Coping with GDPR in Social Media Research

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GDPR: General Data Protection Regulation.

Regulation (EU) 2016/679 on the protection of natural persons with regard to the processing of their personal data

Personal data: Any information related to an identified or identifiable individual (the *data subject*)

- Personal data is pervasive in social media
- We will use Twitter as an example
- All Social Media platforms share similar situations

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What's in a Tweet?

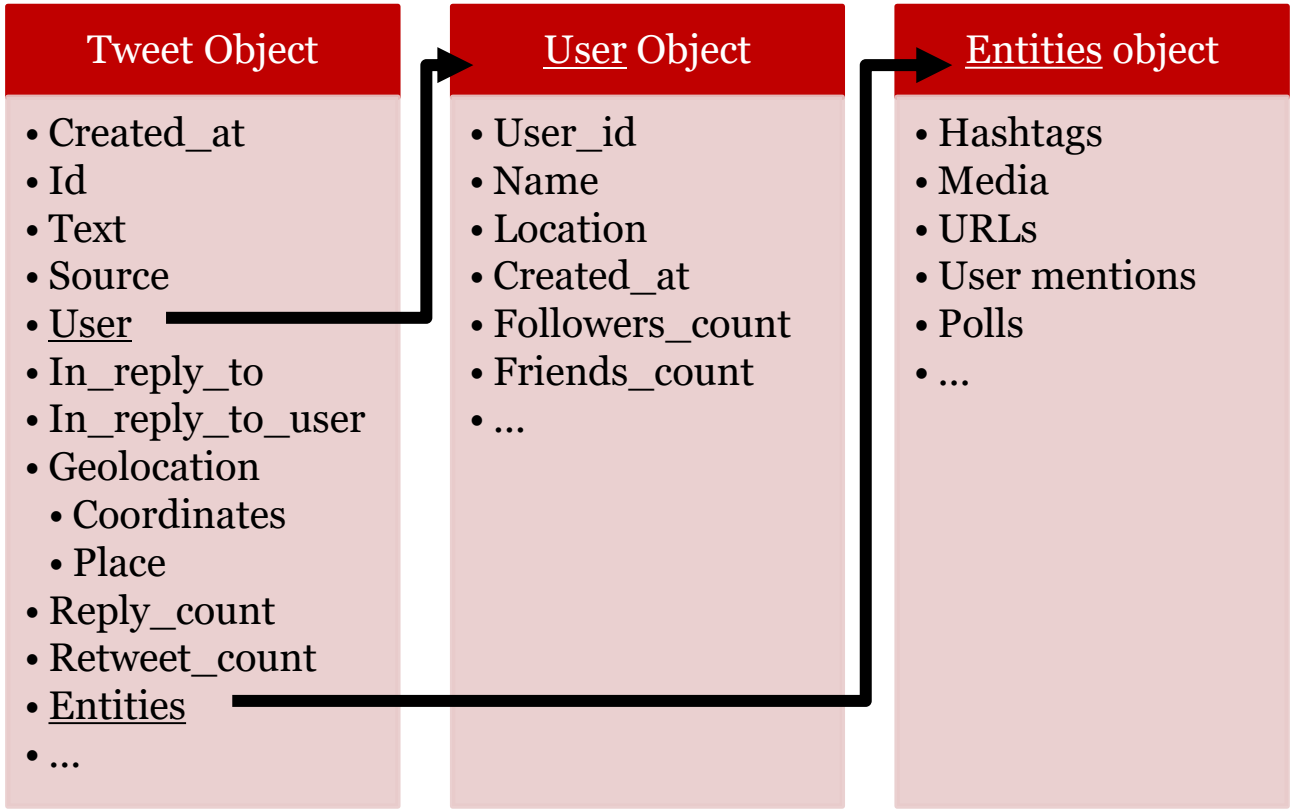
Twitter API v2 data dictionary

Tweet Object

- Created_at
- Id
- Text
- Source
- User
- In_reply_to
- In_reply_to_user
- Geolocation
  - Coordinates
  - Place
- Reply_count
- Retweet_count
- Entities
- ...

What's in a Tweet?

