

# Textual Emotion Detection: A Comparative Evaluation of Machine Learning and Deep Learning Methods

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**Abstract:** Thanks for the dialogue, there are many comments every day. Most of the feedback is friendly and nicely-intentioned. But on occasion the phrases explicit anger, sadness, worries, and so on. Negative words prove that you aren't achieving your desires, which can be a distraction. Our activity is therefore to wagger the variations between the comments. For these paintings, device studying such as selection tree, random wooded area, SVM, logistic regression the use of tf-idf primarily based version and counting vectors and deep gaining knowledge of models. Among all deep getting to know fashions, they outperformed other machine getting to know models with 92% accuracy.

**Keywords-** Comparative Analysis, Emotion Detection, Machine Learning, Deep Learning

## I. INTRODUCTION

Emotional intelligence is the capability to understand your non-public behaviour, apprehend what is said to you, and comprehend how your behaviour influences the people round you. Searching for interest in textual content is basically a content material fabric-primarily based kind trouble that techniques content material fabric inside the context of linguistic processing with gadget analyzing [1].

Emotional intelligence has 4 components: self-cognizance, energy of thoughts, social reputation, and social manage. Self-consciousness refers to the capability to

apprehend and apprehend one's personal behaviours and their effect on conduct, thoughts and movements. Self-manipulate is the potential to successfully manage one's behaviour and behaviour, even in hard situations. Social interest is the functionality to apprehend and recognize the feelings of others, and relationship manipulate is the capacity to speak effectively and construct relationships with others.

Machine getting to know is a subfield of artificial intelligence that includes using algorithms and statistical models to permit pc structures to have a look at from information and make predictions or

decisions without being programmed. Sentiment detection the usage of device getting to know is a place of research that objectives to create algorithms and models that could find out feelings in unique domain names together with faces, speech, and textual content. These article pastimes to discover the concept of cognitive concept using system getting to know and its programs in several fields.

Sentiment detection the use of gadget learning consists of the use of numerous techniques which incorporates supervised reading, unsupervised learning, and deep studying to find out and classify sentiments from information. In academic supervision, the algorithm became educated on a list of facts, where every pattern is related to a completely unique concept label. The set of policies learns to apprehend patterns within the records and makes predictions approximately new, unseen statistics. In unsupervised studying, a set of rules learns to find out styles in facts without any previous annotation. In deep analyzing, neural networks are used to take a look at complicated representations of statistics and make predictions.

Cognitive gadget studying has huge applications in lots of fields at the side of medication, industrial company, education and leisure. In healthcare, emotional

intelligence may be used to find out highbrow health issues which consist of despair, anxiety and stress by way of the use of studying speech and facial expressions. In commercial enterprise, emotional intelligence can be used to investigate patron conduct and possibilities by means of reading client statistics and feedback. In education, emotional intelligence can be used to enhance student engagement and gaining knowledge of consequences by means of manner of reading facial expressions and speech styles. In leisure, emotion popularity may be used to beautify person revel in in digital fact and games via manner of analyzing client emotions in actual time.

While it is able to be useful, expertise the want for device reading comes with many stressful situations. A maximum important undertaking lies inside the lack of large and numerous datasets for education mastering models. Another challenge lies in the concept of character variations, in which top notch humans may additionally moreover explicit the identical feelings in special strategies. Additionally, the accuracy of emotional assessment models can be triggered with the resource of elements which consist of cultural elements, man or woman differences, and context [2].

## II. REVIEW OF LITERATURE

One of the precept standards associated with emotional intelligence is empathy, which refers to the ability to recognize and explicit the feelings of others. Research has shown that people with higher intelligence will be inclined to be extra empathetic [3]. This is vital in textual content verbal exchange because it permits people to better interpret the thoughts and messages conveyed via the textual content. Another related concept is emotional functioning, which refers to the attempt to manipulate the person's self a good way to meet the dreams of the scenario [4]. Studies have proven that people with better intelligence are capability to govern emotional hard work, resulting in appropriate performance and process pleasure [5] [6].

In addition, emotional intelligence has been verified to have a fantastic impact on trouble fixing in communication. Research has established that people with higher cognitive abilities are much more likely to use collaborative problem-solving techniques, ensuing in effective effects for all worried [7].

Supervised studying is one of the principal techniques of gadget studying used inside the search for sentiment in textual content. In this way, a version is skilled on a list of statistics in which each model is classified with the corresponding speculation. Various learning models together with Support Vector Machines (SVM), Naive Bayes and deep studying fashions which includes Convolution Neural Networks (CNN) and Convolution Neural Networks (RNN) had been used to investigate the hypothesis of articles [8][9].

Many researches have demonstrated that unique combinations which include text, audio and visual consequences can improve the accuracy of emotional popularity [10]. Other research has explored the results of various extraction techniques along with bag-of-words, phrase embeddings, and contextualized word embeddings on cognitive accuracy [11].

Table 1 gives diverse findings of the literature assessment in several contexts.

Overall, the literature shows that sentiment analysis in textual system analyzing is a promising subject of research with many packages in areas which include fitness, Social and monetary assessment. More studies are needed to explore the impact of various machines getting to know strategies and extraction techniques on the need to apprehend the reality.

**III. METHODOLOGY**

**A. Collection of datasets**

We use information downloaded from Kaggle. This report consists of English sentences and six names of different emotions related to them which incorporates satisfaction, disappointment, marvel, love, anger and worry. This data includes 16,000 instances to teach the version, 2,000 times to validate the version, and a couple of, 000 instances to check the model. Figure 1 indicates the graph of the sentence containing the most textual content in our records.

