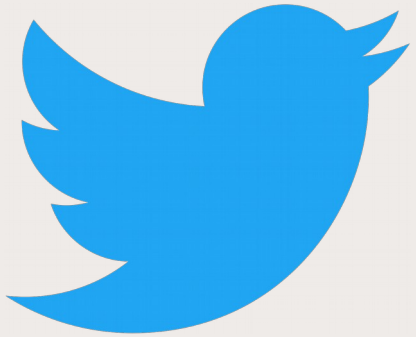
Gazouilloire : Collecter des données dans la mare de tweets

Benjamin Ooghe-Tabanou



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

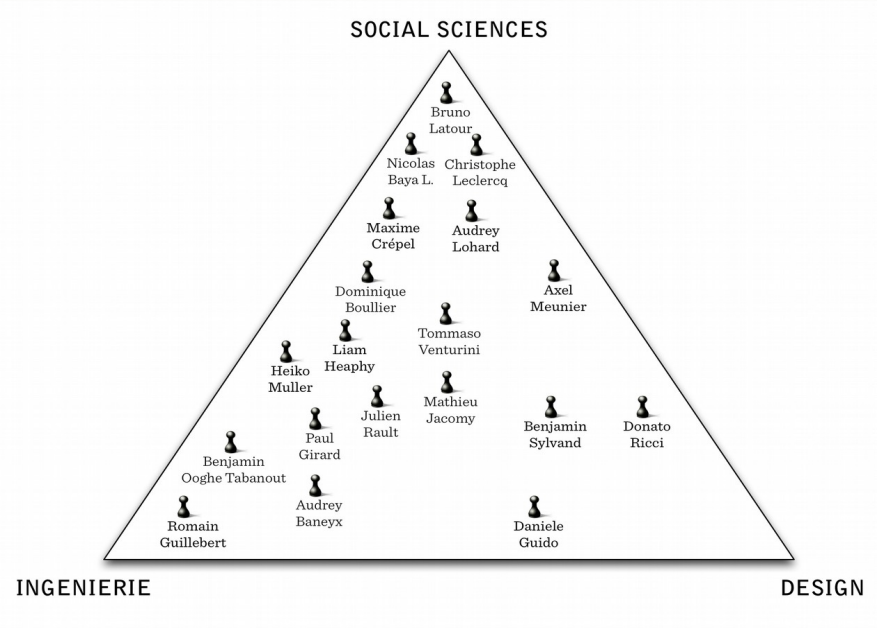
SciencesPo DIME-SHS

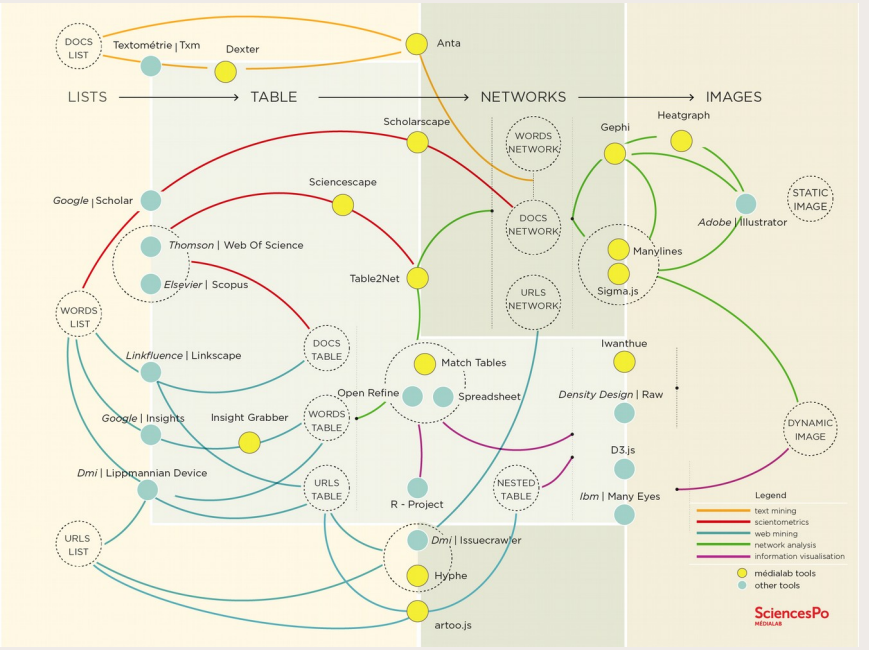
Le médialab de Sciences Po

https://medialab.sciencespo.fr