Twitter API v2 data dictionary



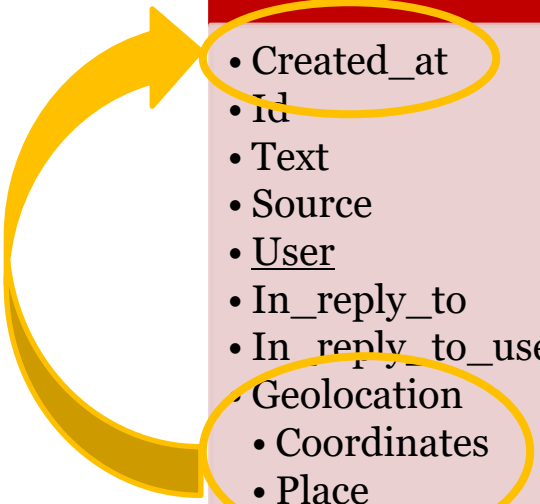
What's in a Tweet?

Data related to identified data subjects

Tweet Object	User Object	Entities object

• Created_at
• Id
• Text
• Source
• User
• In_reply_to
• In_reply_to_user
• Geolocation
  • Coordinates
  • Place
• Reply_count
• Retweet_count
• Entities
• …
	• User_id
	• User_Name
	• Location
	• Created_at
	• Followers_count
	• Friends_count
	• …
		• Hashtags
		• Media
		• URLs
		• User mentions
		• Polls
		• …

What's in a Tweet?



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  - Coordinates
  - Place
- Reply_count
- Retweet_count
- Entities
- …

User Object

- User_id
- Name
- Location
- Created_at
- Followers_count
- Friends_count
- …

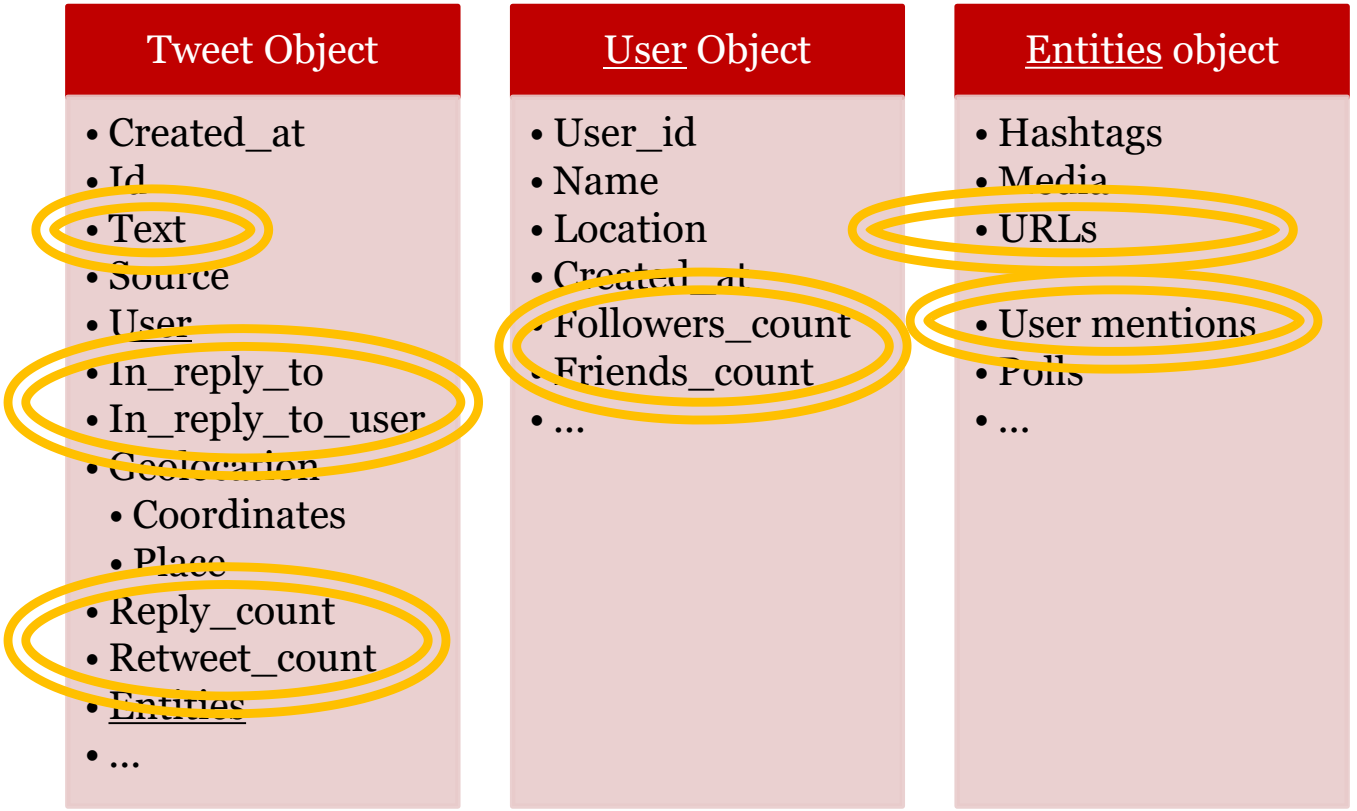
Entities object

- Hashtags
- Media
- URLs
- User mentions
- Polls
- …

Data related to identifiable data subjects

What's in a Tweet?

