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Emotion Detection Using Social Media and Machine Learning

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Abstract*—Today we do a lot of things online from shopping to data sharing on social networking sites. Social networking (SNS) is good for releasing stress and depression by sharing one's thoughts. Thus, emotion detection has become a hot trend to day. But there is a problem in analyzing emotions on a SNS like twitter as it generates lakhs of tweets each day and it is hard to keep track of the emotion behind each tweet as it is impossible for a human being to read and decide the emotions behind tweets. So, to help understand behind the texts in a SNS site we thought of designing a project which will keep track of the tweets and predict the right emotion behind the tweets whether they have a positive or a negative sentiment behind them. This thought of project can be achieved by a integration of SNS with NLP and machine learning together. For SNS we will use Twitter as it generates a lot of data which is accessible freely using an API. First, we will enter a keyword and fetch tweets from the twitter. Then stop words will be removed from these tweets using NLTK stop words database. Then the tweets will be passed for POS tagging and only right form of grammatical words will be kept and others will be removed. Then we create a training dataset with two types positive and negative. Then SVM algorithm will be trained using this training dataset. Then each tweet will be passed to the SVM as testing dataset which in turn will return classification of each tweet as a whole in two classes positive and negative. Thus, our application will be helpful in recognizing emotion behind a tweet.

Keywords*— SNS, Stop words, Machine Learning, Sentiment analysis, Emotion recognition, NLP, SVM.

I. INTRODUCTION

The people uses many Social Networking Sites each day and communicate and share data with friends and family. The one of the most famous SOCIAL NETWORKING SITES is TWITTER which is used to share data and post on internet. The users using TWITTER constantly in the recent years. So, the analysis of this social networking sites help in answering and predicting many answers. This online social network is used by many of people around the world to remain socially connected to their friends, family members, and coworkers through
their computers and mobile phones. Twitter asks one question, "What's going on?" Answers must be fewer than 140 characters. A user can follow other users and can read her tweets on a daily basis. A user who is being followed by another user need not reciprocate by following them back, which leaves the links of the network as directed. Since
TWITTER launch July 2006, Twitter users have increased dramatically. Thus, this kind of SOCIAL NETWORKING SITES can be used to predict and analyze the large number of tweets generated and understand the sentiments behind each tweet whether it is positive, negative or neutral. So, we thought of designing a project to develop a system which helps in analyzing and helping in developing an application for the purpose of sentiment analysis

II. LITERATURE SURVEY

This section describes the fundamentals of various sentiment analysis techniques that can be used in designing a new more reliable emotion recognition system which will recognize the right emotion behind a tweet. It helps in understanding various ideas put forward by various technical papers published by various authors and how they put forth a more accurate and concrete techniques.
Paper: - Movie Recommendation System Using Sentiment Analysis from Microbloging Data.
Year: - 2020.
Author: - Sudhanshu Kumar , Kanjar De, and Partha Pratim Roy.
Technique: - Movie recommendation.
Disadvantage: - This paper presents gives movie recommendation and does not analyze the emotions behind those tweets.

Paper: -Comparative Analysis of Selection Algorithms for Computational Personality Prediction from Social Media.

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Year: - 2020.
Author: - Ahmed Al Marouf , Md. Kamrul Hasan, and Hasan Mahmud..
Technique: - Personality prediction..
Disadvantage: - This paper presents a valid approach for personality prediction and not applied it to other streams like emotion recognition.

Paper: - Online Public Shaming on Twitter Detection, Analysis, and Mitigation.
Year: - 2019.
Author: - Rajesh Basak, Shamik Sural , Niloy Ganguly, and Soumya K. Ghosh.
Technique: -Online public shamming detection on twitter.
Disadvantage: - This paper gives preference to public shamming and does not apply it to emotion recognition behind the tweets.

III. METHODOLOGY

So, to overcome the existing system and create a new emotion detection system behind a text we are going to develop a project with a combination of SNS twitter, NLP and machine learning together. We are going to use machine learning algorithm SVM to analyze the emotion behind each tweet of a specific keyword in two classes positive and negative.