- 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/



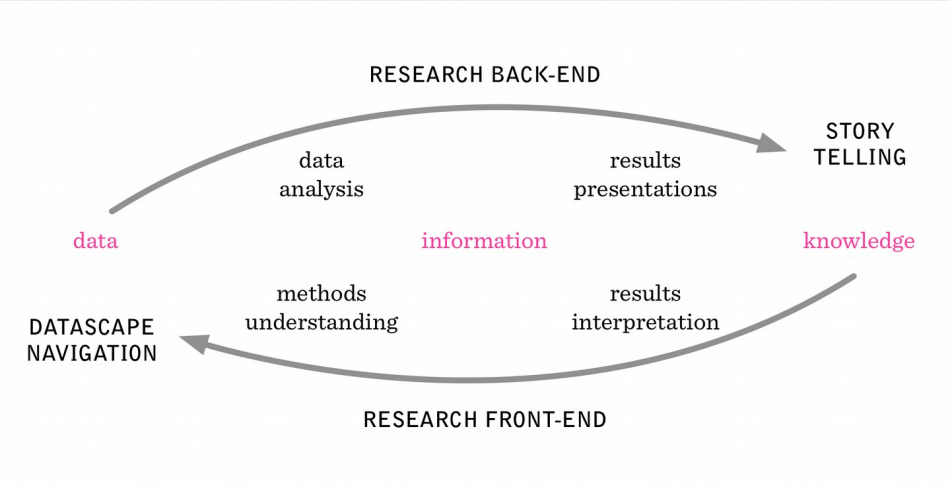


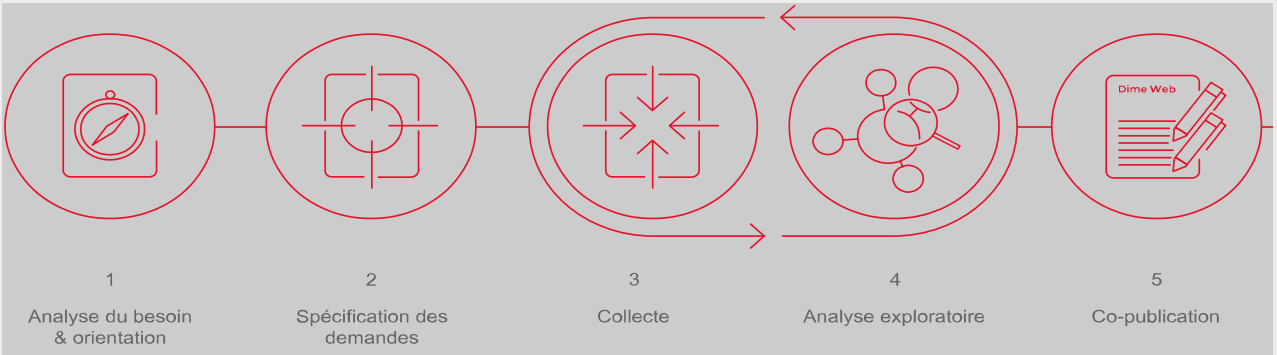
L'instrument DIME Web

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

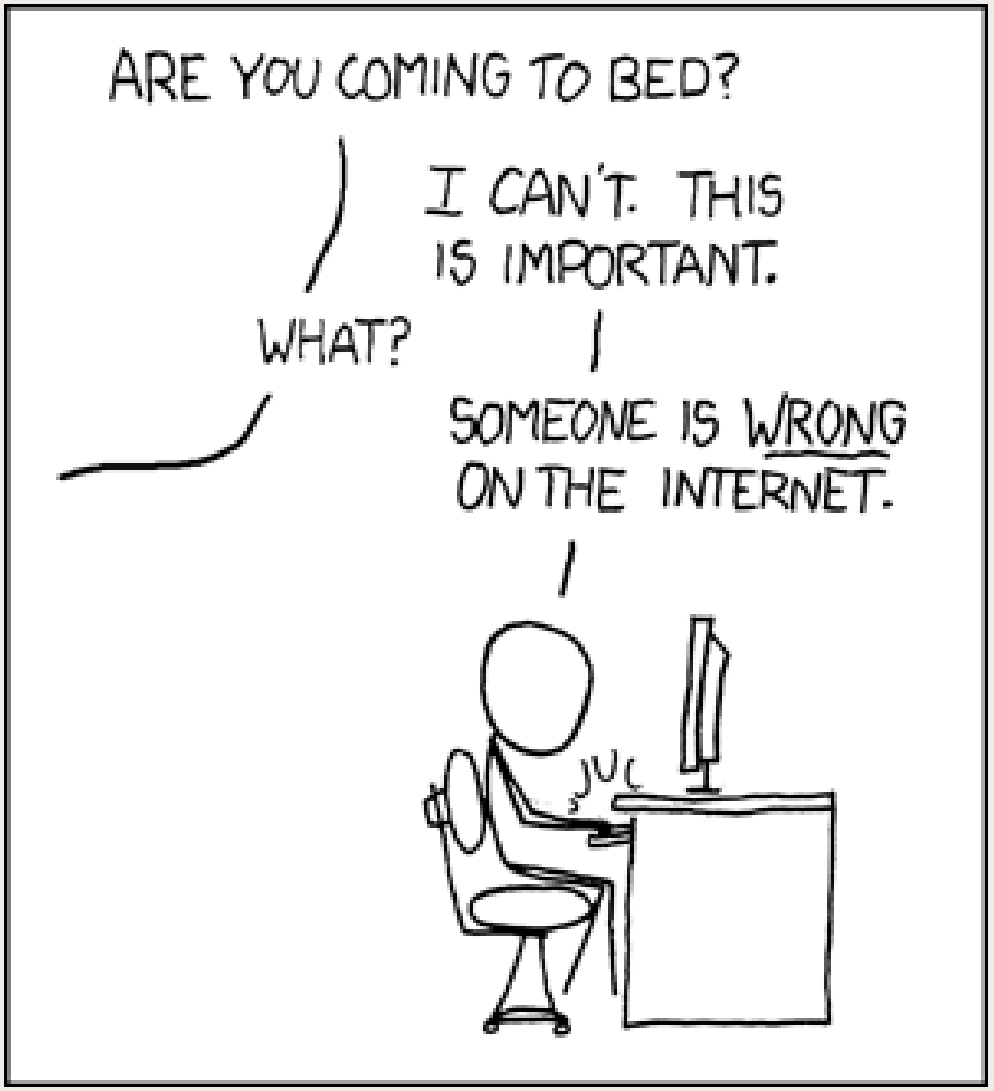
Accompagnement technique et méthodologique à l'utilisation du Web comme nouveau terrain d'enquêtes

