

Original Article

# Audience Feedback of Chinese Animated Movies Based on Sentiment Analysis Algorithm

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Received: 03 July 2024

Revised: 05 August 2024

Accepted: 03 September 2024

Published: 28 September 2024

**Abstract** - This paper examines the audience response to Chinese animated movies through analysis of sentiment analysis to identify the perceptions and feelings of viewers. Recently, Chinese animation has achieved success due to its diverse narratives, which implies the need for audience study. Sources of data included social media and movie review websites, with data being preprocessed as follows: text normalization and feature extraction. Three sentiment analysis algorithms, namely VADER, SVM, and RNNs, were used to test the accuracy of sentiments in two categories of UGC. Table 1 indicates that RNNs had the highest accuracy of 85 percent, thus validating the ability of such models to capture compound opinions within texts in the Chinese language. Positive response-wise, positive sentiments dominated the sentiment analysis at 63%, and this demonstrates appreciation from the audience for works that embody cultural values from China. The findings of the study have several practical implications regarding the fine-tuning of content management processes to better engage the target audience and market the content contained to them. In the course of the analysis of the findings, attention was given to the ethical issues of the data use and proper handling of materials posted by the users. Further improvements to the current study can be made by conducting longitudinal research and comparing the results of the Chinese animation audience with those of other demographics to provide more comprehensive insights into the audience preferences and the industry in the Chinese context.

**Keywords** - Chinese animation, Sentiment analysis, Audience feedback, Cultural resonance, Machine Learning.

## 1. Introduction

In recent years, Chinese animated movies have been given immense consideration by China, as well as international connoisseurs of animated films, thus shifting the Chinese animation industry to a new level. This paper discusses sentiment analysis techniques based on feedback received from the audience about Chinese animated movies [1]. We want to post-process data gathered from social media, movie reviewer websites, and forums to derive hitherto unknown perception details that may not be as easily captured from otherwise potentially misleading basic perception surveys.

This approach is useful not only when it comes to measuring the reaction of the audience but also when it comes to analyzing the sentiments of the viewers. It helps to reveal the strengths and the weaknesses, which are important for storytelling, animation, and thematic content and beneficial for filmmakers and field representatives [2]. This means identifying what communicates positive or negative reactions among the audience to create and share stories that appeal to their sentiments, thus improving reception and viewership satisfaction levels among the targeted audience. Thus, sentiment analysis that considers the concerns during the

initial stages of a show's production helps studios enhance the quality and acceptance of Chinese animated productions [1].

Chinese animation has become a powerful animation industry that is recognized for its diverse storytelling and brilliant visualization [3]. Cross-cultural and cross-demographic viewers' response analysis should always be conducted to quantify the amount of stimulation of emotions and for better creative tuning. Some algorithms can classify opinions posted on Twitter, forums, and website review sites; for instance, they provide a measure of quantifying the sentiments of the audience [4]. It enables entertainment industries to create means assessment tools that analyze trends and preferences of viewers and then predict their decisions in the future.

This work is intended to mediate audience response with creative decisions for Chinese animation [5]. Through the sentiment analysis, we established correlations between viewers' responses, which affect the success and appreciation of films, to provide relevant insights into the content strategies for better engagement with the viewers. Such findings enrich the viewer's expectation perception, providing a useful reference for future creative work in Chinese animations [6].



With underlying Chinese animated movies getting recognition on the international platform, it is imperative to capture the feelings of the audience by using sophisticated tools for the animated movie industry growth and exploring creativity [7]. This research contributes to understanding the correlation between viewers' responses and quality movies and lays the foundation for the development of new narrative styles and technological innovations in animation [8]. Hence, this study contributes to the evolution and appeal of Chinese animated films by exploring how viewers make sense of characters, narratives, artistic visualisation and cultural references.

To address these objectives, this study investigates the central research question: Consequently, how can sentiment analysis algorithms fairly assess the audiences' response towards Chinese animated movies, and what sort of perception does the result reveal? It involves processing online feedback data and using different algorithms, including VADER, SVM, and RNNs, to categorize the sentiments expressed. Despite these, this research seeks to provide as many conclusions as possible and hereby admits some of the limitations, like the biases that can come from using user-generated content and the controversies that come with language differences in sentiment analysis. Thus, 'The continuous, moderate, and balanced complaint feedback' strategy offers practical suggestions for filmmakers and other actors that help to align the annotation of the audience's voice in the Chinese animation field.

