

Chapter 37

Efficient Large-Scale Stance Detection in Tweets

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ABSTRACT

Stance detection is an important research direction which attempts to automatically determine the attitude (positive, negative, or neutral) of the author of text (such as tweets), towards a target. Nowadays, a number of frameworks have been proposed using deep learning techniques that show promising results in application domains such as automatic speech recognition and computer vision, as well as natural language processing (NLP). This article shows a novel deep learning-based fast stance detection framework in bipolar affinities on Twitter. It is noted that millions of tweets regarding Clinton and Trump were produced per day on Twitter during the 2016 United States presidential election campaign, and thus it is used as a test use case because of its significant and unique counter-factual properties. In addition, stance detection can be utilized to imply the political tendency of the general public. Experimental results show that the proposed framework achieves high accuracy results when compared to several existing stance detection methods.

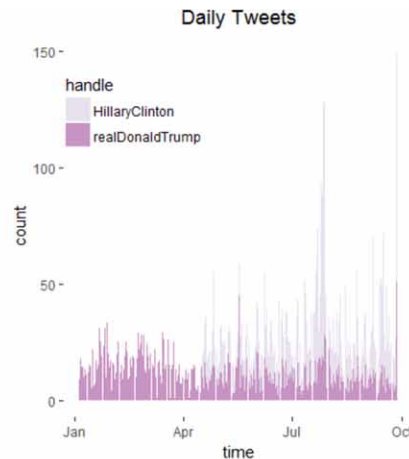
1. INTRODUCTION

There has been a major growth in the use of multimedia data on the Internet in the past decade, especially the microblogging platforms. Microblogs, such as Twitter, Tumblr, Weibo, and Facebook, allow users to exchange small contents including images, short videos, as well as comments. Some previous research efforts were paid on these kinds of multimedia data (Yan et al., 2016; Chen, Hsieh, Yan, & Chen, 2015;

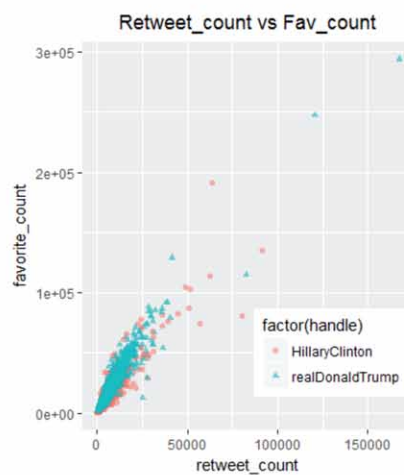
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Meng et al., 2014; Yan et al., 2014; Chen, Zhu, Lin, & Shyu, 2013; Lin, Chen, Shyu, & Chen, 2011; Zhu, Lin, Shyu, & Chen, 2011; Lin & Shyu, 2010; Chen, Rubin, Shyu, & Zhang, 2006; Chen, Shyu, & Kashyap, 2000). Twitter is one of the most widely used microblog platforms nowadays. As with traditional blogging, Twitter users ranging from regular users to politicians, celebrities, and company representatives post and interact with messages ranging from simple to the thematic post (known as “tweets”). As a result, it is possible to collect tweets of users from different social and interested groups for commercial or academic proposes. In 2016, the battle on Twitter was an integral part of a prearranged effort to disturb the past U.S. presidential election. To visualize the overall picture, Figure 1(a) presents the daily tweet counts between Hillary Clinton and Donald Trump for the election time period in 2016; while the popularity measure between the two candidates is shown in Figure 1(b) by mapping the retweet and favorite counts of the two candidates.

Figure 1. Daily tweets versus retweet and favorite counts



(a) Daily tweets of the two candidates



(b) Popularity vs following measure of all supporters grouped by their candidates

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