- 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



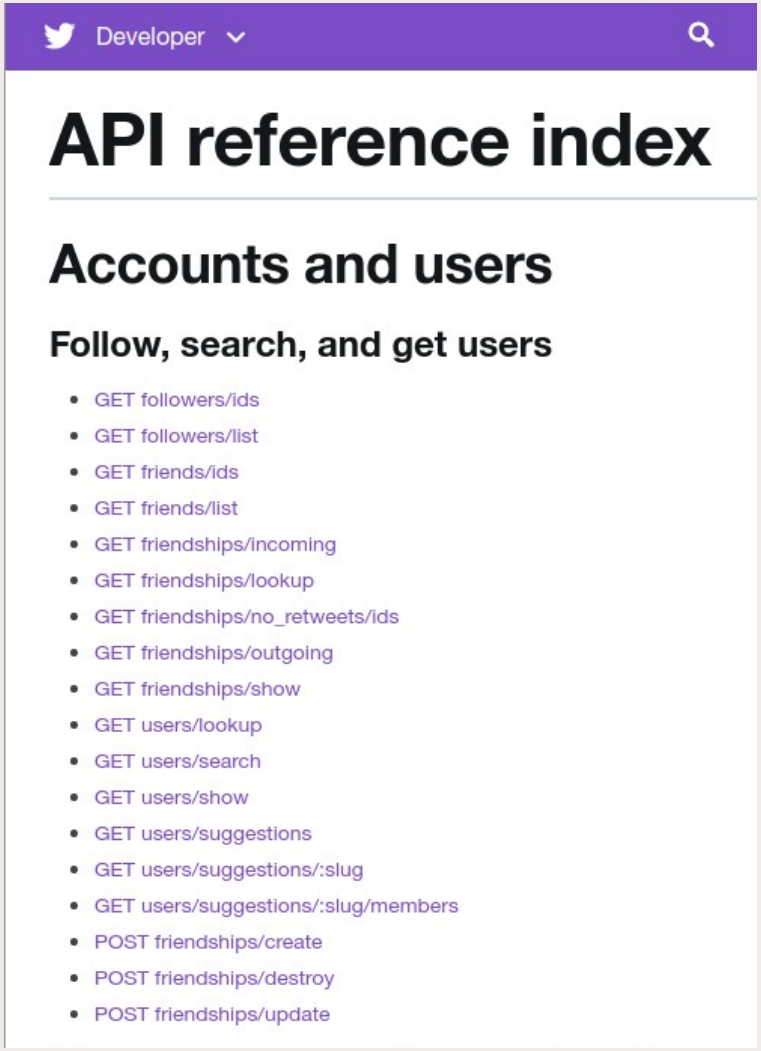
Accès contrôlé via les APIs officielles

- **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



