



Information Credibility Evaluation on Social Media

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Background

Nowadays, online social media, such as Facebook, Twitter and Sina Weibo, is developing rapidly all over the world. Users can share information and publish their comments on the Internet. On these platforms, information can be generated and spread more rapidly, while rumors or misinformation can also be spread and viewed by more people. Rumors are showing their harm on our daily life or even public security. Up to February 1st, 2016, on China's biggest microblog website Sina Weibo, 29250 rumors have been reported and collected on its misinformation management center. Accordingly, it is crucial and urgent to evaluate the credibility of information and detect the rumors on social media.

Model

We construct a NICE system for evaluating information credibility on social media. In our model, we can learn event representation as:

$$\mathbf{r}^{e_i} = \frac{1}{n_{e_i}} \sum_{m_j^{e_i} \in M^{e_i}} (\mathbf{T}_j^{e_i} + \mathbf{C}_j^{e_i} + \mathbf{B}_j^{e_i}) \mathbf{u}_j^{e_i}$$

- e_i —— an event spreading on social media.
- n_{e_i} —— the total number of messages of the event.
- $m_j^{e_i}$ —— a specific message of the event.
- $\mathbf{u}_j^{e_i}$ —— the latent vector of the corresponding user.
- $\mathbf{B}_j^{e_i}$ —— the operating matrix of the user's behavior.
- $\mathbf{C}_j^{e_i}$ —— the operating matrix of the user's comment opinion.
- $\mathbf{T}_j^{e_i}$ —— the operating matrix of the time interval since the beginning of the event.

Prediction of rumor or non-rumor via a logistic regression:

$$y^{e_i} = \frac{1}{1 + e^{-\mathbf{w}^T \mathbf{r}^{e_i}}}$$

Contact

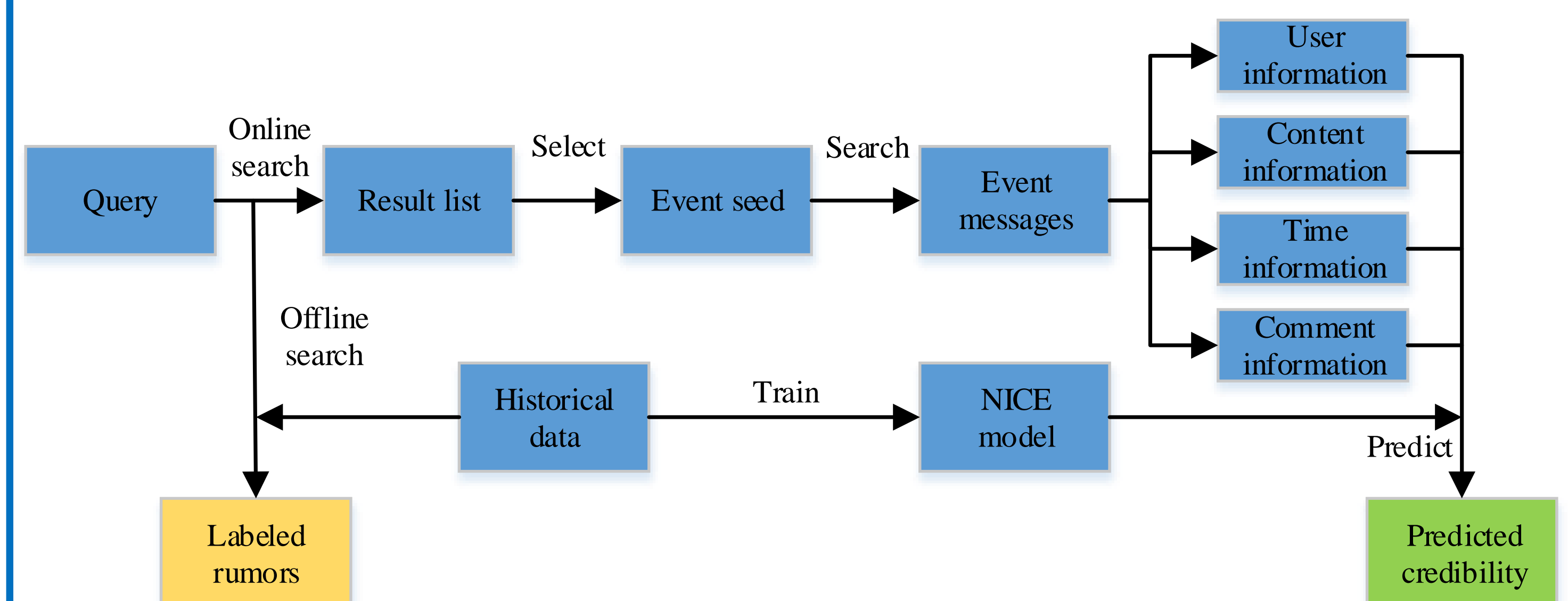
Homepages:



Wechat:



NICE System



Dataset

#events	#rumors	#non-rumors	#microblogs	#postings	#repostings	#users
936	500	436	630363	98429	532236	321246

We constructed a database containing rumors and non-rumors from Sina Weibo. To crawl rumors, we first collected some rumor seeds from misinformation management center of Sina Weibo, then extracted key words from the rumor seeds and retrieved microblogs based on these key words. We crawled all the matching microblogs, and for each microblog, we collected its reposts, comments, dynamic information and the corresponding user's profile. To crawl non-rumors, we collected some hot topics on Sina Weibo and used similar process of crawling rumors to collect corresponding information. Finally, this database contains the verified rumors and non-rumors, which are used to train our model.

Experimental Comparison

Methods	Accuracy	Precision	Rumors		Non-rumors		
			Recall	F1-score	Precision	Recall	F1-score
NewsCP [1]	0.758	0.741	0.808	0.773	0.728	0.770	0.749
EP [2]	0.812	0.795	0.899	0.844	0.802	0.793	0.798
ours	0.887	0.831	0.990	0.903	0.946	0.805	0.870

[1] News credibility evaluation on microblog with a hierarchical propagation model. In ICDM 2014.

[2] Enquiring minds: Early detection of rumors in social media from enquiry posts. In WWW 2015.

Demonstrations