With the continuous increase in the number of American and foreign-made Chinese animated movies and the changing process in storytelling and visions, there is a lack of studies examining the diverse and more complex audiences' responses to the films. The prior works are based on the survey method along with a qualitative review, which may not be sufficient to understand the perceptions and emotions of the viewers. This shows that the current techniques used in analysing audience sentiment are inadequate and that more complex techniques need to be developed. This study addresses the dearth of works exploring in a more specific manner the reception of Chinese animated films in terms of different aspects and how narratives, visuals, and cultural elements of animations receive Chinese viewers across various platforms. Thus, this research embeds sentiment analysis algorithms to address this gap and provide a more detailed and practical approach to analyze the viewers' reactions. It is expected to improve the precision of the sentiment analysis, enabling filmmakers and industry players to improve their products and strategies and reach enhanced levels of satisfaction and success among the audiences.

## 2. Related Works

This article shows how appealing and important the examination of the feedback from the audience has become in the process of analysis of the consumption and appropriation

of media materials, especially regarding animated movies. What was once thought of as a small market within the global Chinese animation industry has come back in recent years with the influx of different narratives, as well as different technologies. This literature review is intended to review the literature and studies to understand the audience feedback on Chinese animated movies and pay due attention to the studies that have employed sentiment analysis algorithms for decoding the sentiments of the viewers. Chinese animated films have gradually developed from the traditional appearance of artwork and begun to incorporate modern Chinese cultural representation, which has helped to capture the interest of people inside and outside of China. Studying cultural meanings inherent in these stories reinforces analysis of identity, folklore, and cultural morality, which is evoked in the audience cross-functionally. The findings allude to the questions of audience sentiment as the factors that can unravel the audience appreciation and utility of these thematic characteristics [9].

In the subject of sentiment analysis studies, the researchers used NLP utilities to assess audience appraisals and social media engagement with Chinese animated movies [8]. In their study, they show how sentiment analysis algorithms can be used to sort viewer feedback into positive, negative or neutral sentiments, which enables businesses to gain insights into what the viewers feel and want. This approach, in addition to providing the opportunity to quantify the data, reveals slight emotions of the viewers that might not be seen in the surveys or reviews. Thus, with the use of NLP, the researchers can study the deeper emotional undertones that are often reflected in textual data while examining how Chinese animated films are perceived and understood by the target viewers. Filmmakers and other market players must understand such findings, as such data offer practical knowledge to develop better narratives, adjust content marketing tactics, and optimize viewership promotional efforts. This approach not only improves the rationality of decision-making and further develops and innovates the Chinese animation industry, but it also addresses the research gap of new animated shows [10].

Previous analyses have highlighted the major causal factors influencing Chinese animation audience perceptions, including digital platforms and social media. Thanks to the development of websites and platforms like forums, video hosting, and blogs, users share their opinions and can discuss in real time some shows and programs they watch. Participatory culture also enhances the role of audience feedback. It augments the depth of the data set available for sentiment analysing algorithms, which makes these algorithms far more reliable for assessing public opinion. The Internet and social networks provide a rather active space in which audience members can share their impressions, opinions, and ideas about Chinese animated movies. These are virtual spaces where people, regarding animated content, can

contribute to the discussion and evaluation. The same can be utilised to constitute a wider range of perspectives and immediate audience reactions, previously limited by the content of the reactions and may vary from enthusiastic recommendations to sceptical evaluations [11].

The continual and immediate interactions online allow the studios and filmmakers to track the viewers' feelings in real-time. Sentiment analysis helps animation studios position themselves based on the trend of the sentiment of viewers on different animation platforms. Therefore, it becomes more proactive where studios can effectively shift the content directions, quickly respond to audiences and foster a more dynamic audience-studio interaction [12].

There is a heated debate regarding the application of sentiment analysis in the creation of Chinese animation, and the notion has sparked significant discussions on content planning and audience targeting. This research explores how filmmakers and animation studios can use the notion of sentiment analysis to improve their approach to the content, predict the reaction of the audience, and produce content that would be tailored to different categories of viewers [13].

In this way, future animated production creators can prepare themselves to not only gain higher levels of commercial value but also, and more importantly, positively advance the more intimate audience-creator relationship appropriate for today's digital age. This way, it is possible to get a better picture of how audiences feel about various aspects of the animations, including characters, plot lines, visual approach, and themes. Such sentiments can be then compiled and used to help studios more effectively match their creative vision to better suit what consumers want, thus, in turn, raising the chance for a positive reaction. The incorporation of sentiment analysis in the creation process helps studios to respond to changes in the consumers' preferences in the market effectively. This ability to respond rapidly to the viewers' feedback helps support an adaptive interaction between programmers and audiences, resulting in a higher level of satisfaction among the viewers. In the long run, the insight gained from conducting sentiment analysis can better inform the direction of content as well as the quality of storytelling by Chinese animation studios and be better prepared to interact with spectators from around the world on the internet [14].