IV. PROPOSED SYSTEM

This section is mainly divided in 3 parts with other sub parts in them. The text that follows explains the modules with block diagram or system architecture as shown in Fig. The working of the framework is explained as:

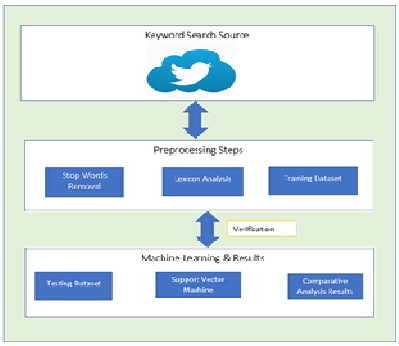

Fig.1 System Architecture Diagram

We propose a novel approach of emotion recognition behind a text using a combination of technologies such as SNS Twitter, NLP and machine learning algorithm SVM to predict correct emotions behind each tweet passed to it. Out project can be explained in following steps.

A. Tweet Collection

First and main part of the project is data needed for emotion recognition. We chose SNS Twitter which generates large amount of data daily. The tweets will be fetched from twitter server using Twitter API and twitter credentials. These tweets will be stored in a local fifile for further analysis.

B. Data Preprocessing

This module further cleans the tweets for passing it to machine learning. First the downloaded tweets will be passed for stop words removal using NLTK stop words array. The stop words removed tweets will then be passed for Lexicon analysis using POS tagging to fifind out correct grammatical words and remove unwanted words. Thus, these cleaned tweets will again save to a fifile for further use.

C. Machine Learning

In this module fifirst a training dataset will be created using two classes positive and negative using which can be used to teach SVM. Then testing datasetswill be created for each cleaned tweet. Then SVM will be trained using training dataset and each

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testing tweet i.e., testing dataset will be passed to it for prediction. The SVM will predict the emotion behind each tweet in two classes positive and negative.

V. RESULTS AND DISCUSSION

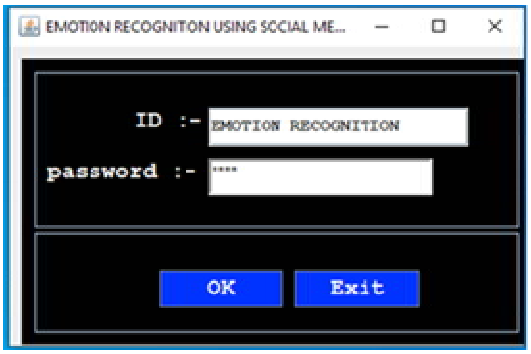

Fig2.login details

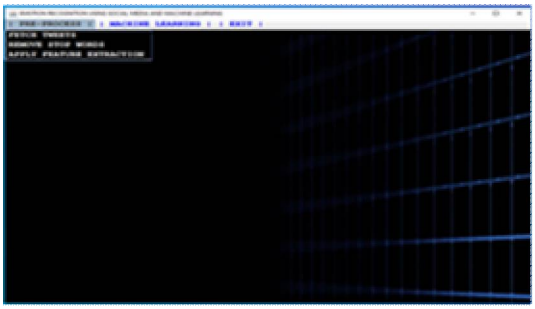

Fig3.Menu Screen

Fig4.Remove Stopwords

Fig5. Extract Features

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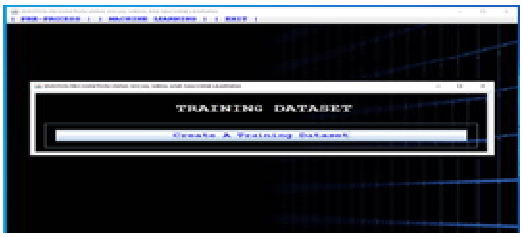

Fig6.Training Dataset

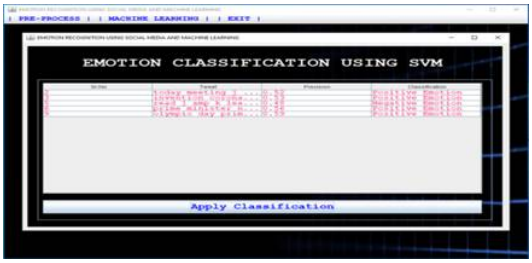

Fig7. Emotion Classification

VI. CONCLUSIONS

Thus, our system has achieved to recognize emotions behind large number of tweets at one go which is not possible for a human. We programmed the system with a combination of Java and Python together. We took in to consideration previous project ideas from [1][2][3] research papers to understand the techniques and disadvantages to make our system more accurate and user friendly to use. Thus, our project is a novel combination of SNS data, NLP and machine learning together. Our project classifies each tweet in two classes positive and negative emotions. Thus, we conclude that our application will be helpful in understanding the right emotions behind data from SNS without human interaction.

