Mine it, mine all!

Digital methods for mining and measuring the spread of fact-checked claims on social media, featuring the open-source tools `minet` and `minall`

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26 February 2024

DE FACTO
Des clés pour mieux s'informer

Outline

De Facto Media Observatory

De Facto is France's EDMO hub, supported (2021-2023) by the following partners:

▶ AFP : fact-checkers
▶ médialab : researchers (my group!)
▶ CLEMI : media literacy
▶ XWiki : database / website

Fact-checkers contribute new reviews to the De Facto database almost every day. Every night, those reviews are enriched with up-to-date metrics.

Database Enrichment

The datbase's enrichment process includes the following:

- ▶ Research where the fact check was shared and how many people engaged with it online.
- ▶ Extract the content and metadata about appearances of the fact-checked claim.

Terminology Note: "fact check" > "fake news"

Not everything that is reviewed is determined to be fake. Sometimes fact checks confirm the truth of a claim. A "fact check" is not the same thing as "fake news."

Fact Checks : Key Terms

Fact-checkers **review** a **claim**, which made an **appearance** online.

The Review

> An article describing and evaluating the accuracy of a claim that someone made publicly.
Example: Politician Z claims X caused Y, which is not true.

The Claim

> A thesis asserting something about an event, a person, etc.
Example: X caused Y.

The Appearance

> The physical or digital material through which the claim was expressed and/or received by people.
Example: The video on YouTube of politician Z's public speech.

ClaimReview

In its database, the De Facto hub organizes this information using the international standard *ClaimReview*.

ClaimReview is part of *Schema.Org*, a set of vocabularies used to structure nested data. Founded by Google, Microsoft, Yahoo and Yandex, the *Schema.Org* vocabularies are managed by a community of developers and organize data all over the internet.

In example, let's organize data about the conference location:
- ▶ @type : *CollegeOrUniversity*
- ▶ Name: *University of Amsterdam*
- ▶ Logo:
  - ▶ @type : *ImageObject*
  - ▶ Width : 500
  - ▶ ContentUrl: https://www.uva.nl/binaries/...

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ClaimReview

The *ClaimReview* format organizes information about a fact check. Descending from the root, there are a few key branches.

- ▶ itemReviewed (`@type = "Claim"`)
    - ▶ **appearance** (e.g. `@type = "SocialMediaPosting"`)
        - ▶ url (e.g. `"url"`: `"https://twitter.com/USER/status/POST"`)
- ▶ author (e.g. `@type = "Organization"`)
- ▶ **reviewRating** (e.g. `@type = "Rating"`)
    - ▶ ratingValue (e.g. `2`)
    - ▶ alternateName (e.g. `Missing Context`)
- ▶ **claimReviewed** (e.g. *A photo of person A after event B.*)

ClaimReview

The **appearance** information can be very detailed.

- ► `"@type":  "SocialMediaPosting"`
- ► `"url":  "https://twitter.com/USER/status/POST"`
- ► `"interactionStatistic":`
    - ► `"interactionType":  "Share Action"`
    - ► `"interactionService"`
        - ► `@type:  "Website"`
        - ► `"name":  "Twitter"`
    - ► `"userInteractionCount":  2513`
- ► `"sharedContent":`
    - ► `"@type":  "ImageObject"`
    - ► `"contentURL":`
      `"https://pbs.twimg.com/media/IDENTIFIER.jpg"`
- ► `"text":` *[Text in the tweet, which accompanies the shared image.]*

Occasionally, we've needed to further develop the *ClaimReview* standard to better describe online appearances of claims.

For example, sometimes the types of ways users interact with the claim's online appearance are not among the types available in *ClaimReview*. We've created a new type, "Engagement."

```
"interactionStatistic":
  ▶ "interactionType":  "defacto:EngagementAction"
  ▶ "interactionService"
      ▶ @type:  "Website"
      ▶ "name":  "Reddit"
  ▶ "userInteractionCount":  17
```

Improving ClaimReview: New Creator Type

In *ClaimReview*, the author of an **appearance** ("*Creator*") can either be a person or an organization.