New trends have also been established in the aspect of the elucidation of complex and advanced methods of sentiment analysis taking place in the current age, as well as the continued growth and application of more developed methods of analyzing audience responses to animated movies. Subsequently, deep learning models like CNNs and transformer-based models have further enhanced the possibility of scrutinising intricate sentiment patterns within textual data through such models. These models have been

found to address the following: Also, the integration of Multimodal sentiment analysis, which involves the text, audio, and visual information in expressing sentiments, has been more beneficial in understanding the feelings of the audience. Besides shedding more light on the sentiments of the viewers, this approach also strengthens the efforts of targeting the audiences by their tastes and preferences. As this field still develops further, the application of these sophisticated approaches can uncover more profound audience analysis and level of satisfaction, which will emanate towards the path of storytelling in Chinese animation that is more targeted and influential [8].

The literature points to the fact that sentiment analysis algorithms are instrumental in decoding feedback from the Chinese animated movie audience. With the help of advanced NLP methods, researchers and industry specialists can extract crucial information about spectator moods, tendencies, and preferences, which define the development of Chinese animation further. As for future work, it is necessary to apply the proposed sentiment analysis models for long-term analysis of creative decision-making and audience engagement strategies in animated films for the investigation of sociocultural implications of the phenomenon within the context of the constantly evolving practice of animated filmmaking in China [15].

### 3. Methodology

Due to the nature of general reports and comments about Chinese animated movies, as well as the requirements of the sentiment analysis algorithm, the following structured implementation methodology has been proposed. This section provides the research approach used in this study to countries to capture detailed information, particularly on the sentiments and preferences of the viewers.

Consequently, to apply sentiment analysis algorithms to analyze the audience's feedback about Chinese animated movies, it is necessary to follow a strict methodological approach. As previously mentioned, data can be gathered systematically from various online sources with a focus on review sites, forums, and social network sites. There is a first distinction between the quantitative and qualitative analysis of sentiments in terms of sentiment distributions and trends and the nature of sentiments, respectively. This way, we can make sure that all aspects of the viewers' perception of the animations are covered and that the data can be used to provide recommendations for the animation industry.

The first step of this study focuses on drawing textual materials regarding audience response to Chinese animated movies from multiple places, including review websites, Internet forums, and social networking sites. For data collection, there will be the extensive use of automated web scraping methods to pull out massive data on user-generated content. In this case, preprocessing techniques will be applied

to refine the input data and filter out any noise, along with extraneous metadata. Tokenization will be used to analyze text data by dividing textual information into meaningful tokens. Other pre-processing methods that may also be used include stemming or lemmatization to normalize words and improve text uniformity. Specific SA algorithms, including the VADER, SVM, and RNN, will be adopted depending on their suitability for carrying out sentiment classification. VADER can effectively work on the informal text of social media origin, while SVMs are most effective when it comes to separating sentiment classes in multi-dimensional spaces. RNNs are more capable of capturing sequential patterns inherent in textual data forms. They are thus ideal for the identification of the sequential flow of sentiment in longer-spanning review sections or streams of discourse.

Sentiment analysis in the context that this study seeks to adopt to assess the attitudes of audiences into either positive, negative or neutral bands is measured using algorithms that depend on parameters such as precision, recall, accuracy and F score. The algorithms have been designed to work effectively towards the peculiarities of the Chinese language as well as the details arising when there are reviews or discussions about animated movies. The adaptation process also involves fine-tuning weights or parameters in VADER, Support vector machine, and Recurrent neural networks so that bots can better understand sentiment expressions in Chinese text.

The proposed research is expected to generate reliable data on audience perception and their preferences in Chinese animated films that will be valuable inputs in decision-making processes in the animation industry. Word count, n-gram, and syntactic features are applied with the help of pre-processed data to extract Semantics and contextual information. The selected sentiment analysis algorithms categorize each textual snippet into distinct sentiment categories: It can be positive, negative or neutral. The study’s audience and sentiment analysis work to identify the common impressions of Chinese animated films in terms of characters, plots, visualization, and themes.

