export_csv_as_tcat.py medialab

# To export a csv of all tweets having one of many specific words in their text:
PYTHONPATH=. bin/export_csv_as_tcat.py medialab digitalhumanities datajournalism '#python'

# To export a csv of all tweets matching a specific MongoDB query, for instance by user_name:
PYTHONPATH=. bin/export_csv_as_tcat.py '{"user_screen_name': 'medialab_ScPo}'

# To export a csv with the most useful fields:
PYTHONPATH=. bin/export_csv_as_tcat.py

# To export the whole text content of the tweets:
PYTHONPATH=. bin/export_all_text.py

# To compute the top shared web domains in the collected tweets:
PYTHONPATH=. bin/export_shared_domains.py
```