However, sometimes a social media account, especially a bot or an anonymous account, is ontologically neither a person nor an organization. Furthermore, accounts can have distinctive properties.

```
"creator":
```
- ▶ "@type": "defacto:SocialMediaAccount"
- ▶ "defacto:dateCreated": "2022-03-07T10:23:41"
- ▶ "identifier": "12345"
- ▶ "name": *Username*
- ▶ "interactionStatistic"
  - ▶ "interactionType": "FollowAction"
  - ▶ "interactionService"
    - ▶ @type: "Website"
    - ▶ "name": "Twitter"
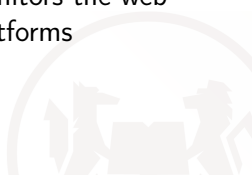 - ▶ "userInteractionCount": 21344

A *ClaimReview* includes one or more **appearances** of a **reviewed claim**.

The **appearance**, by virtue of being something seen online, includes a URL.

And we can do a lot with a URL!

▶ See where it came from (domain)

▶ Scrape its content

▶ Search for it in a database (Buzzsumo) that monitors the web and tracks when a URL appears on different platforms

With just a URL (and API keys), the open-source tool `minet`[1] can extract data from webpages, Facebook, Meta's CrowdTangle API, YouTube, Twitter, etc.

Knowing what type of URL you have (i.e. a YouTube link), you can call one of `minet`'s dedicated commands (i.e. `minet youtube`).

Challenge

When fact-checkers share *ClaimReviews* with the De Facto hub, they're combining URLs from all over the internet, requiring an undetermined variety of `minet` commands.

[1]https://github.com/medialab/minet

`minall`[2] - Mine all of it!

Challenge 1

Variety of URLs, requiring different data mining methods.

Solution

Interpret the needs of each URL and process it with the necessary `minet` commands, but in a batched and multi-threaded way.

Challenge 2

Things on the internet disappear. Update without data loss.

Solution

Accept a set of URLs **and** a previous iteration of enrichment. Using an in-memory SQL database, only update/overwrite the URL's metadata if the new data extraction was successful.

[2]https://github.com/medialab/minall

`minall` - Mine all of it!

See the tutorial online: https://medialab.github.io/minall/tutorials/

What we start with:

▶ API keys (get a YouTube API key for free from Google):

```
---
youtube:
    key: "XXXX"
```

▶ URLs from fact-checked claims

rating	url
True	www.online-news.eu/story
Missing Context	www.youtube.com/watch/video

▶ `config.yml` (API Configuration)

```
---
youtube:
    key: "XXXX"
```

▶ `data.csv` (URLs from fact-checked claims)

rating	url
True	www.online-news.eu/story
Missing Context	www.youtube.com/watch/video

```
minall --config config.yml --output-dir output/
       --links data.csv --url-col url
```

minall - Mine all of it!

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- ▶ Data fields we start with
  - ▶ url
- ▶ Data fields we end up with (selected columns)

- ▶ url
- ▶ date_published
- ▶ domain
- ▶ work_type
- ▶ duration
- ▶ identifier
- ▶ date_modified
- ▶ country_of_origin
- ▶ abstract
- ▶ keywords
- ▶ title
- ▶ text
- ▶ hashtags
- ▶ facebook_comment

- ▶ facebook_like
- ▶ facebook_share
- ▶ pinterest_share
- ▶ twitter_share
- ▶ twitter_like
- ▶ tiktok_share
- ▶ tiktok_comment
- ▶ reddit_engagement
- ▶ youtube_watch
- ▶ youtube_comment
- ▶ youtube_like
- ▶ youtube_favorite
- ▶ youtube_subscribe

title

- Data fields we start with
  - url
- Data fields we end up with (selected columns)

  - ...
  - creator_type
  - creator_date_created
  - creator_location_created
  - creator_identifier
  - creator_facebook_subscribe
  - creator_facebook_follow
  - creator_twitter_follow
  - creator_youtube_subscribe
  - creator_create_video
  - creator_name
  - creator_url
  - create_video

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By extracting counts of likes and followers, we can explore possible correlations between the size of a user's account and the number of likes their posts get on different platforms in our database.

