

# Feedback Sentiment Classification Using Machine Learning

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**Abstract:** *In recent years e-commerce and trend towards the online purchasing is increased, people often purchase the most of products from e-commerce shopping websites, customers rely on the number of reviews and stars of products to choose the right product for them. Fraud companies also pay fraudsters to increase the rating of a product, this tends to mislead the people and people end up with the product that they are not satisfied with. This can be stopped to some extent by using machine learning algorithms. The proposed method uses Machine Learning Algorithms like Naive Bayes, CNN, Support Vector Machine, Logistic regression Classifier which helps the people to differentiate disappointed feedback and satisfied reviews.*

**Keywords:** Amazon Dataset, Naive Bayes, Support Vector Classifier, Convolutional Neural Network, Logistic regression Classifier, Feedbacks Classification, Supervised Machine Learning, Flask, etc.

## I. INTRODUCTION

The aim of the project is to classify the user reviews into satisfied and disappointed, which is useful for customers as well as e-commerce companies. Before the pandemic, e-commerce was not so popular among people. People used to buy products & goods from the local stores, market, malls etc. But, when the pandemic starts, online shopping is the only easy way for people to fulfill their needs because of the restrictions. During the pandemic, e-commerce has become the conventional way for people to buy a product as online shopping grows in popularity shoppers continue to depend on online reviews for the authenticity of the product. 3 out of 4 people trust online reviews as much as personal recommendations.

## II. LITERATURE SURVEY

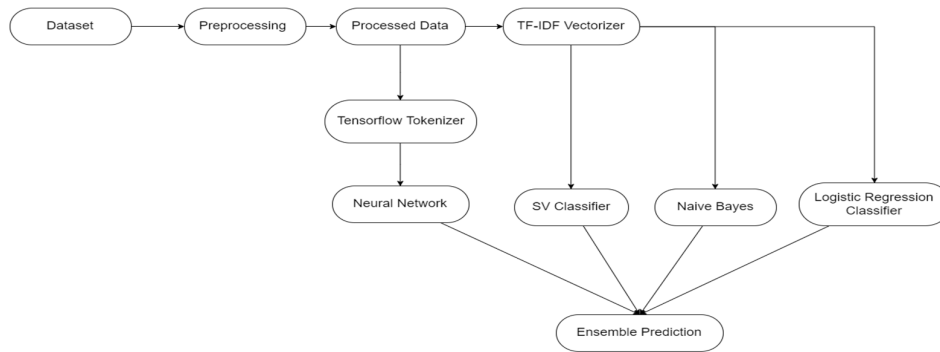
[1] Rami Mohawesh, Son N. Ttran, Robert Ollington. "Fake Review Detection: A Survey" To up hold the issue, this survey paper features the task of fake review detection, summing up the existing datasets and their collection methods. It examines the existing feature extraction approaches. It also summarises and examines the existing approaches critically to identify gaps based on two groups: traditional statistical machine learning and deep learning methods. The experimental results on two benchmark datasets show that Robert performs about 7% better than the state-of-the-art methods in a mixed domain for the deception dataset with the highest accuracy of 91.2%, which can be used as a baseline for future studies.

[2] Jingdong Wang, Haitao Kan. "Fake Review Detection Based on Multiple Feature Fusion and Rolling Collaborative Training" Here the author designed related algorithms to extract all the features of a review. Then the classification of the review is labelled manually. Finally, the method uses the initial sample set to train 7 classifiers, and the most accurate classifier will be selected to classify new reviews. The experimental results in the reviews of yelp shopping website show that the accuracy of the proposed method for detecting fake reviews is 84.45%, which is 3.5% higher than the baseline methods. And compared with the latest deep learning model, its baseline precision has increased by 5.3%

[3] M.F. MRIDHA, ASHFIA JANNAT KEYA, MD. ABDUL HAMID, MUHAMMAD MOSTAFA MONOWAR, MD. SAIFUR RAHMAN. This study aims to look into advanced and state of the under art fake news detection mechanisms thoughtfully. We start with spotlighting the fake news impacts. Then, we proceed with the discussion on the dataset used in recent research and their NLP method. A thorough overview of deep learning-based methods has been bestowed to organize representative methods into various categories. The prominent evaluation metrics in fake news detection are also discussed. Nevertheless, we suggest further recommendations to improve fake news detection mechanisms in future research directions.

### III. METHODOLOGY

#### BUILDING BLOCK OF Feedback Classification System



- **Data Selection:** In this step, we are selecting the data on the features such as user reviews, overall product.
- **Pre-processing:** The selected dataset from the 1st step is processed using python libraries such as nltk to remove punctuations, stopwords, URLs, emails, phone numbers.
- **Vectorization:** In this step vectorizers such as TF-IDF, Count vectorizer, which gives Nd array as output.
- **Training model:** The Nd array given by vectorizer is then provided to different machine learning classification. algorithms to train the models. The neural network is trained on the Nd array provided by the TensorFlow tokenizer.
- **Ensemble:** In this step the predictions of all models are combined to get the single result.

Home credit Customer review classification using machine learning

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**Review Classifier**

This is good product

Show Result

Customer is Satisfied

**Support Vector Classifier**



Satisfied

**Multinomial Naive Bayes**



Satisfied

**Logistic Regression**



Satisfied

**Artificial Neural network**



Satisfied

**Review Classifier**

This is very bad product

Show Result

## Customer is Disappointed



#### IV. CONCLUSION AND DISCUSSION

Using the machine learning classification algorithms like support vector machine, logistic regression classifier, Multinomial Naïve bayes and Convolutional neural network we have conducted a sentiment classification of user review into category as satisfied and disappointed. We have proposed a sentiment classification approach based on product aspects. The modules for this include Pre-processing Module, Product Aspect Identification, Sentiment Classification. The pre-processing module contains the sub modules for tokenization, stop word removal and Lemmatisation, and personal id removal processes such phone number, emails.

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