Online Mental Illness Detection Based on Continual Tweets Using Decision Trees

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Abstract: A remarkable growth is observed in social network sites in the past decade, and they are moving upwards with technology and user-friendliness to communicate, share and interact with common interests as an information-sharing platform. Twitter is one of the top-ranked social network websites with more than 100 million users with an average of 330 million postings[1] and about 1.6 billion search queries per day. These tweets posted over the social networks hold important information related to mental health of an individual. Researchers used machine learning methods to extract the useful information from tweets and identify the early mental health problems[2, 3]. The tweets-based categorization method is different from traditional questionnaire-based methods [4-9].

Using the words associated with Kessler's questionnaire[10], we extracted the tweets to depict the significant information connected to mental health status. The tweeting pattern of these Kessler's associated words is analyzed. Decision Tree classification exhibited a different pattern in 'nervous' to other Kessler's words. Repetitive tweets in shorter (1, 2, 5, <24 hours) and longer (> 24 hours) interval were analyzed. Few Kessler's word tweets observed more than once in a day and out of these tweets many are in a span of two-hours itself. We computed the TF x IDF factor[11] to find the word importance in the tweet-corpus and found that '#nervous' tag had behaved differently. Since the Kessler's associated words have direct imprint from mental health of an individual, our analysis benefits in projects that develop mental health illness detection at early stages that can be used on a suicide prevention platform.

Cases perceived through the above process are to be considered with greater care for detecting the mental illness. The automatic re-tweeting process should be in place with the social network sites to establish the score of the individual for mental illness detection. Text mining studies from the tweets of earlier mental health patients will also improve the individual mental illness detection. Studies can also be extended to use the tweets related to the drugs that used in the remedial process. The results obtained from these social network sites detect the individuals with mental illness and allow to raise a flag to apprise family, friends and nearest mental health specialist for adequate care and remedial process in a real-time manner.

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