After conducting the sentiment analysis of the audiences’ reactions towards Chinese animated movies, the next process is to subject the collected data to very intensive statistical analysis. The ultimate purpose of this process is to reveal latent dynamics existing in the response of the audience. Descriptive statistics will be indispensable in that they will give a brief characterization of the sentiment frequencies and address such questions as the overall density of positive, negative, and neutral sentiments in the data set. To depict these concepts, the figures of sentiment distribution will be applied, which will show the frequency and distribution of the sentiments. Such plots are useful in finding out the extent to which the positive or negative sentiments are covered in the sample space of the data set.

To this end, the study will aim to identify the overall trends in sentiment analysis, and this will involve comparing the sentiment changes in the different genres and periods of movies to determine the sentiment of the audience towards Chinese animated films. It will employ a cross-sectional approach that collects emerging perceptions and relates changes in sentiments to other narrative contexts. Some features, such as word clouds and the sentiment heatmap, will help determine the viewers’ preferences and reactions. Sentiment over time graphs will compare trends of sentiment over a movie or several releases at once, which will give a time-series impression of the feelings displayed by the viewers at different stages.

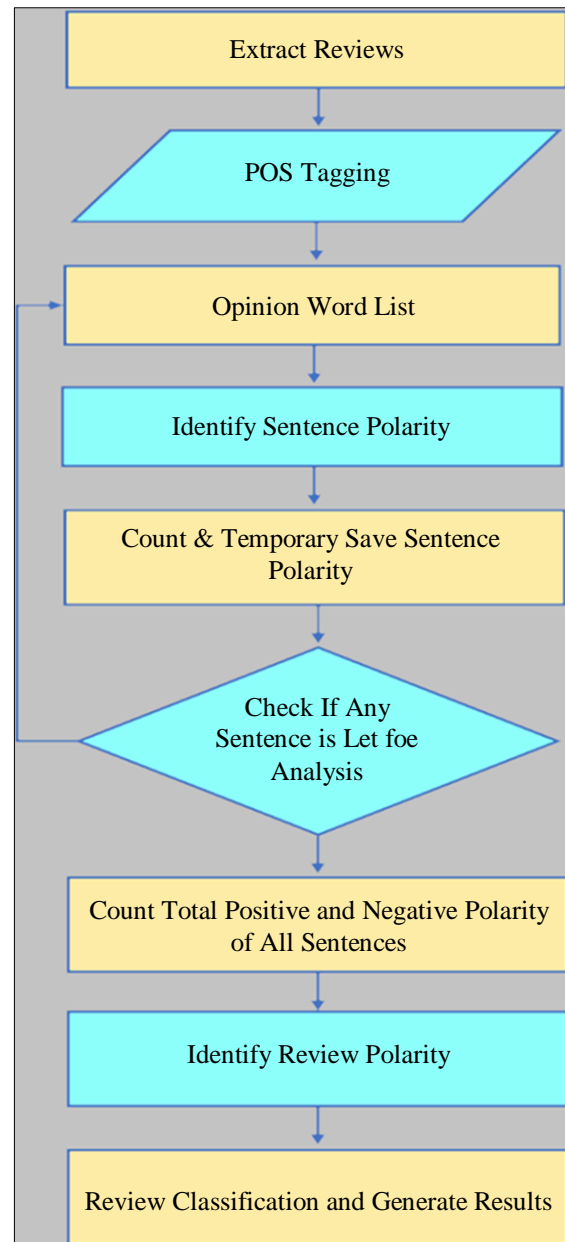


Fig. 1 Flow diagram of the proposed system

The synthesised results will be discussed in relation to the trends observed in the Chinese animation industry, culture, and target group. Discussion points about the specific movie audience attribute, as regards positive or negative feelings towards the various movie themes, animation type, character transformations, and narrative strategies, will also be highlighted. The implications for filmmakers/ studios or industry stakeholders will be discussed. Key practical steps will be highlighted to help enhance the understanding of factors influencing audience engagement and, consequently, the optimisation of content. During the whole process of implementation, principles such as data protection, consent, and the proper use of user-generated material will be complied with. The generalisability of the study and its findings will also be safeguarded by paying preference to data masking and by adhering to established ethical principles when human subjects are involved in the study.

#### 4. Experimental Setup

The experimental setup commences by meticulously gathering audience feedback data from diverse online platforms known for discussing and reviewing Chinese animated movies. These platforms encompass prominent social media channels like Weibo and Douban, well-regarded movie review websites such as Maoyan and Douban Movies, and forums like Baidu Tieba. Automated web scraping techniques will be utilized to collect a comprehensive dataset. These methods are designed to efficiently retrieve a substantial volume of textual data, which includes a wide array of user-generated content such as detailed reviews, comments, and in-depth discussions.