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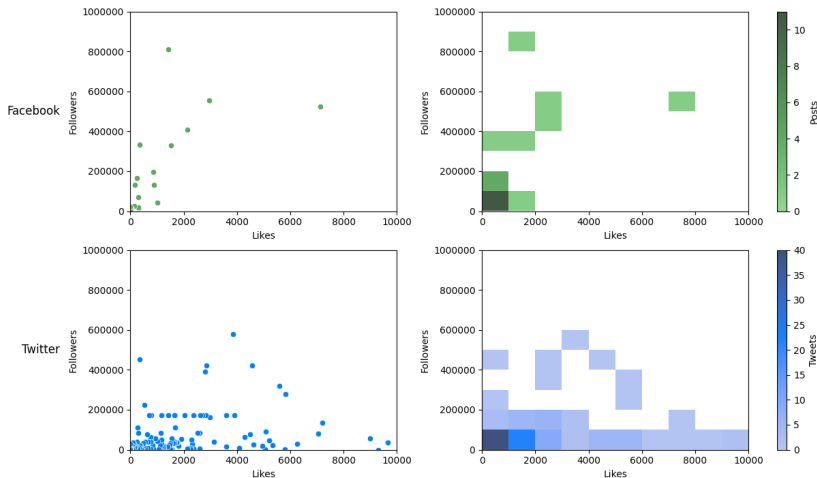
We can also combine discrete and categorical data. For example, we can examine how many of an account's followers liked a post when it was rated false (1, magenta) or partly false (2, violet).
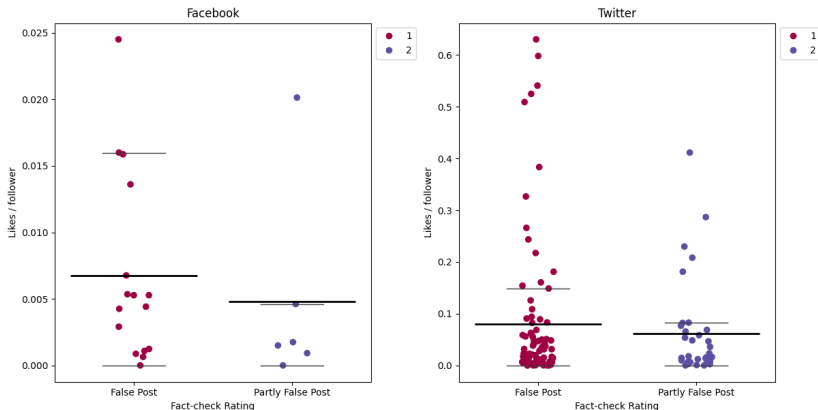
[3]For Twitter dataset, when likes / follower > 0.9, the outlier was removed. Removed 4 outliers.

What we can do with the new info

Finally, we can explore the text data that we extracted from various parts of the fact-checked URLs' web content.

Tweet: Post

Coup d'Etat: Macky Sall, marionnette de Macron , annule les élections au Sénégal...

Webpage: Article Text

... Darmanin, le « chouchou » de Macron à quitte ou double...

YouTube Video: Keywords

Emmanuel Macron, Président République Française , France, Elysée, Présidence

Conclusions

1. We start with what the fact-checkers provide, URLs.
2. We jump from those URLs into the internet, to extract the content and discover the links' circulation and engagement online.
   - ▶ Through an automated and free (GitHub CI) processs, we update our enriched *ClaimReviews* every day.
3. We aggregate that new information and try to better understand the nature of fact-checked content online.

All of this enrichment is free to do (minus the cost of API keys). The tools are transparent and published in public repositories on GitHub.[4]

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[4]https://github.com/medialab/minet, https://github.com/medialab/minall, https://github.com/medialab/defacto-enrichment-public