ORMA: A Semi-automatic Tool for Online Reputation Monitoring in Twitter

Abstract

We present a **semi-automatic tool** that assists experts in their daily work of monitoring the **reputation of entities** — companies, organizations or public figures — in **Twitter**. The tool **automatically annotates** tweets for **relevance** (*Is the tweet about the entity?*), **reputational polarity** (*Does the tweet convey positive or negative implications for the reputation of the entity?*), groups tweets in **topics** and display **topics in decreasing order of relevance** from a reputational perspective. The interface helps the user to understand the content being analyzed and also to produce a manually annotated version of the data starting from the output of the automatic annotation processes. A **demo** is available at: **http://nlp.uned.es/orma/**

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Online Reputation Monitoring

Tasks

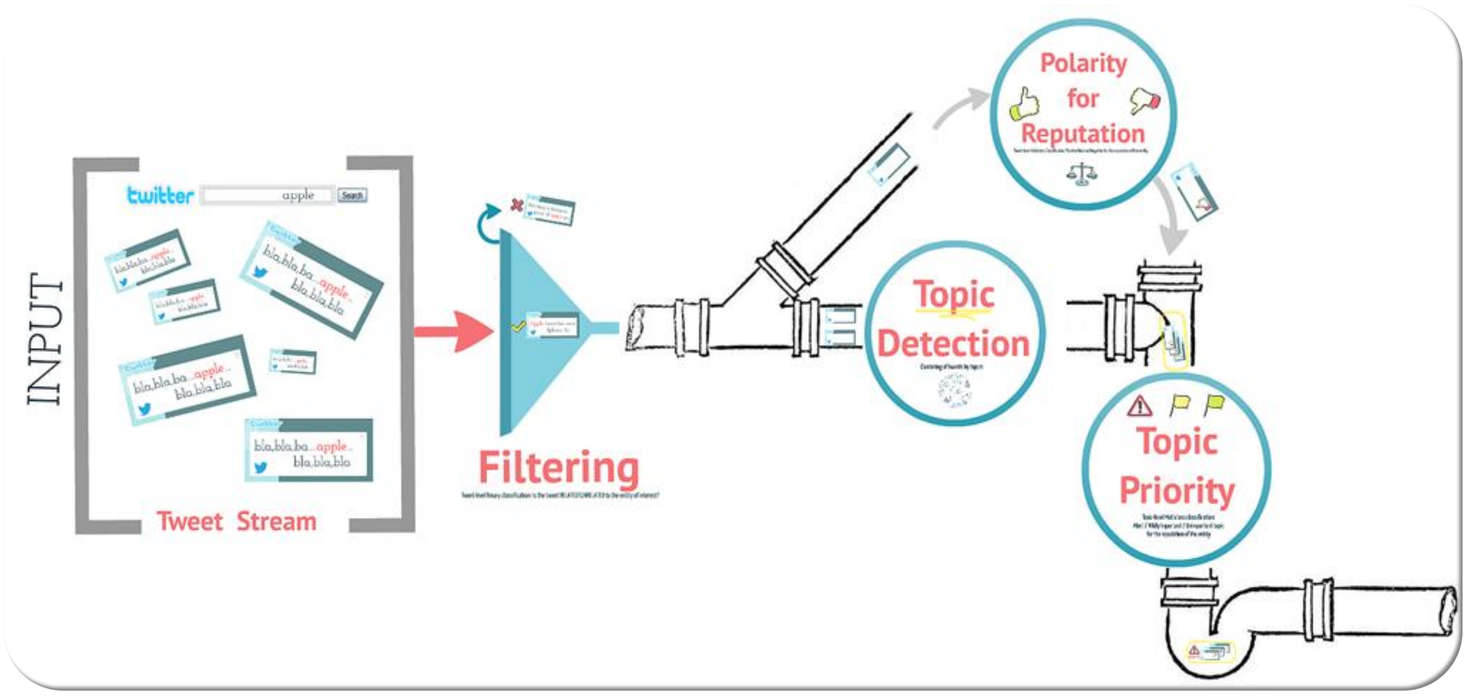
The rise of social media brought serious concerns to companies, organizations, and public figures on what is said about them online. **Monitoring online reputation** has therefore become a **necessity**. Given a stream of texts containing a potential mention to a company as input, an online reputation analyst typically has to perform at least the **following tasks**:

1. **Filtering** out tweets that are not related to the entity of interest.
2. Determining the **polarity** (positive, neutral or negative) of the related tweets.
3. Clustering the strongly related tweets in **topics**.
4. Assigning a relative **priority** to the clusters, in terms of whether a topic may damage the reputation of the entity.

Process

The process starts selecting one of the entities assigned to the expert. In the system, each entity has a list of tweets that the expert has to annotate manually. The expert processes tweets sequentially:

1. First, she decides whether the tweet does **refer to the entity of interest** or not. If the tweet is **unrelated to the entity**, **the annotation process** for the tweet **finishes** and the expert continues with the next tweet in the list. Otherwise, the polarity and topic annotations follow.
2. **Polarity** annotation consists in deciding whether the tweet may affect **positively or negatively to the reputation of the entity**.
3. **Topic annotation** consists of **identifying** the aspects and **events** related to the entity that the tweet refers to. If the tweet refers to an already identified topic, the tweet is assigned to it.
4. Otherwise, the expert defines a **new topic**. A topic receives a **label** that summarizes what the topic is about, and it is also classified in a **priority** scale (Alert, Medium or Low in our tool).
5. When the **tweet is assigned to a topic**, the annotation of the current tweet is **finished**.



What if we suggest automatic labels to the analyst?

Automatic Mode

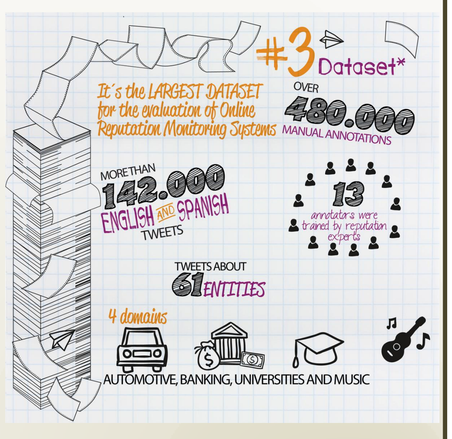
In this work we propose a **user oriented web interface** that allows the experts to easily visualize and work with the data to be analyzed. The system also **proposes different automatic labels** for each input data with a **confidence score** indicating the **degree of certainty** of such labels. The tweets are processed using different approaches presented in previous RepLab campaigns:

1. **Filtering**: Bag-of-Words classifier (SVM) trained at entity-level.
2. **Polarity**: Borda count combination of different approaches presented at RepLab 2013.
3. **Topic Detection**: Hierarchical Agglomerative Clustering of semanticized tweets using Wikipedia.
4. **Priority**: Instance-based Learning which uses Jaccard's word similarity.

Preliminary Results

Usability

An earlier version of the ORMA annotation application (which did not include the option to automatically process the data) has been tested by **13 experts** along the preparation of the **RepLab 2013** test collection.



Evaluation: time efficiency

- **Manual spreadsheet**: an annotator labeled **250 tweets** from an entity with a **spreadsheet** (commonly used in consultancy firms)
- **Manual ORMA**: an annotator labeled **250 different tweets** of the same company using the demo **without proposing automatic labels**
- **Semi-automatic ORMA**: two annotators **labeled 250 different tweets** of the same company using **automatic labels**

	Manual Spreadsheet	Manual ORMA	Semi-automatic ORMA	
			Annotator 1	Annotator 2
Time	6h : 47m	5h : 14m	3h:00m	3h:00m
Improvement		**23%**	**43%**	**43%**