PROJECT PRESENTATION

FAKE REVIEW Detection SYSTEM

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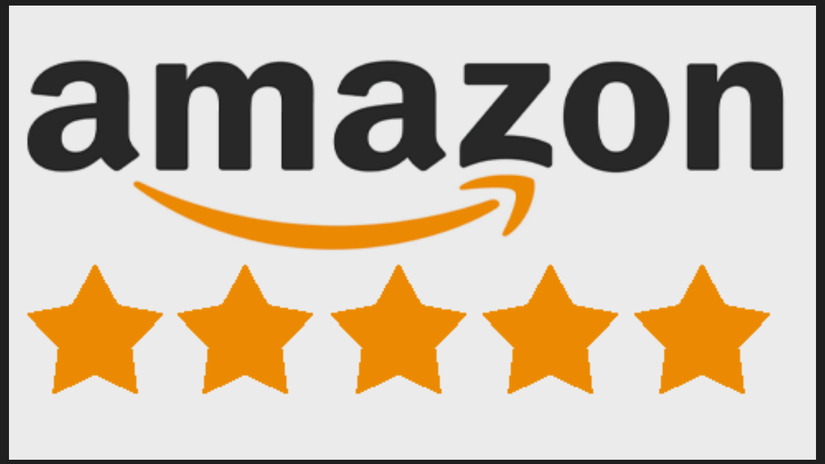
PROBLEM STATEMENT



How can the growing issue of phoney reviews on online review sites be addressed to ensure consumer choice is not compromised, and user-generated material is trusted?

This project examines fake online reviews and their negative impact on consumer choice and the credibility of user-generated content.

MOTIVATION

- ONLINE REVIEWS ARE CRUCIAL FOR CONSUMERS TO MAKE INFORMED PURCHASING DECISIONS.
- HOWEVER, PHONEY REVIEWS ARE WIDESPREAD AND CAN HARM BOTH CONSUMERS AND BUSINESSES.
- A RELIABLE METHOD FOR IDENTIFYING BOGUS REVIEWS IS NECESSARY TO ELIMINATE THEM FROM ONLINE PLATFORMS.
- THIS RESEARCH PROPOSES A METHOD THAT USES A MIX OF MACHINE LEARNING ALGORITHMS AND NLP TECHNIQUES.
- THE SUGGESTED APPROACH EXTRACTS ADDITIONAL CHARACTERISTICS TO DETERMINE THE RELIABILITY OF REVIEWS USING THE BERT MODEL AND INFORMATION RETRIEVAL TECHNIQUES.
- THE SOLUTION AIMS TO ACHIEVE HIGH ACCURACY IN IDENTIFYING FRAUDULENT REVIEWS BY UTILISING VARIOUS CLASSIFICATION ALGORITHMS AND ADVANCED NLP METHODS.

RELATED WORK

- Since 2007, the study of fake review detection has been conducted through review spamming analysis .
- The case of Amazon was looked at in this study, and the authors came to the conclusion that manually labelling fake reviews can be difficult because fake reviewers may carefully craft their reviews to make them more trustworthy for other users.
- As a result, they suggested using duplicates or nearly duplicates as spam to create a model that could identify fake reviews.
- [1]This paper proposes a CNN-based approach for fake review detection and compares its performance with traditional machine learning methods.
- [2] This paper uses CNN and DT. This system extracts features from the text of reviews using CNN and DT to classify whether they are genuine or fake.

RELATED WORK CONTD..