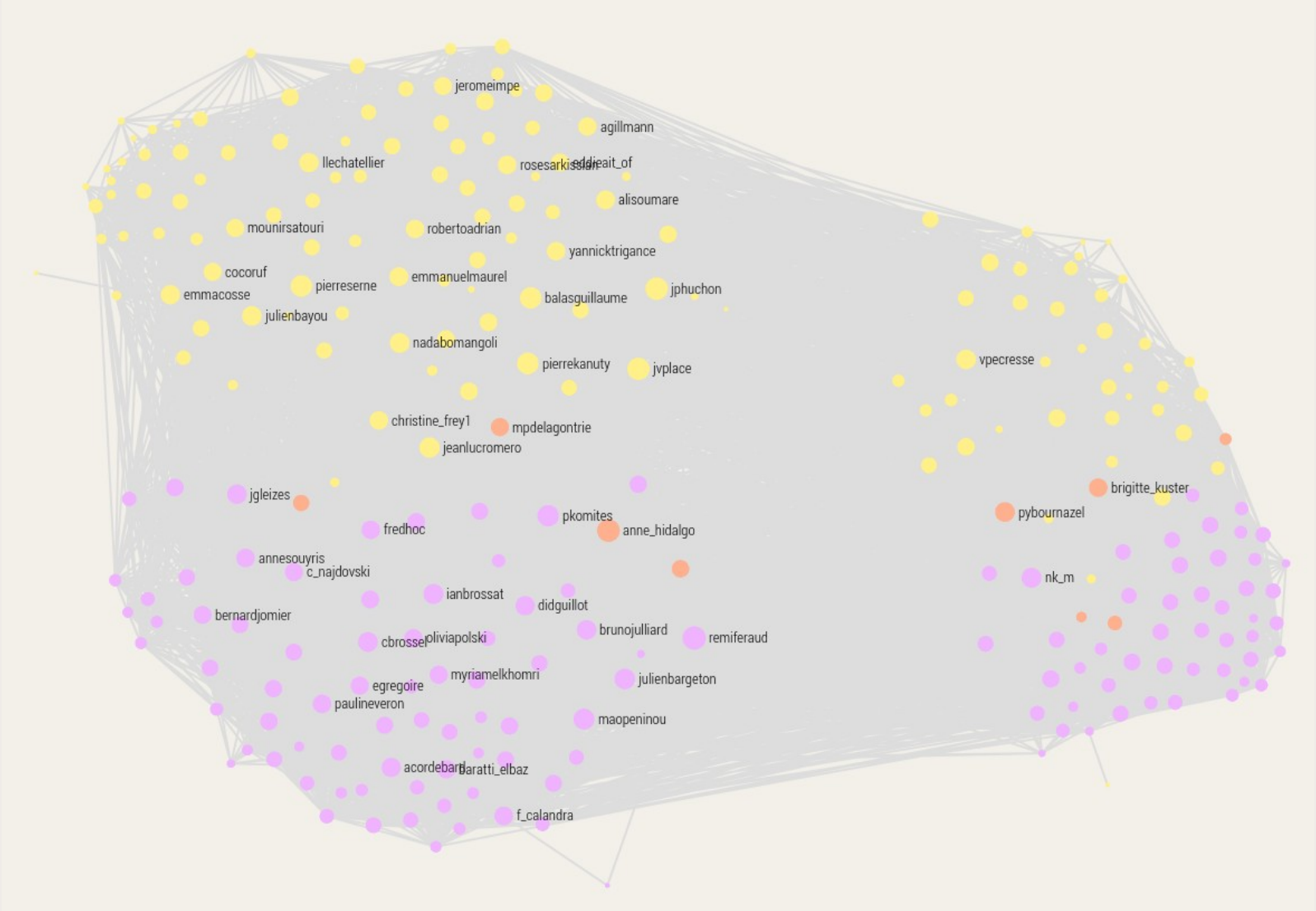
Appeler l'API en programmant en Python

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

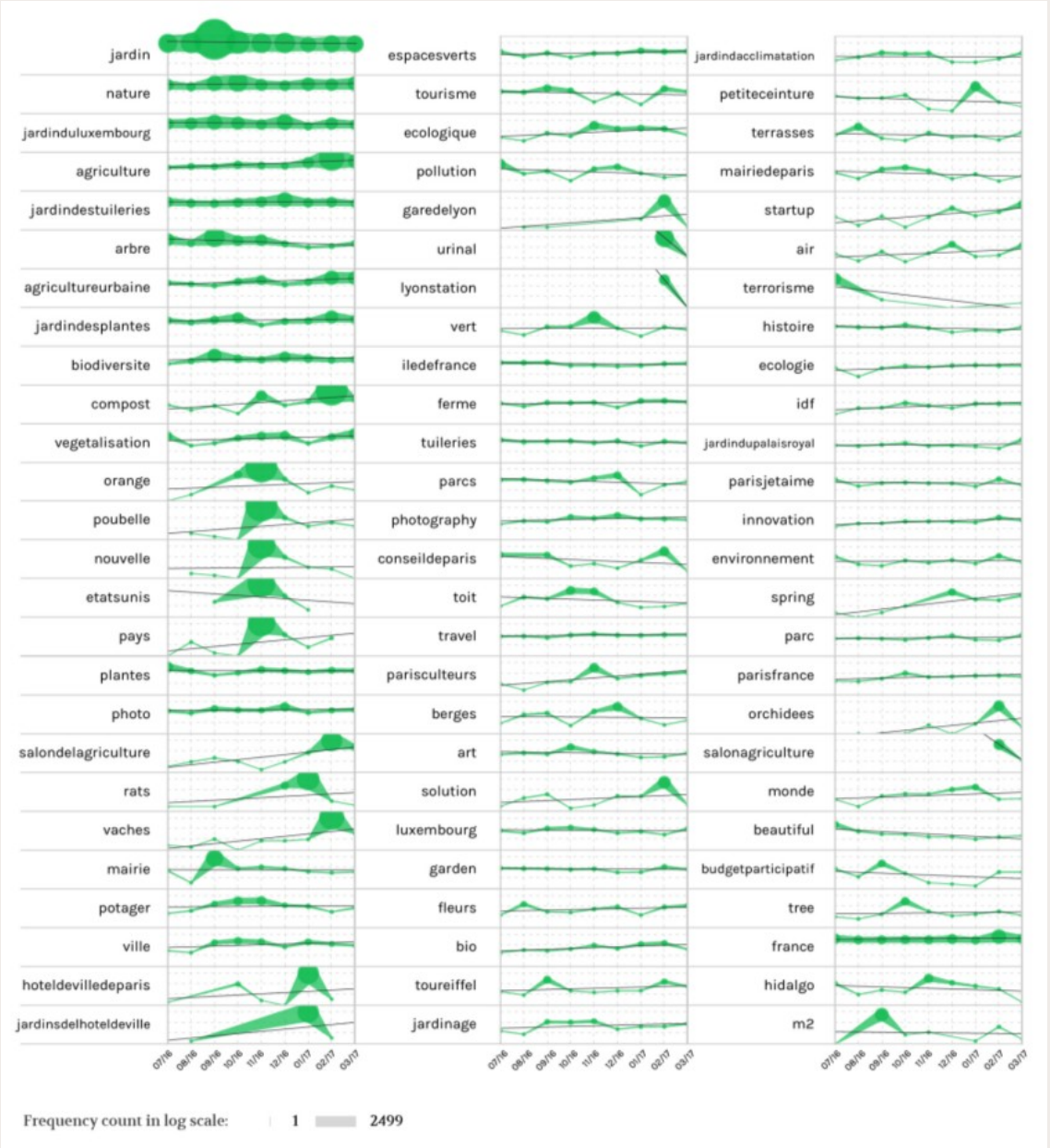
https://github.com/medialab/gazouilloire