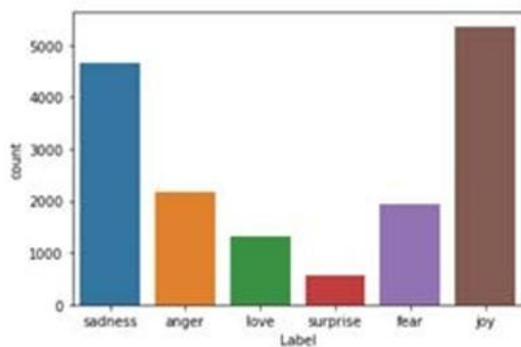


Fig. 1. Count of various Emotions

Figure 2 indicates the photo of the dataset used for our experiments with their labels.

	Text	Label
0	i didnt feel humiliated	sadness
1	i can go from feeling so hopeless to so damned...	sadness
2	im grabbing a minute to post i feel greedy wrong	anger
3	i am ever feeling nostalgic about the fireplac...	love
4	i am feeling grouchy	anger

Fig. 2. Snapshot of the Dataset

**B. Preliminary statistics**

Data pre-processing is the step in which we regulate the uncooked information in a manner that improves the overall performance of our version. Here we are able to cast off the text, save you the words, white location and convert our records to decrease case. And then we are able to use lemmatization to transform the phrase into its root shape (lemma).

**C. Design and assessment**

In this section, we can use unique techniques and growth various tool getting to know and deep analyzing methods such as LSTM, Multinomial Naive Bayes, Random Forest, SVM and ANN. Then we are able to evaluate them with numerous measures of accuracy, don't forget, accuracy, f1 rating, and so forth. Figure three indicates the confusion matrix of the Naïve Bayes classifier.

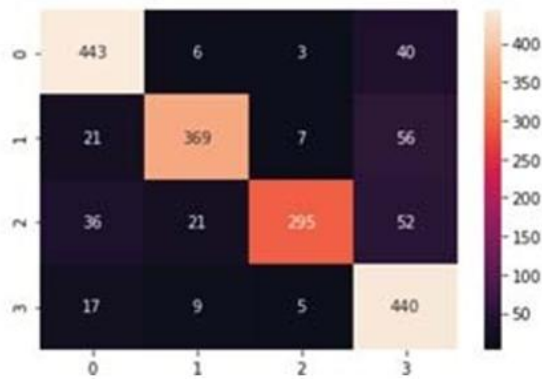


Fig. 3. Confusion Matrix of Naive Bayes Classifier

Figure four presents the confusion matrix of Random Forest Classifier.

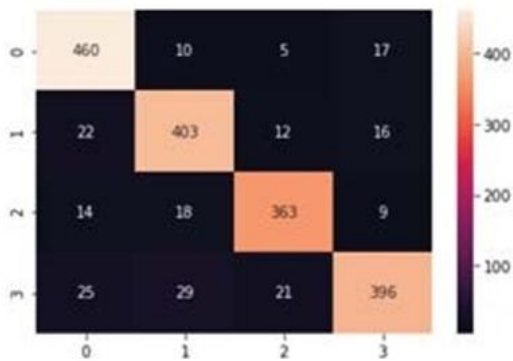


Fig. 4. Confusion Matrix of Random Forest Classifier

The method used for this research paper is proven in determine 5.

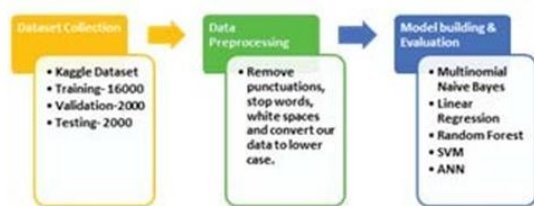


Fig. 5. Research Methodology

A contrast of numerous machine studying and deep gaining knowledge of fashions has been performed like Logistic Regression, SVM, Random Forest, Naïve Bayes and ANN and is proven in Figure 8. The comparison is based totally on

parameters together with accuracy, do not forget, fl score and precision and standards for accuracy, don't forget, and so on. Are given in equations (I) for the equation (IV). The ANN version offers the very best accuracy of all classifications.

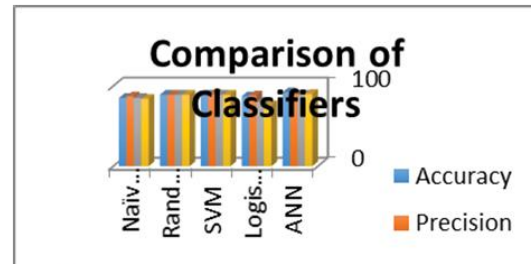


Fig. 6. Classifier Comparison on Test Dataset

#### IV. RESULTS

The experiments in this research are carried out the usage of system gaining knowledge of, which includes Naïve Bayes, Random Forest, SVM, ANN and Logistic Regression. The outcomes in the desk within the photo. 8 indicate that ANN classifiers obtain the best accuracy amongst all the different classifiers used to assess the textual statistics concept.

#### V. sCONCLUSION

The deep mastering version with Tfidf Victimizer offers us the first-rate outcomes with 92% accuracy, at the same time as different device gaining knowledge of fashions acquire much less than ninety% accuracy. Not best the accuracy of ANN, but additionally the precision may be very low. In the destiny, we can remedy

inconsistencies within the information the usage of extra scripts and create extra deep gaining knowledge of models. Overall, these findings recommend that emotional intelligence plays a crucial position in verbal exchange in textual content and related contexts. Further research is needed to recognize the impact of emotional intelligence on communiqué in exceptional contexts and contexts.

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