Twitter Rumour Detection for Health

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INTRODUCTION

Nowadays information diffusion has become more and more immediate and fast thanks to social media and its services. However, lack of controls in resources as social microblogs often leads to spread unverified information, such as rumours, becoming a threat to the society. To improve life quality and good information diffusion, in this work, we direct our efforts towards the challenging scenario of rumour detection at level of each single post considering health-related news.

KEYWORDS

Health rumour detection, Cross-topic, Social microblog, Twitter, Network- and User-based Features

1 BACKGROUND AND MOTIVATIONS

In the last years social networks have emerged as a critical mean for information spreading However, unverified and instrumentally relevant information statements in circulation, named as rumours, are becoming a potential threat to the society [2]. For this reason, although the identification in social microblogs of which topic is a rumour has been studied in several works, there is the need to detect if a post is either a rumour or not [1, 3–7]. Indeed, being able to detect rumour at level of a single post can be very, and even more, useful in many applications: first of all in the health care and wellness where it is often possible to find rumour and non-rumour information belonging to the same conversation or topic. In particular, information management in health field could have a great impact improving life quality and style of those people that rely on health knowledge found online, especially in social microblogs, which allow a faster and broader diffusion of news.

2 MATERIALS AND METHODS

We coped with the aforementioned challenge developing a novel rumour detection system, shown in figure 1, that leverages on newly designed features, including influence potential and network characteristics measures. First, the system acquires the data from Twitter, then it reconstructs the diffusion networks of each post, leading to the extraction of representative features, e.g. the probability of a tweet of being retweeted, measuring the influence power of that information, or graph-related measure that highlight the network structures. These are evaluated and selected to build the final classifier. We tested our approach on two real datasets composed of more than 2000 posts collected from Twitter microblog, considering two health-related topics, i.e. Zika virus and Vaccines. Here two examples from the #Zikavirus dataset: a rumour "*RT @ClassicPict: Mosquitoes kill more annually than Sharks. #ZikaVirus*" and a non-rumour "*RT @WHO is dispelling rumours around Zika & microcephaly. See the facts about #ZikaVirus: http://goo.gl/JDKuys*".

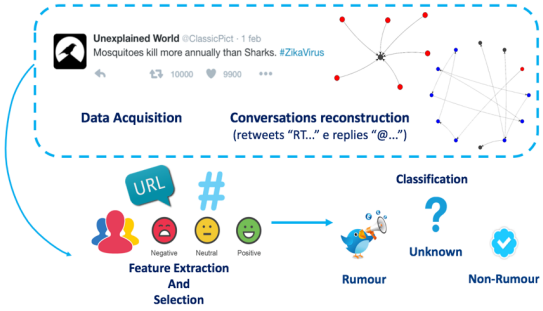

Figure 1: Pipeline of the rumour detection process.

3 RESULTS AND CONCLUSIONS

We observed promising results, as the system is able to correctly detect more than the 90% of rumours, with acceptable levels of precision (ranging from 78% to 96%). Hence, this experimental study on real datasets demonstrated the effectiveness of this system and new features, paving the road to health-related rumour detection systems development, whose application could have great impact in health information diffusion management. Future work could be directed towards two main directions: the application of this system in different test cases, aiming at real time detection, and the study of transfer learning between different topics datasets.

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