- 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.)

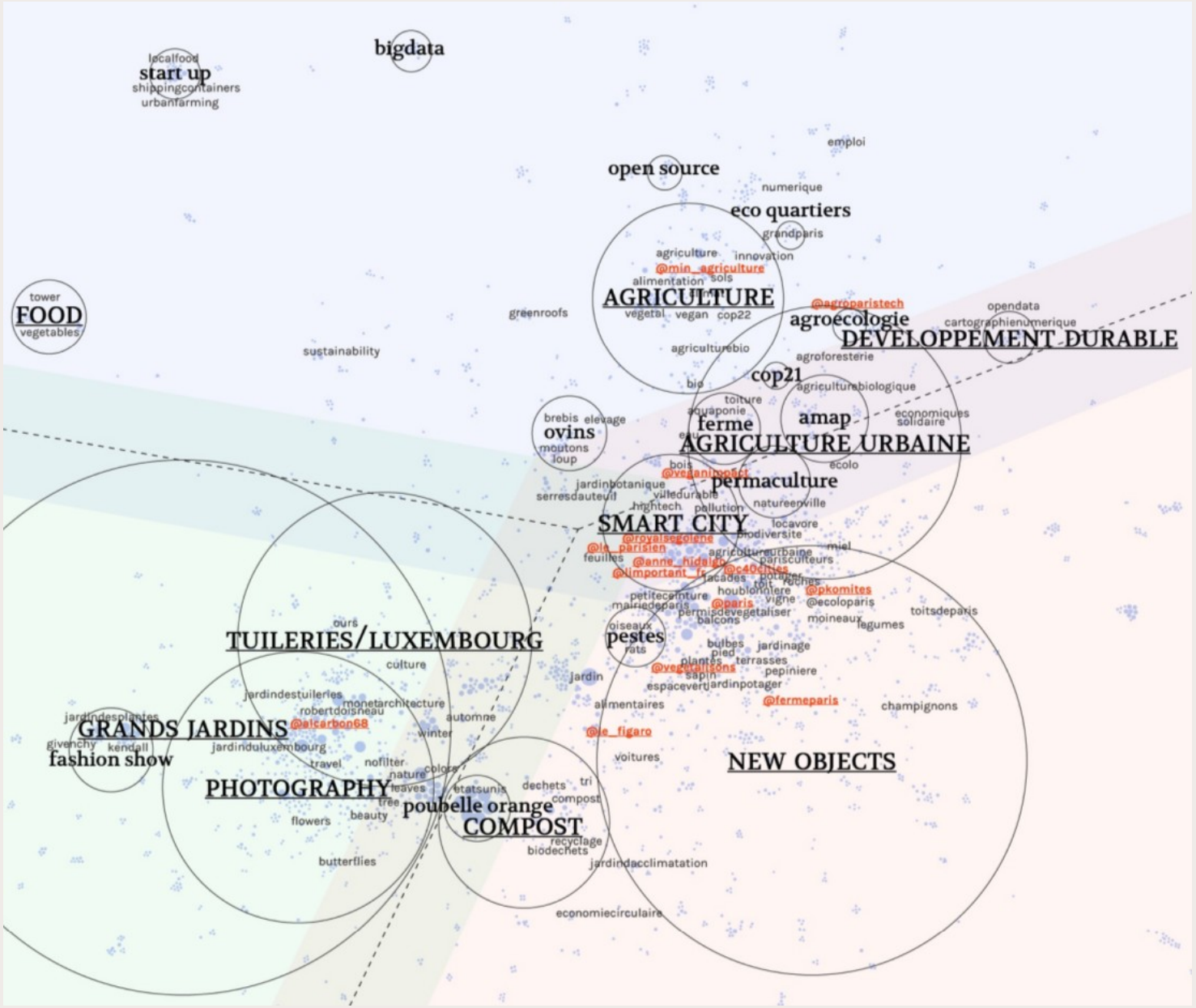
De nombreuses métadonnées à exploiter

```
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 authoring 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 authoring 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 |
]
```