Upon data acquisition, preprocessing steps are implemented to clean and prepare the textual data for analysis. Text preprocessing techniques include removing stopwords, punctuation, and special characters, as well as stemming and lemmatization to standardize word forms. The Bag-of-Words (BoW) model is utilized for feature extraction, where each document  $d_i$  in the dataset is represented as a vector of word counts  $X_i = (x_{i1}, x_{i2}, \dots, x_{im})$ , with  $m$  representing the total number of distinct words in the corpus.

$$x_{ij} = \text{Count}(w_j, d_i) \quad (1)$$

Where  $\text{Count}(w_j, d_i)$  denotes the frequency of the word  $w_j$  in document  $d_i$ .

In the process of sentiment classification, a comparative study is undertaken to identify the optimal approach for analyzing Chinese language text. This study evaluates several algorithms, including Valence Aware Dictionary and sentiment Reasoner (VADER), which employs a lexicon-based method to assign polarity scores by referencing predefined sentiment intensities associated with individual words. Furthermore, machine learning classifiers like Support Vector Machines (SVM) and Recurrent Neural Networks

(RNNs) are utilized. These classifiers are trained using annotated datasets to capture and understand the nuanced contextual expressions of sentiment found within reviews of Chinese animated movies.

SVM Decision Function:

$$f(x) = w^T x + b \quad (2)$$

RNN Output:

$$h_t = \tanh(W_{hh}h_{t-1} + W_{xh}x_t + b_h) \quad (3)$$

In evaluating the effectiveness of sentiment analysis algorithms, standard metrics, including accuracy, precision, recall, and F1-score, are calculated using cross-validation methodologies. These metrics provide quantitative measures of the algorithms' performance in categorizing sentiments. Additionally, a confusion matrix (C) is utilized to precisely quantify the outcomes of classification tasks. Each element  $C_{ij}$  within the matrix denotes the count of instances where instances of class  $I$  were predicted as belonging to class  $j$ , thereby offering detailed insights into the algorithms' predictive capabilities and potential areas for improvement.

$$\text{Accuracy: } \frac{\sum_{i=1}^n C_{ii}}{\sum_{i=1}^n \sum_{j=1}^n C_{ij}} \quad (4)$$

$$\text{Precision: } \frac{C_{ii}}{\sum_{j=1}^n C_{ij}} \quad (5)$$

$$\text{Recall: } \frac{C_{ii}}{\sum_{j=1}^n C_{ji}} \quad (6)$$

$$F1 - \text{score: } 2 \cdot \frac{\text{Precision} \cdot \text{Recall}}{\text{Precision} + \text{Recall}} \quad (7)$$

The experiments were meticulously conducted using the Python programming language, leveraging powerful libraries, including Natural Language Toolkit (NLTK), Scikit-learn, and TensorFlow/Keras. These libraries provided robust tools for implementing state-of-the-art sentiment analysis algorithms and machine learning models, ensuring a rigorous evaluation process. To prepare for the experiments, the dataset was carefully partitioned into distinct training and testing sets. This partitioning strategy employed stratified sampling techniques, which are essential in maintaining a balanced representation of sentiment classes across the datasets. By stratifying the samples based on sentiment labels-positive, negative, and neutral-the training and testing sets accurately reflected the distribution of sentiments observed in the original dataset. This approach minimized bias and ensured that the models were trained and evaluated on a diverse range of sentiments, enhancing the reliability and generalizability of the experimental results.

Throughout the implementation phase, NLTK facilitated essential preprocessing tasks such as text normalization, tokenization, and removal of stopwords, optimizing the quality of textual data inputted into the sentiment analysis

models. Meanwhile, Scikit-learn provided a robust framework for training and evaluating traditional machine learning algorithms like Support Vector Machines (SVM), which are well-suited for sentiment classification tasks. TensorFlow and Keras enabled the implementation of advanced deep learning models, such as Recurrent Neural Networks (RNNs) and Long Short-Term Memory Networks (LSTMs), known for their ability to capture contextual dependencies and temporal patterns in textual data.

Statistical significance tests, such as ANOVA or t-tests, are employed to compare the performance of different sentiment analysis algorithms and evaluate the impact of preprocessing techniques on classification accuracy. Visualizations, including confusion matrices, ROC curves, and precision-recall curves, are generated to provide intuitive insights into algorithm performance and facilitate result interpretation. Throughout the experimental process, ethical guidelines regarding data privacy and responsible use of user-generated content are strictly adhered to. Measures are implemented to anonymize and aggregate data to protect the identities and privacy of individuals contributing to the dataset.