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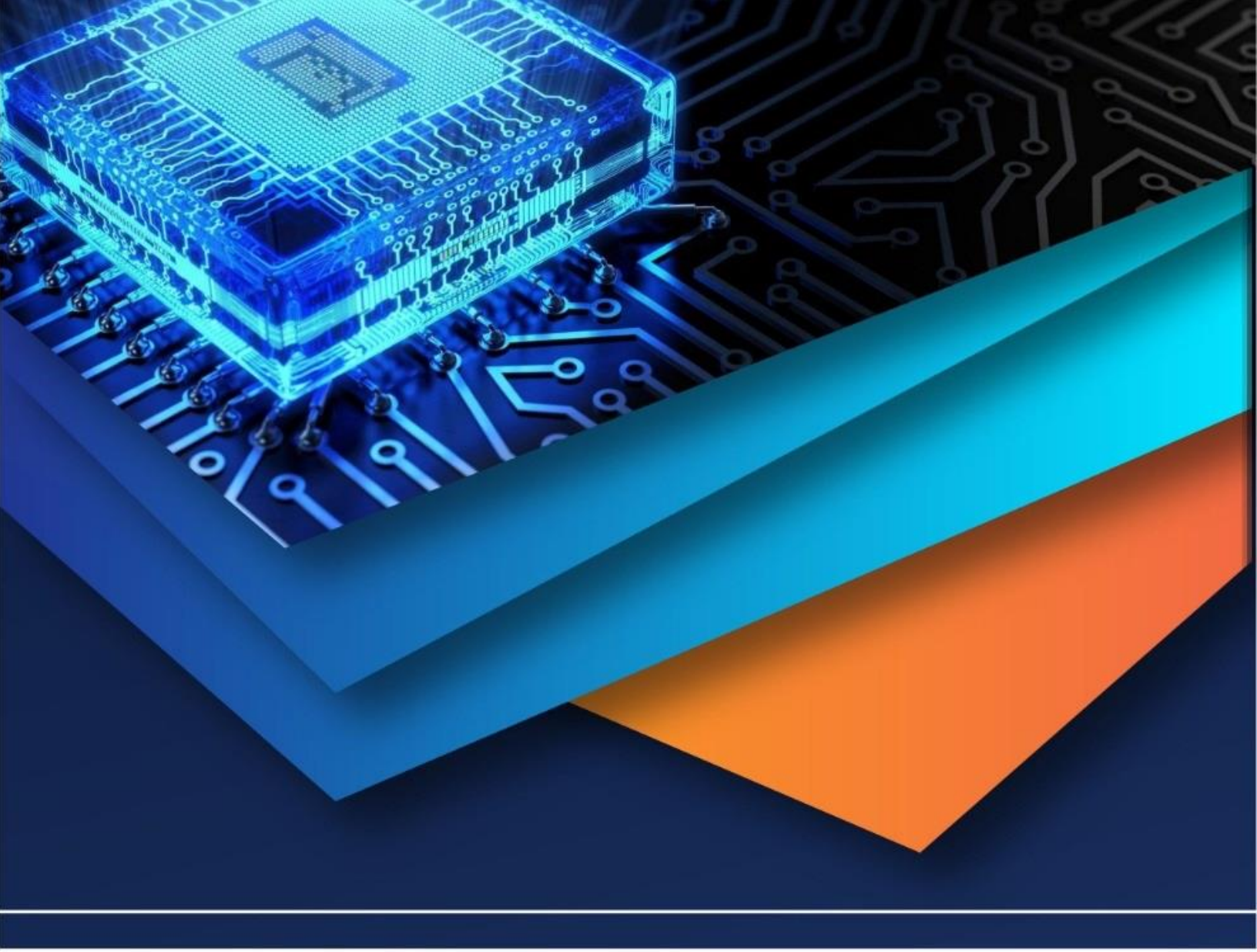

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