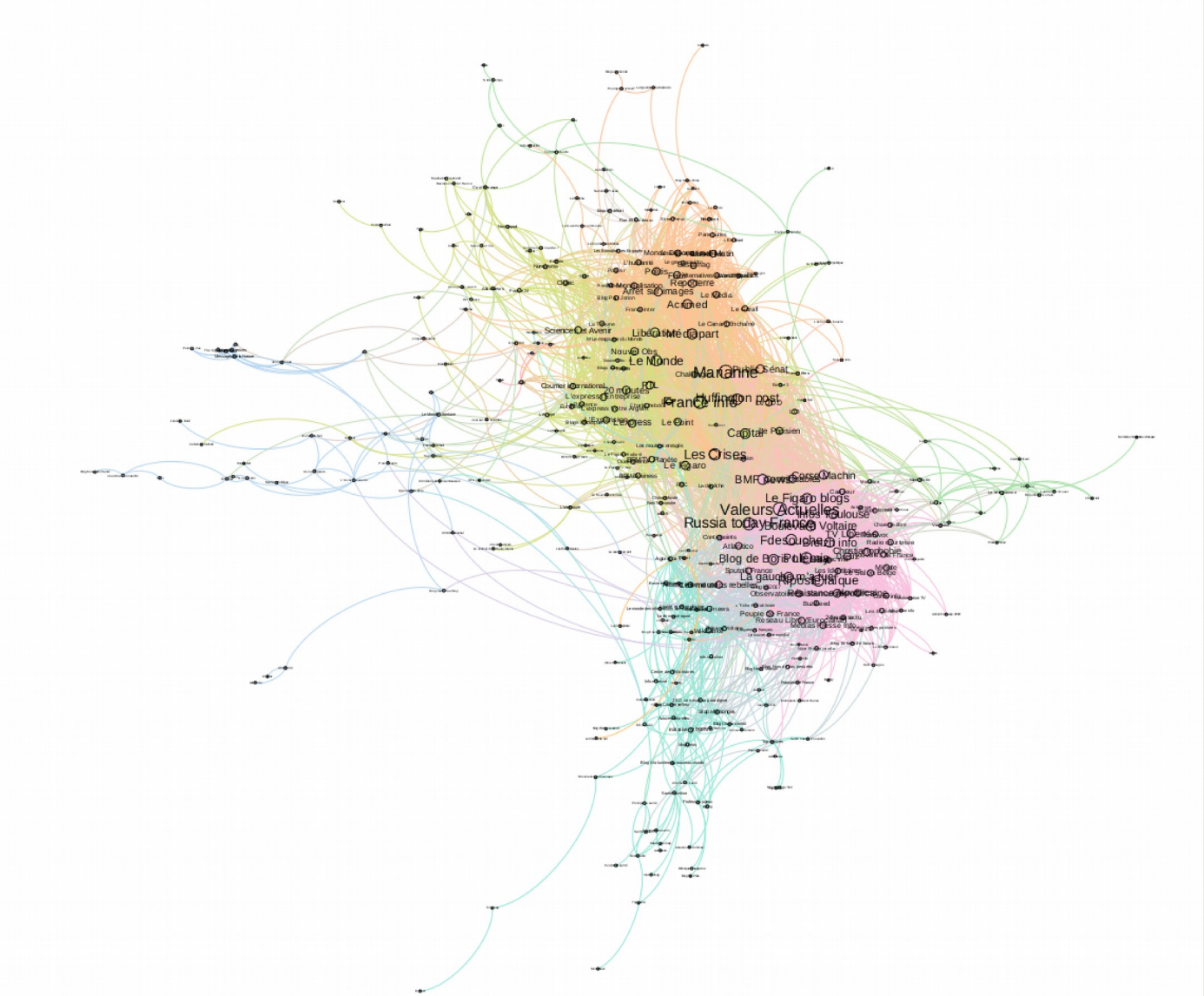
Explorer les dynamiques temporelles



Explorer des réseaux sémantiques



Explorer des réseaux de co-citation de sites web



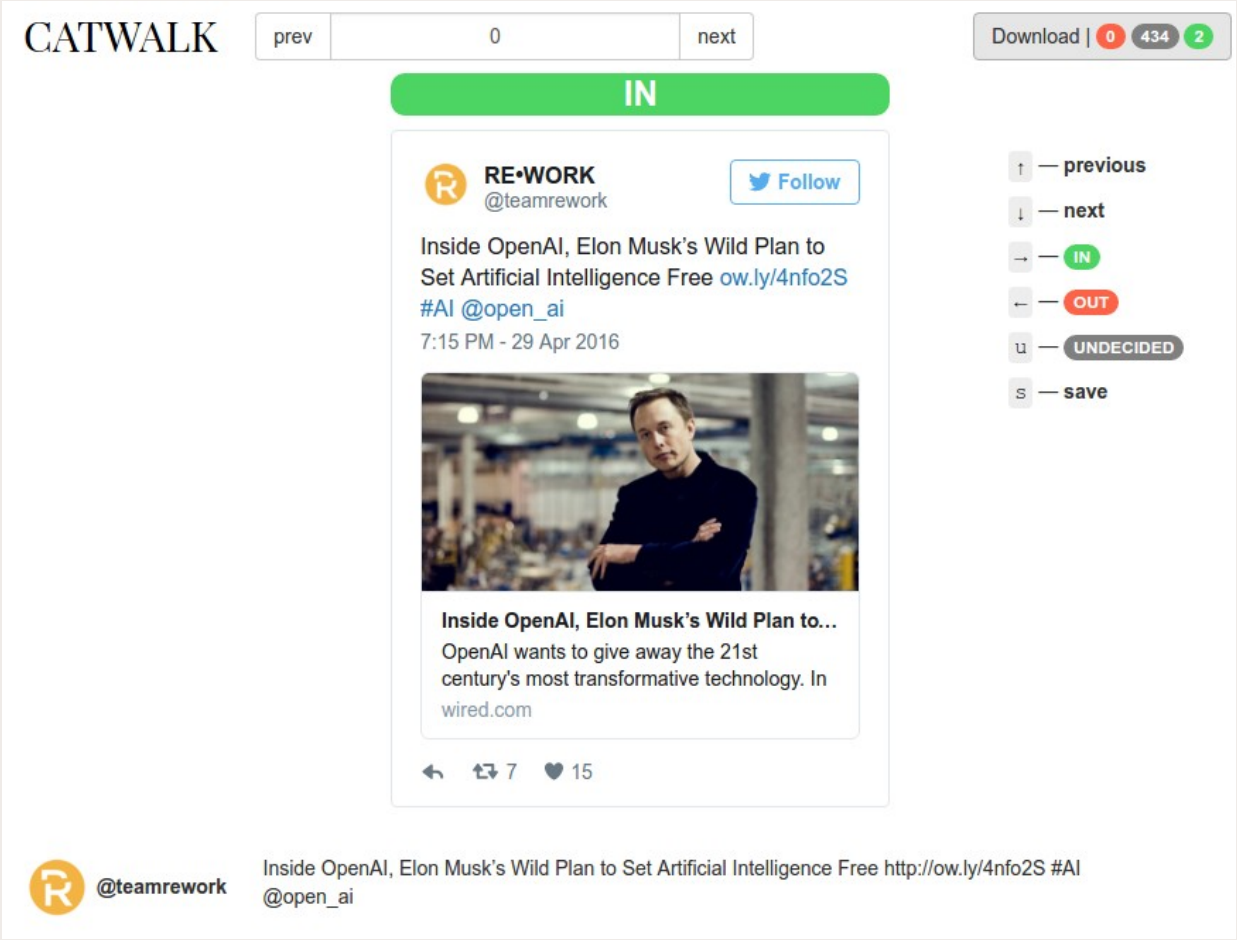
Graphe obtenu à partir d'un corpus de 60 millions de tweets citant des médias français