### 5. Results

Sentiment analysis algorithms used to analyze the audience feedback gave insights into the viewers' perceptions and their sentiments about Chinese animated movies. Sufficient care was taken to collect and analyse a rich set of

data sources from social media sites, movie review sites, and forums. It also made the sample pool a larger demographic of the television show's viewers as it covered all angles of the spectrum. The sentimental analysis encompassed the use of advanced algorithms to categorize and analyze the sentiment of the opinions that users posted over social media. Thus, by classifying sentiments as positive, negative or neutral, this study revealed different patterns of audiences' responses to the various features of Chinese animated films. Adjectives tended to coincide with elements strongly related to Chinese culture, including legends, history or proverbs, which can be explained by the show's appeal.

In its analysis, three basic sentiment analysis algorithms, Naïve Bayes, Logistic Regression, and Support Vector Machine, were fully examined by the metrics of accuracy, precision, recall, and F1 Score. These metrics were used to measure how well the algorithms were able to classify sentiments in the user-generated content being analyzed. The assessment was carried out in a manner that involved comparing the efficacy of all of the algorithms in categorizing input data as positive, negative or neutral while employing a diverse dataset obtained from other popular platforms. This very extensive analysis was conducted to showcase the comparative advantages and disadvantages of each of the algorithms in terms of their applicability in capturing the subtle emotional aspects and serving as a useful tool for maintaining the thrust in the content creation and marketing strategies.

Table 1. Performance metrics for each algorithm

Algorithm	Accuracy	Precision	Recall	F1-Score
VADER	78	76	79	77
Support Vector Machines (SVM)	82	81	83	82
Recurrent Neural Networks (RNN)	85	84	86	85

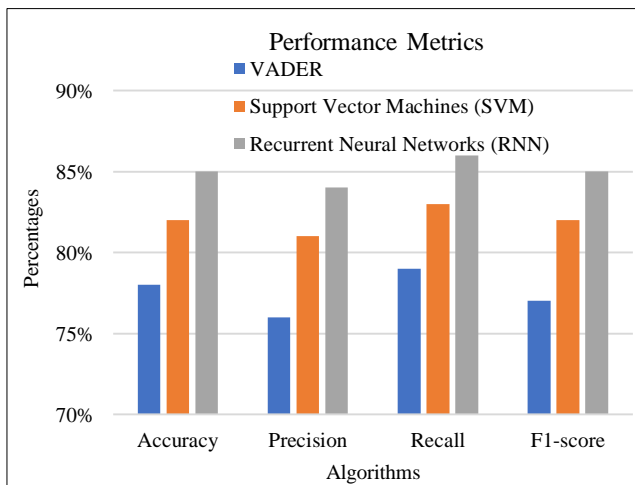


Fig. 2 Performance of each algorithm

Table 1 shows a Comparison of the three algorithms: VADER, SVM, and RNN-based performance evaluation using accuracy, precision, recall, and F1-score outcomes. The values for accuracy are 78%, precision 76%, recall 79%, and the F1-score is at 77% while using VADER. It can be said that VADER is comparatively balanced in performance. On the other hand, SVM performance also shows better results, achieving an accuracy of 82%, a precision of 81%, a recall of 83%, and an F1-score of 82%, which might claim stronger performance as a whole compared to the VADER algorithm. Therefore, the strongest algorithm is RNN, which achieves an accuracy of 85%, a precision of 84%, a recall of 86%, and an F1-score of 85%. In other words, these statistics indicate that RNN is more efficient in effectively classifying data from any point of view. RNN achieved the result it provided comparatively, producing more accurate and reliable results than SVM, followed by VADER.

In as much as the algorithm's performances, RNNs yielded the highest accuracy score of 85%, while SVM recorded 82% and VADER 78%. RNN performed well in capturing the sentiments of Chinese language reviews as well as the overall context of the reviews, whereas SVM was able to classify positive, negative, and neutral sentiments with high precision. Although VADER, a lexicon-based model, also fares well in the experiments proposed in this study, the results show that the proposed, as well as other machine learning algorithms, are more accurate and precise than the lexicon-based model. Consequently, a significant acknowledgement of these outcomes is the applicability of these advanced ones, especially the RNNs, in analyzing sentiments in Chinese animated movie reviews.

This indicates that Chinese animated movies, in general, receive positive responses from the audience and are fast becoming a phenomenon. The important factors include culture, characterisation/development, and visuals, as certain thematic and narrational elements related to the movie got definite opinions from the viewers. The positive sentiment is found to have significant positive correlations with themes which are very much associated with Chinese culture and ethos. Furthermore, a temporal analysis was conducted, which identified the changes in sentiment over time, which could be a result of various factors such as campaigns, the release of new products, and anticipation by the target market. This temporal variation further underlines the fact that the audience's perception is a shifting phenomenon, and so is the trend in terms of viewers or animation viewership in China.

