

MACHINE LEARNING OF TWITTER FEEDS AND WOMEN SAFETY IN INDIAN CITIES

S. Gokulakrishnan

Department of CSE, Sri Chandrasekharendra Saraswathi Viswa Mahavidyalaya, Kanchipuram, India
Email: s.gokulakrishnan@kanchiuniv.ac.in

Chitte Ashok Reddy, Palutla Venkata Sai Anudeep

Department of CSE, Sri Chandrasekharendra Saraswathi Viswa Mahavidyalaya, Kanchipuram, India

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ABSTRACT

Background: Women and girls in Indian cities increasingly post about harassment and unsafe situations on Twitter, generating large volumes of tweets whose analysis calls for automated methods.

Objective: This paper examines the role of Twitter feeds in assessing the safety of women and girls in Indian cities using machine learning algorithms.

Methods: A dataset of tweets on women's safety was cleaned with NLTK and analyzed with the TextBlob package and a sentiment dictionary, which count positive, negative, and neutral polarity.

Results: Of 15,054 tweets analyzed, 74.6% expressed negative sentiment, 22.3% neutral, and 3.1% positive, so that about 74% of the location can be confirmed unsafe for women.

Conclusion: Machine learning algorithms help organize and analyze Twitter data, including millions of daily tweets and messages, and the same approach can be extended to other social media platforms.

Keywords: Accuracy, Harassment, Sarcasm, Emoticons

HIGHLIGHTS:

1. A simple machine learning algorithm helps analyze tweet feeds concerning girls' safety.

INTRODUCTION

Women and girls sometimes face unsafe situations or harassment, and nowadays they most often post about it on Twitter. Analysis of collections of Twitter text helps in understanding harassment and amoral behaviour directed at women in Indian cities [1].

Machine learning algorithms help organize and analyze Twitter data, including the millions of tweets and messages posted daily. This paper applies machine learning-based sentiment analysis to tweets on women's safety to determine whether a location is safe for women.

MATERIALS AND METHODS

Sentiment Analysis Procedure

Tweets are analyzed using the following methodology:

1. Download the sentiment dictionary.
2. Download the Twitter test datasets and supply them as input to the program.
3. Clean the tweets by removing stop words and repeated letters.
4. Tokenize each word, assign a strength to the words within the dataset, and feed it to the program.
5. Compare each word with the positive and negative sentiment word dictionaries, and increment the positive or negative count of the phrase accordingly.
6. From the positive and negative counts, compute the sentiment percentage and finalize the polarity as Positive, Negative, or Neutral.

Keyword Filters and Sentiment Classification

Tweets are monitored and verified using sentiment analysis of user data, so that the administrator can check each user's tweets to ensure women's safety on social networking sites such as Twitter and Instagram. The tweets produced by each application user form the dataset, and text-analysis graphs can be displayed.

The administrator stores filters in the database. Filters are keywords searched for in the tweet content to determine whether it is abusive. Two types of filters are used: positive keywords, which are not abusive to women in any way, and negative keywords, which women would find offensive. Positive and negative keywords can be stored in any combination. Each keyword in the database is compared against the user's tweet: a tweet containing at least one positive keyword is categorized as positive sentiment, and a tweet in which a negative keyword is identified is categorized as negative sentiment.

RESULTS AND DISCUSSION

Social networking communications and machine learning algorithms can be used to assess women's safety. To analyze it, the following modules were implemented: tweets on women's safety and security (MeToo tweets) were loaded into a dataset folder instead of using the Tweepy tool from Python (Figure 1). NLTK (Natural Language Toolkit) cleans the tweets, and the TextBlob corpora package with a dictionary counts positive, negative, and neutral polarity. After the 'Run Machine Learning Algorithm' button is clicked, the program estimates the tweet data using machine learning; each tweet is displayed in the upper panel with its text and polarity score, and all tweets can be viewed by scrolling. Clicking the 'Women's Safety Graph' button then displays the results, which help determine whether or not a location is safe for women.

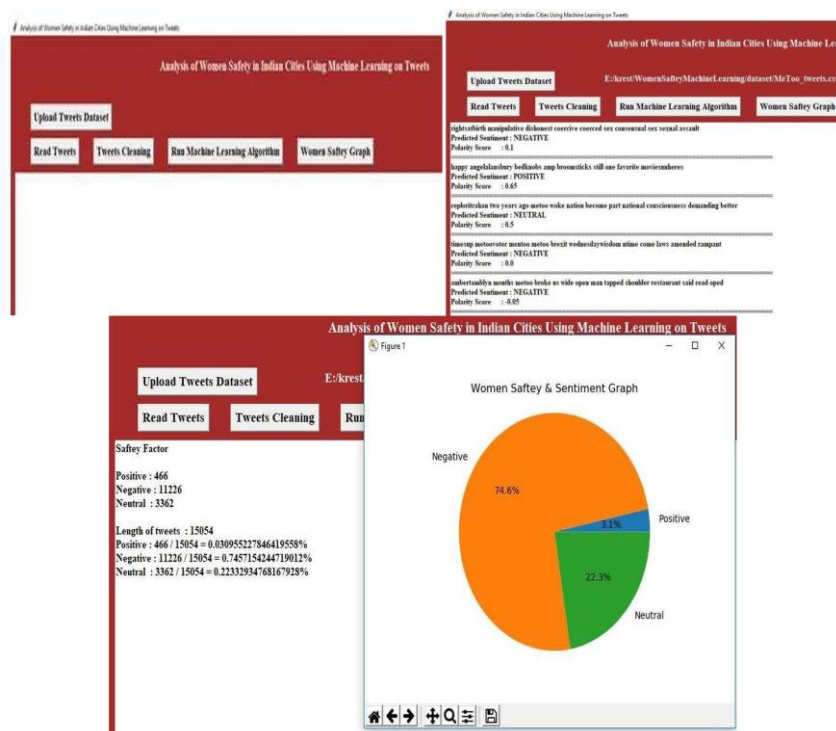


Figure 1: Machine learning program, loading tweets and generated results.

A total of 15,054 tweets were analyzed and it is found that 11,226 (74.6%) were negative, 3,362 (22.3%) neutral, and 466 (3.1%) positive. Because of the predominantly negative sentiment expressed, 74% of the location can be confirmed unsafe for women.

CONCLUSION

Machine learning algorithms help organize and analyze Twitter data, and the women's safety graph in the program helps in understanding the safety aspects of Indian cities. The machine learning algorithms can be extended to other social media platforms such as Facebook and Instagram.

REFERENCES

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