Explorer l'espace visuel d'un corpus

CatWalk : sélection qualitative de tweets

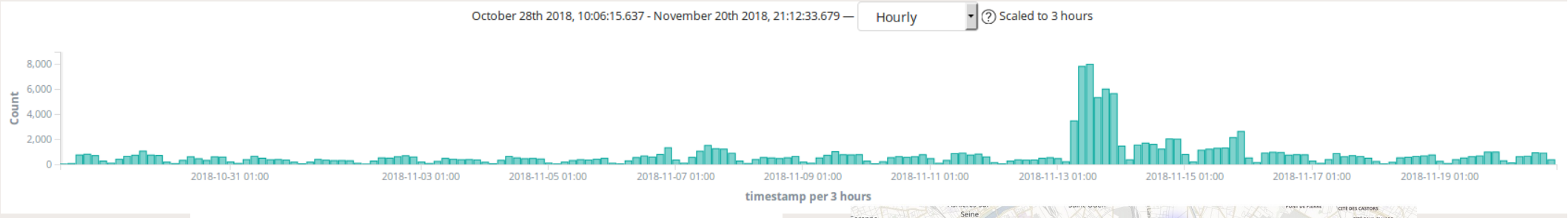
https://medialab.github.io/catwalk/

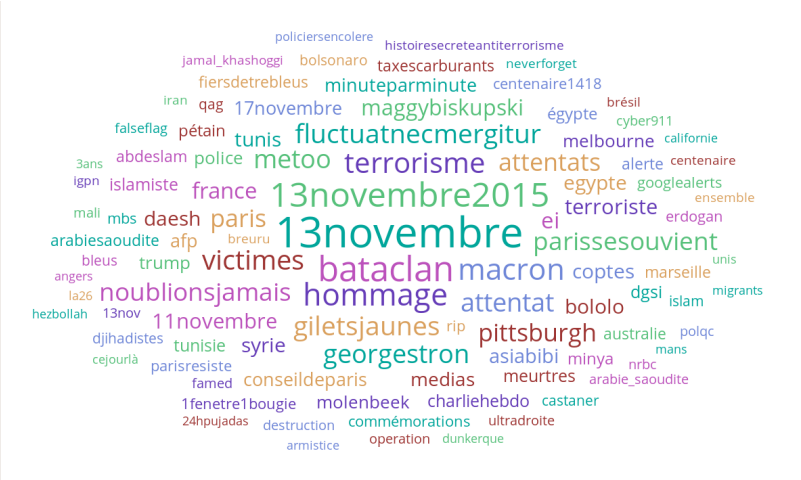
- Passer en revue rapidement « *à la Tinder* » tous les tweets d'un CSV pour décider de les inclure / exclure d'un corpus