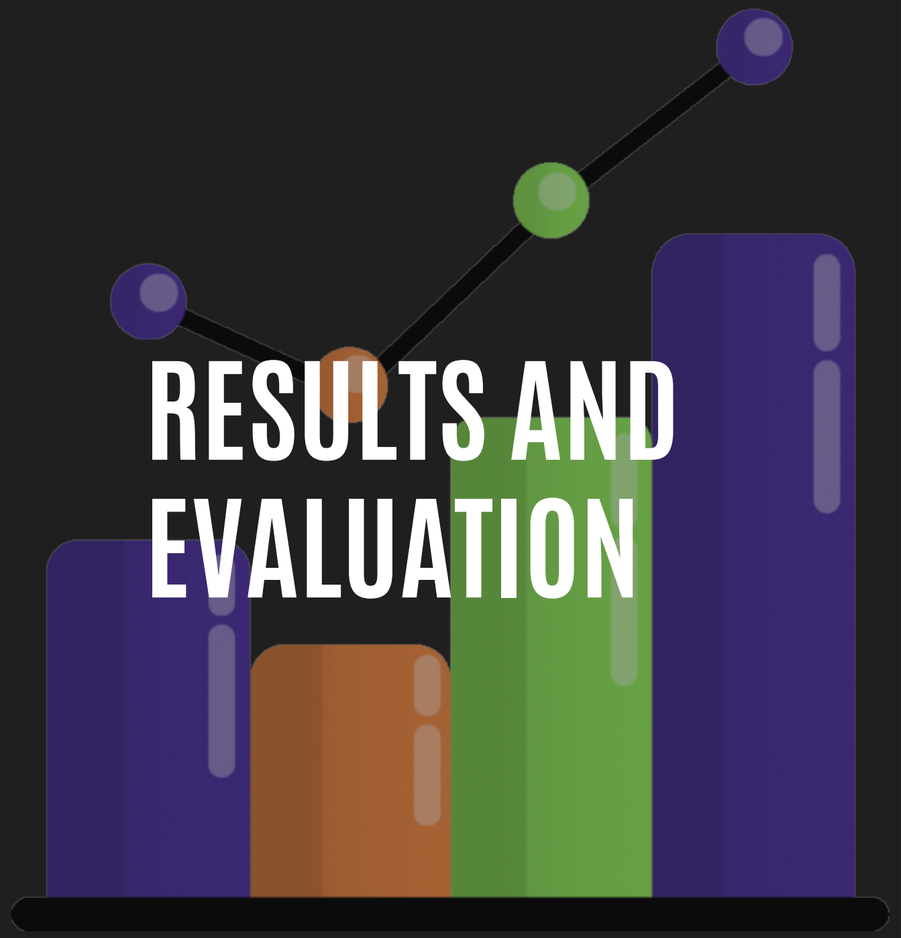
- [3] This paper discusses the impact of the fake review on business, and the different techniques. Used to detect them, including ML, NLP, DL and data mining.
- [4] This paper describes features used in the model including sentiment analysis, part - of - speech tagging. And user behaviour analysis. The author concludes with the approach that it can automatically detect and remove fake reviews, improving the overall quality.

METHODOLOGY

- The proposed solution for detecting fake reviews combined machine learning algorithms and natural language processing techniques.
- We have merged 2 datasets with the use of data scrapping to include different features so as to gain a better insight on the reviews.
- Additional features were extracted, such as sentiment, helpfulness score, ratings, product category, and overall score, to identify patterns that distinguish between genuine and fake reviews.
- Classification algorithms including Naive Bayes, SVM, Random Forest, Decision Trees, and Logistic Regression were used to classify the reviews.

METHODOLOGY CONTD..

- Deep learning Models have also been used to classify the reviews, and they have been seen to perform the best on our given dataset.
- Advanced NLP and DL techniques such as LSTMs, transformers, and the BERT model were used to capture the context and semantics of the text data.
- Model performance was evaluated using metrics such as accuracy, precision, recall, and F1 score.
- The proposed methodology aimed to achieve high accuracy in detecting fake reviews and provide trustworthy user-generated content for consumers.



RESULTS AND EVALUATION

- We have come to the conclusion that BERT and LSTM perform the best on our data, we report accuracies of 88% and 90% on the testing dataset respectively.
- Model performance was evaluated using metrics such as accuracy, precision, recall, and F1 score.
- The model performs decently as compared to SOTA(state of the art), and these models are able to decently handle the results on unseen data as well.

	F-1	Accuracy	ROC-AUC
SOTA	0.965	0.988	0.994
LSTM	0.895	0.8767	0.9455
BERT	0.912	0.8918	0.962

FRONT-END DESIGN

Fake Review Detection System

Importing Packages

Train/Validation Split

We split the dataset, keeping 20% of the training set for validation.

Long Short-Term Memory (LSTM)

Accuracy score: 0.8735

F1 score: 0.8909

ROC AUC score: 0.9423

Enter query here:

Submit

BERT

Accuracy score: 0.8918

F1 score: 0.912

ROC AUC score: 0.962

Enter query here:

Submit

Product Recommendation

Number of unique USERS in Raw data = 29440

Number of unique ITEMS in Raw data = 20564

UserId	0
A3OXHLG6DIBRW8	42
A281NPSIMI1C2R	39
AY12DBB0U420B	32
A1YUL9PCJR3JTY	31
A1TMAVN4CEM8U8	23
AZV26LP92E6WU	22
A1Z54EM24Y40LL	22
A36WGHR8TO5DKT	21
A2FRFAQCWZJT3Q	18
A1UQBFCERIP7VJ	18