Data profiling data subjects (affinities, habits, ideology…)



GDPR stipulates that any processing of personal data shall be grounded in one of 6 possible legal bases.

In the vast majority of cases the legal basis for processing personal data in a research project is data subjects' consent

So, what can we do to conduct research with personal data extracted from social media networks?

1) If possible, seek users' consent to process their data
2) If not possible, anonymise the data prior to their storage and processing

Anonymisation: application of a process to personal data so the link to the data subject is permanently removed

GDPR is not applicable to anonymised data

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- The rest of this presentation is about techniques to anonymise data collected from social media

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Coping with text

Tweet Object	User Object	Entities object

• Created_at
• Id
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• User
• In_reply_to
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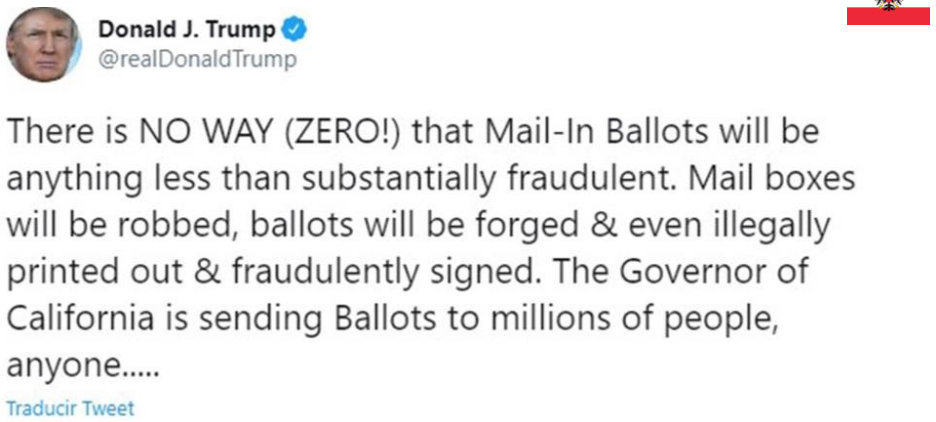
• Geolocation
  • Coordinates
  • Place
• Reply_count
• Retweet_count
• Entities
• …
	• User_id
	• User_Name
	• Location
	• Created_at
	• Followers_count
	• Friends_count
	• …
		• Hashtags
		• Media
		• URLs
		• User mentions
		• Polls
		• …

Coping with text

1. Keyword extraction

INPUT



OUTPUT

ballots | anyone | mail | governor | anything

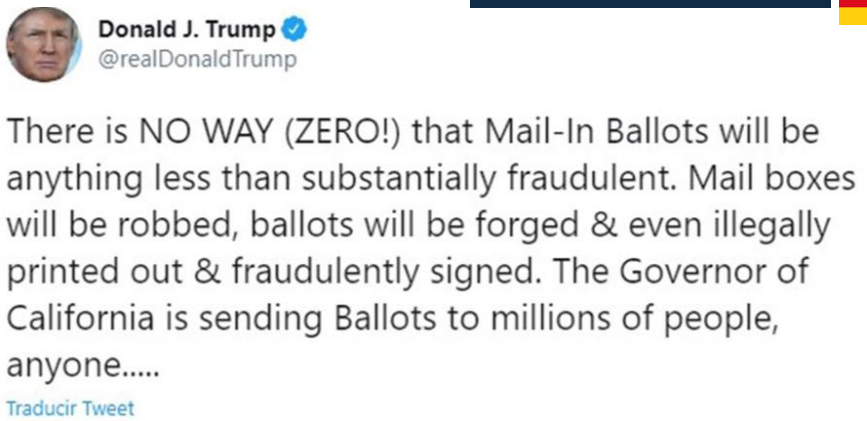
boxes | milions | matter | california

https://www.cortical.io/freetools/extract-keywords

Coping with text

2. Translation

INPUT



OUTPUT

No hay ninguna posibilidad (¡cero!) de que los votos por correo sean algo menos que sustancialmente fraudulentos. Los buzones serán robados, las papeletas serán falsificadas e incluso impresas ilegalmente y firmadas fraudulentamente. El Gobernador de California está enviando papeletas a millones de personas, cualquier persona...