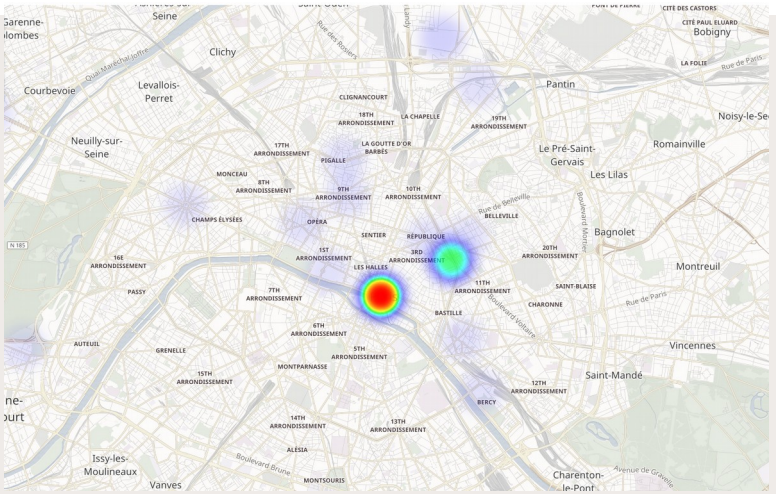


Perspectives futures

- 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

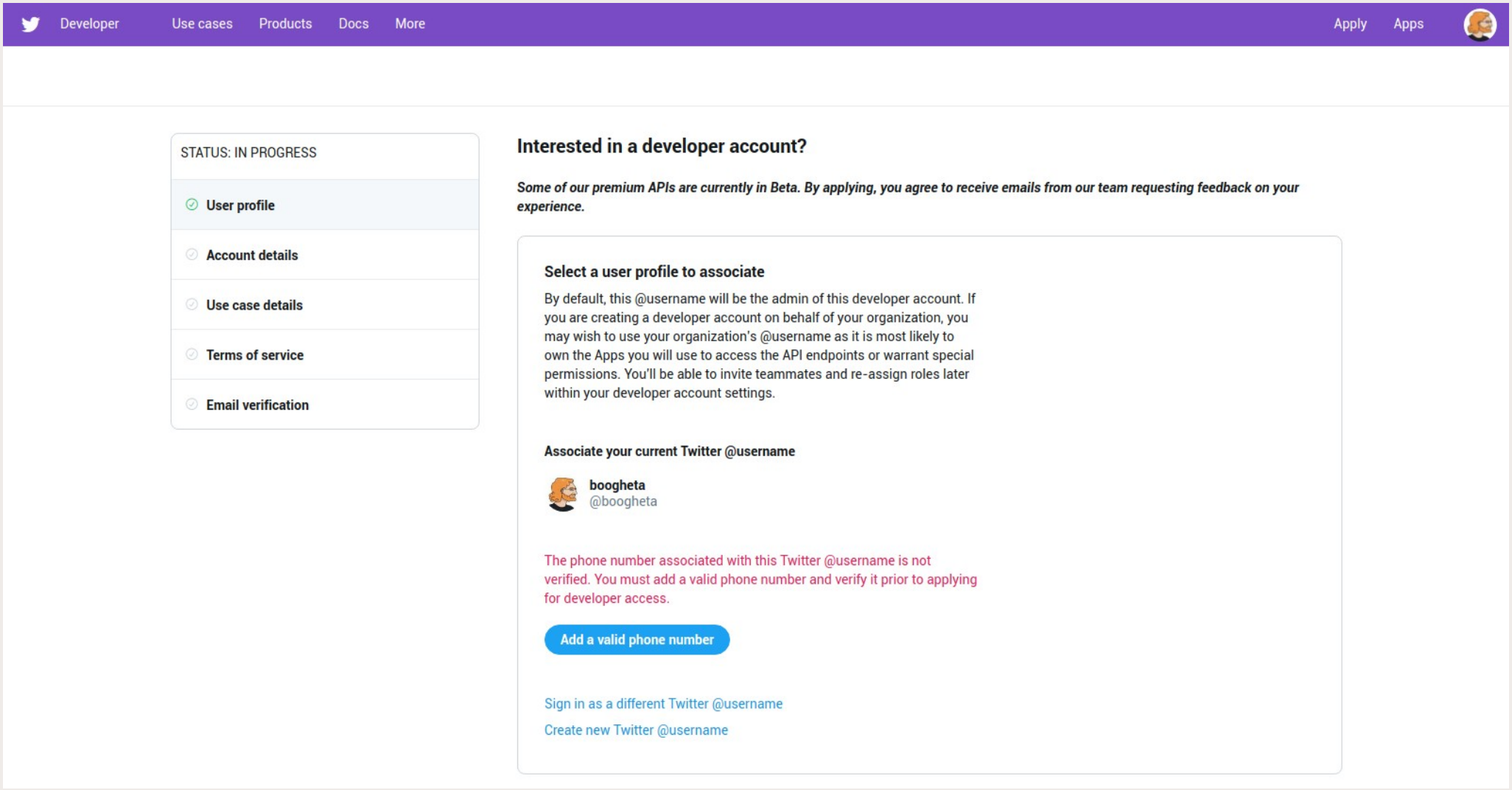
Questions?

benjamin.ooghe@sciencespo.fr

@boogheta **@medialab_ScPo**

Obtenir des clés d'API Twitter

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



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": "xxxxxxxxxxxxxxxxxxx",
        "secret": "xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx",
        "oauth_token": "xxxxxxxxx-xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx",
        "oauth_secret": "xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx"
    },
    "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 similarily 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.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
```