RMSE SVD Model = 0.00715

Enter your UserID

200

Recommended Items	user_ratings	user_predictions
B005HG9ET0	0	0.5035
B007RTR9G0	0	0.1799
B004HOSGWE	0	0.1357
B004JGQ15E	0	0.1334
B000XIZLUS	0	0.1222

Select an option

B003P02EGU

The Creatures deliver the goods.: As a long time fan of all things Sioux, I was pleasantly surprised to see and hear this CD while browsing through a record store last week. Having just a bit of a jaded view of Siouxsie et al these days, I gave a listen and was instantly drawn back to their better days. ANIMA ANIMUS is like a very good Banshees album as done by The Creatures. I'd like to tag on an extra half star for Sioux's restrained use of 'gothic' lyrics. Kudos to Siouxsie and Budgie!

Lemon: The shaver was faulty. I charged it when I got it. Then it required recharging after two two minute uses. The same thing happened again, and I called you. I received a new one from you today, so we shall see.

Something's been missing...Here they come again...: This pair, has always exuded a peerless, sexually charged charisma, that remains unchallanged to this day! It's a bittersweet love affair, however; since they have ruined me for all others!With this latest offering, they have decided to indulge my carnal appetites once again. Thank the stars! She's a versatile and ultra-modern animal: works in the car, on the dancefloor, in that dark, dank leather-bar on the outskirts of the red-light district (hurt me)! The choice is yours. From sublime radiance to fits of fury, there is enough here to meet or beat any mood. Plenty of catchy hooks blended with Sioux and Budgies'inimitable take on life, and all that makes it so interesting.My only sorrow is that it comes and goes too quickly...no doubt, exactly what these wicked creatures had intended all along! Perhaps if I ask nicely, they will continue to spur my soul for years to come.

I found this drink to be somewhat refreshing. As one reviewer remarked, however, this does not provide a true black raspberry flavoring. I'd say that it more closely resembles a blackberry, boysenberry, or black currant flavor. In any case, it's fairly quenching. If it weren't so sickly sweet, I probably could've given it four stars.

I really liek the raspberry flavor and it is really great on a hot day. It quenches your thirst and has that refreshing taste that I like and enjoy.

NOVELTY

- Implemented a recommendation system using collaborative filtering
- Created two types of recommendation systems: general and personalized
- Top 10 and worst 10 users showcased based on helpfulness in reviews
- Recommendation system based on user history and ratings
- System designed to improve user experience and increase customer satisfaction
- Potential benefits include increased sales and customer loyalty

CONCLUSION AND FUTURE WORK

- The goal of detecting fake reviews is to ensure that customers can make informed decisions about products by weeding out biased ones.
- Machine learning algorithms, including random forests, lstm, and bert, were used to classify the dataset.
- LSTM (88% accuracy) and BERT (89% accuracy) outperformed other classifiers, highlighting the effectiveness of absolute classifiers in this task.
- Data visualization aided in exploring the dataset and identifying key features that improved classification accuracy.
- The high accuracy achieved by the various algorithms underscores their suitability for this task.
- The Futute Work is incorporating real-time or time-based datasets would enable us to detect fake reviews posted by users who are posting an excessive number of reviews in a short amount of time.
- Developing a method for unsupervised learning of unlabeled data could improve the ability to identify fake reviews

PROJECT CONTRIBUTION

AAYUSH KAPOOR :
1. BASELINE MODELS
2. NOVELTY
3. FINAL EVALUATION MODELS

ADITYA JAIN :
1. BASELINE MODELS
2. DATA SCRAPING
3. FINAL EVALUATION MODELS

SHASHANK SHEKHAR SINGH :
1. EDA
2. DATA SCRAPING
3. FINAL EVALUATION MODELS

VAIBHAV WALI :
1. MID EVALUATION MODELS
2. NOVELTY
3. FINAL EVALUATION MODELS

VASU KHANNA :
1. EDA
2. DATA SCRAPING
3. FINAL EVALUATION MODELS

YATISH GARG :
1. MID EVALUATION MODELS
2. FRONTEND
3. FINAL EVALUATION MODELS

NOTE : THE PROJECT WAS A COMBINED EFFORT OF ALL THE GROUP MEMBERS. THE MEMBERS WERE PRESENT THROUGHOUT THE PROCESS OF DEVELOPING THE SYSTEM. THE REPORTS AS WELL AS THE PPT ARE ALSO A COMBINED EFFORT OF ALL THE MEMBERS.

THANK YOU!!