https://www.DeepL.com/Translator

Coping with text

3. Other tricks

Remove empty words (with no lexical meaning)	*Mail boxes ~~will be~~ robbed, ballots ~~will be~~ forged ~~& even~~ illegally printed out ~~&~~ fraudulently signed.*
Remove direct identifiers	*~~The Governor of California is~~ sending ballots to millions of people*
Replace derivative words with their root form	*ballots → ballot* *will be → be* *fraudulent → fraud*
Replace words with a synonym	*NO alternative ZERO Mail-In Ballots is anything less substantially dishonest.*
Use a combination of techniques	**Best results always obtained using a combination of techniques!!!**

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Coping with images

Tweet Object	User Object	Entities object

• Created_at
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• In_reply_to_user
• Geolocation
  • Coordinates
  • Place
• Reply_count
• Retweet_count
• Entities
• …
	• User_id
	• User_Name
	• Location
	• Created_at
	• Followers_count
	• Friends_count
	• …
		• Hashtags
		• Media
		• URLs
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		• Polls
		• …

Coping with images

imagga

https://docs.imagga.com/#getting-started-request

Semantic extraction


```
{ "result":
{
  "tags": [
   {
    "confidence": 61.4116096496582,
    "tag": {
     "en": "mountain"
    }
   },
   {
    "confidence": 54.3507270812988,
    "tag": {
     "en": "landscape"
    }
   },
   {
    "confidence": 50.969783782959,
    "tag": {
     "en": "mountains"
    }
   },
   {
    "confidence": 46.1385192871094,
    "tag": {
     "en": "wall"
    }
   },
   {
    "confidence": 16.6996059417725,
    "tag": {
     "en": "lake"
    }
   },
   {
    "confidence": 16.6136302947998,
    "tag": {
     "en": "cliff"
    }
   },
   {
    "confidence": 16.5426540374756,
    "tag": {
     "en": "geology"
    }
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    "tag": {
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    }
   },
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    "tag": {
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    }
   },
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    "confidence": 8.87552165985107,
    "tag": {
     "en": "peaks"
    }
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    "confidence": 8.81966876983643,
    "tag": {
     "en": "alpine"
    }
   },
   {
    "confidence": 8.80224514007568,
    "tag": {
     "en": "mount"
    }
   },
   {
    "confidence": 8.73800754547119,
```

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Coping with dates and numbers

Tweet Object	User Object	Entities object
• Created_at • Id • Text • Source • User • In_reply_to • In_reply_to_user • Geolocation • Coordinates • Place • Reply_count • Retweet_count • Entities • …	• User_id • User_Name • Location • Created_at • Followers_count • Friends_count • …	• Hashtags • Media • URLs • User mentions • Polls • …

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Coping with dates and numbers

Anonymization by aggregation	*Use statistical values (mode, median, standard deviation..) instead of keeping individual figures.*
Adding white noise (random number)	*Add X, X ~U(-a , a) to each individual figure, so statistical properties of the sample will not change.*
Use of hash algorithms	*Hash algorithms are susceptible to brute force attacks.* *'Salted' hash minimizes the issue.*
Remove a random number of samples	*If there is certainty that an element is in the sample, it is easier to find.*
Use data in ranges	*E.g., if you have to process account creation date, use ["< one year old", "between 1 and 5", "more than 5 y.o."]*
Always perform a reidentification test	*Best results if reidentification test is conducted by a colleague*

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To sum up:

- If you make use of personal data extracted from social media for your research:
  1. Seek users' consent, if possible
  2. Anonymise the data by adapting the ideas expressed in this presentation to your research and
     - Do not store interim personal data
       - Anonymisation shall be conducted 'on the fly'
       - If you need to recreate the dataset, re-run the process
  3. Always seek certification by a research ethics committee
     - Research with social media data is an evolving topic
     - Ideas expressed in this presentation may change in the future


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GDPR stipulates that any processing of personal data shall be grounded in one of 6 possible legal bases.

In the vast majority of cases the legal basis for processing personal data in a research project is data subjects' consent. But GDPR provides extra room for the so called 'further processing': when personal data is used for a processing different than the one for which data was collected

Considerations when further processing of personal data (GDPR's art. 6.4)

Social Media users posted their personal data for a purpose, researchers 'further process' that data for a different purpose (research)

1) Linking between initial purpose and intended further processing
2) Context in which the personal data was collected
3) Nature of personal data (special categories of PD, profiling data…)
4) Possible consequences of the further processing
5) Existence of appropriate safeguards