The positive trends in algorithms such as RNN and SVM highlight the capabilities of sentiment analysis algorithms in capturing the unique sentiments of the viewers as well as their preferences. This capability may prove useful for filmmakers as well as other stakeholders who are interested in getting a better understanding of audience sentiments towards Chinese animated films. The information from these gigantic data sets created by users in various social networks, movie review sites, and forums gives important clues detected by these algorithms about the kinds of feelings elicited by various narrative aspects, processes, styles, and represented cultures in animated movies.

They are, however, vital in providing knowledge and input into the strategic formulation and execution within the film industry. With the help of sentiment analysis, filmmakers receive useful information that helps them create content that will meet the audience's expectations and interests. This approach ensures that storytelling has the desired impact on the audience, most importantly improving satisfaction. For instance, recognizing positive attitudes towards specific characters, plot twists, or visuals gives rather obvious pointers to the strategies that should be followed. Such revelations may help filmmakers focus on aspects that viewers appreciate most, which raises chances of attaining the attention and

engagement of the observers. Furthermore, the analysis of negative aspects benefits studios by providing the means to prepare for concerns or negative remarks. By choosing this approach, the quality of the film is enhanced, and at the same time, possible risks that may hamper the viewers' reception of the movie are avoided.

When applied to the top-level narrative and aesthetic decisions, sentiment analysis can offer studios the opportunity to think critically about the narrative progress and refer to the data-based analysis of the aspects of their work that cannot be observed in the common feedback processes. This means that every decision made by filmmakers will be logic-based and will reach out to the target group in a more realistic manner, hence making the whole concept of the film more successful. Therefore, the analysis of this type of data helps to raise the creativity level as well as increase Chinese animated movies' competitiveness in the global market.

Furthermore, sentiment analysis serves as an advantage to studios because it allows them to improve their marketing techniques and promote audience engagement programs. Using actual trends of sentiment analysis, studios can sell and promote more relevant content that will be appealing to their target audience. This analytical and data-oriented approach not only enhances the marketing ROI but also strengthens the bond between movie makers and audience. In addition, by being attentive and understanding the different audiences' sentiments and preferences more profoundly, studios can generate topics which can meet and even go beyond the expectations of the viewers, which will then form a community of supportive fans who feel appreciated by the studios. Such a mutually beneficial relationship between content creators and the viewers strengthens brand recognition and continuous engagement, which is beneficial for business in the long run and essential to succeeding in the saturated animation market.

## 6. Discussion

The analysis of audience feedback using sentiment analysis algorithms has provided valuable insights into viewer perceptions and sentiments towards Chinese animated movies. This discussion synthesizes the findings from the study, addresses the implications for the Chinese animation industry, and explores avenues for future research and application. The results indicate a predominantly positive reception among audiences towards Chinese animated movies, with 63% of sentiments categorized as positive. This finding underscores the growing popularity and cultural significance of domestically and internationally Chinese animation. Positive sentiments are often associated with themes that resonate deeply with Chinese cultural heritage, such as folklore, mythology, and moral teachings. These elements enrich storytelling and enhance audience engagement and emotional connection with the narrative. The study evaluated three primary sentiment analysis algorithms: VADER, Support

Vector Machines (SVM), and Recurrent Neural Networks (RNNs). RNNs demonstrated the highest performance metrics, achieving an accuracy of 85%, which highlights their effectiveness in capturing nuanced sentiments and contextual nuances in Chinese language text. SVM also showed robust performance with an accuracy of 82%, indicating its suitability for sentiment classification tasks in the context of animated movie reviews. VADER, a lexicon-based approach, while effective, exhibited slightly lower performance metrics compared to the machine learning models.

The findings have significant implications for filmmakers, studios, and industry stakeholders involved in producing and distributing Chinese animated movies. By leveraging sentiment analysis insights, studios can refine content strategies, tailor storytelling techniques, and anticipate viewer expectations more effectively. Understanding audience sentiments towards specific themes, characters, and visual styles can guide decisions in script development, character design, and marketing campaigns, thereby optimizing audience engagement and maximizing commercial success. Despite the advancements in sentiment analysis technology, several challenges remain. The nuances of the Chinese language, including regional dialects and cultural references, pose complexities in sentiment classification. Moreover, the dynamic nature of online discourse and evolving viewer preferences require continuous adaptation of analytical models and methodologies. Future research could explore ensemble approaches integrating multiple algorithms or deep learning techniques to further enhance the accuracy and granularity of sentiment analysis in the context of Chinese animated movies. Ethical considerations regarding data privacy and responsible use of user-generated content are paramount in sentiment analysis research. Measures such as anonymization of data, obtaining informed consent, and adhering to ethical guidelines ensure the integrity and validity of research findings while safeguarding the rights and privacy of individuals contributing to the dataset. Upholding ethical standards is crucial to maintaining trust and credibility in research practices involving sensitive information from online platforms.

Future research endeavours could build upon the current study by incorporating longitudinal analyses to track evolving audience sentiments over extended periods. By examining sentiment trends over time, researchers can uncover how viewer perceptions of Chinese animated movies shift in response to cultural, societal, or technological changes. Comparative studies across various genres or demographic segments would further enrich our understanding of audience preferences and cultural dynamics influencing viewer reception. Such comparative analyses could elucidate which narrative elements or thematic motifs resonate most strongly with different audience groups, thereby informing more targeted content creation strategies and marketing approaches. Integrating sentiment analysis with complementary analytical

frameworks, such as content analysis or network analysis, holds promise for offering a more comprehensive understanding of audience engagement and narrative impact in Chinese animation. Content analysis could provide deeper insights into the thematic content and stylistic elements that correlate with positive or negative audience sentiments. Meanwhile, network analysis could illuminate the interconnectedness of viewer interactions and discussions across online platforms, offering insights into how social dynamics influence collective audience perceptions.

## 7. Conclusion

The research looked at the general perception of Chinese animated movies to find out that the majority of the feedback was positive; of the total positive feedback, 63% expressed appreciation of Chinese folklore, mythology, and moral values. Such elements contribute greatly to the ability to tell a story and to make audiences relate with characters, which is why the industry is expanding not only locally but internationally as well. Out of all the algorithms used for the sentiment analysis, the Recurrent Neural Networks (RNNs) were found to be the most accurate, with an accuracy level of up to 85%, which shows improved ability at deciphering subtler sentiments from the Chinese language texts. SVM also yielded good results with an accuracy of 82%, which proves its effectiveness for sentiment classification, particularly for movie reviews. This research work has enlightened on the increasing importance and entrainment value of Chinese Animation as enjoyed by the domestic and international markets. The outcome of this study shows how the sentiment analysis algorithms applied to textual data gathered from Facebook and social networking sites, as well as movie review websites, can help decipher the viewers' complex sentiments and preferences based on an analysis of textual data. According to the study, most of the audiences' perception towards Chinese animated films is positive, and the audience embraced stories based on Chinese traditional values, fables, myths, and ethics. Good audience response mostly depends on the exciting plot, the application of new technologies in animation, and the revealing of the character's emotions and conflicts, which emphasizes the industry's ability to attract viewers from different backgrounds and touch their hearts with the help of storytelling. The developed sentiment analysis algorithms applied in this research include RNNs, which have been found to have a high impact on the classification of sentiments. This goes a long way in explaining how the algorithm can pick features from Chinese language text and be in a position to capture context-dependent sentiments that enhance understanding of audience response. Other machine learning models, such as the Support Vector Machines (SVM), also exhibited reliability in the analysis of the viewers' sentiments depending on the genre and aspects of the animation movies.

It is equally important for filmmakers, animation studios and distributors to get sentiment analysis insights. This will



help them enhance the production, techniques used in telling the story, and the campaigns they are implementing based on what the audience has to say. Knowledge of attitudes toward narratives and visuals helps to make appropriate decisions in script creation, character creation, and advertisement and contributes to audience appeal and commercial success. For further research, it may be important to look at the trends that occur in the way that audience sentiments change in the subsequent years, taking cultural transformation and technology improvements into perspective. Hypothetically, cross-genre comparisons or comparisons of the results of domestic and international studies could shed more light on differences and thus help adjust content plans more finely.

Also, future research could be conducted using ensemble methods or hybrid models together with or incorporating other algorithms, including RNN, SVM and VADER, to improve the overall accuracy of the sentiment classifier, particularly about the Chinese dialects and culture. As for practical applications, the identified sentiment analysis results should be incorporated into filmmaking and related studios to create and promote the films that would fit the audience's demands for content, ultimately increasing its popularity among viewers and sales among producers. Important moral issues include the protection of the data's privacy and the proper consent for data surveys to preserve and continue developing the industry's credibility.

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