EMOTIONAL EVALUATION OF MOVIE POSTERS

Takashi Hanagaki and Jun Iio

Faculty of Global-Informatics, Chuo University, 1-18 Ichigaya-Tamachi, Shinjuku-ku, Tokyo, 162-8478, Japan

ABSTRACT

This study examines the impressions that movie posters give people and analyzes movie poster trends. The primary objective was to determine whether movie posters have any characteristics, which was done through clustering using arousal–valence maps. Thereafter, we tried to determine whether these characteristics are related to other indicators, such as box office revenue and audience satisfaction. A prototype of the proposed emotion evaluation system to conduct the survey was implemented, and an its overview and functions were elucidated. The system randomly displayed 6 movie posters from a list of 100 poster images prepared in advance. A small case study was conducted wherein participants were asked to rate each poster, and their ratings were saved. The evaluation values were analyzed, and several findings were obtained.

1. INTRODUCTION

Advertising is widely used by companies to promote their products and work. There are several types of advertising, such as TV commercials, internet advertisements, and movie posters. Posters are known to influence and increase the interest of moviegoers. Recently, with the advent of over-the-top media services such as Amazon Prime Video and Netflix, people are offered more opportunities to decide whether to watch a movie based on its poster, which suggests that the impressions they acquire through movie posters can influence their viewing.

This study focused on movie posters and analyzed their impressions on people. Participants' impressions of each poster were collected using a questionnaire and quantitatively evaluated. This study introduces an emotion evaluation system that was developed to conduct the questionnaire, and reports the results of the data analysis performed using the data generated through this system.

The system adopted the arousal–valence (AV) index proposed by the psychologist James A. Russell (1980). Arousal involves evaluating the activation performance of an object; for example, whether it imparts a calm feeling or makes an individual nervous when they see it. In contrast, valance involves evaluating positivity/negativity, that is, whether the impression obtained when looking at the object is anxious, sad, confident, or happy. The primary objective of this study was to determine some characteristics of movie posters and to achieve this goal, clustering was performed using the aforementioned (AV) map. Subsequently, we expected to gain insight into whether these features are related to other indicators, such as box office revenue and audience satisfaction.

The following are some previous studies related to this research:

Kutsuzawa et al. (2022) analyzed the relationship between emojis, which are frequently used worldwide to express feelings and emotional states. Using the emotional value-arousal scale, they determined that emojis comprehensively express human emotions.

Kato (2022) evaluated the arousal and emotional valence for images selected from the International affective picture system dataset. The measured arousal and emotional valence differed among the cases wherein participants were instructed to rate the emotion aroused by the stimulus and those wherein they were instructed to identify the sentiment contained in the stimulus.

Kimura et al. (2020) aimed to create a list of stimulus words suitable for emotional arousal. They presented university students with two-character phrases and asked them to rate the emotional valence and arousal level

imparted by each phrase. Consequently, they created a list of emotional words that minimized the interdependent effects of emotional valence and arousal levels.

Goto (2019) investigated the emotional valence and arousal levels of single-kanji characters to create an emotion word list. The 7-point Likert scale survey included 45 students and a list of 95 words selected from Kanji in contemporary magazines. Consequently, 29, 33, and 30 words were assigned negative, positive, and neutral values, respectively.

Sasaki et al. (2013) recommended songs that matched the impression of a scene by mapping the input image to the song impression. In this method, the image and music features were transformed into AV value, which is a psychological index of liveliness, to map them in the AV space.

Although most of these studies have evaluated emotional valence and arousal of words, this study attempted to do this for images.

2. EXPERIMENT AND RESULTS

This section provides an overview of the experiment and inferences of the results obtained.

2.1 Experiment Overview

An experiment was conducted to determine the impressions movie posters make on people. The experimental system was designed to randomly display 6 movie posters from a list of 100 different movie posters prepared in advance, and participants were asked to rate the impression they obtained from each image. The poster images were obtained from an online database called the Movie Database (TMDB). By using the application programming interface of this website, various information about any movie can be collected, such as the country of production, year of production, names of actors, and satisfaction level. Moreover, it is possible to collect information and posters of all movies around the world. The 100 poster images prepared in advance were those of the top 100 movie titles according to their world box office revenue rankings. The terms and conditions of use of TMDB allow free use of movie poster images. It was confirmed that no intellectual property rights were infringed.

The AV index was used to evaluate the posters. Because Russell's model plots various emotions on two axes, each AV value could be represented as a 2D representation of the corresponding emotion. The average AV values for the posters were calculated from the accumulated results, which were analyzed by applying them to the corresponding emotions.

2.2 Emotion Evaluation System

The emotion evaluation system randomly displayed 6 movie posters out of the selected 100 movie posters, and stored the arousal and emotional values entered by the users.

After a participant completed the evaluation, the system showed them other participants' scores, which was expected to impart gamification. Thus, users could intuitively identify the differences between their and others' scores, which was intended to encourage them to assess other posters.

The jQuery-UI and Bootstrap 5 CSS libraries were used at the front end, and the back end (server side) was built using the Rails 7.0.2.3 framework. Figure 1 shows a screenshot of the evaluation system, which shows six posters randomly selected from TMDB.
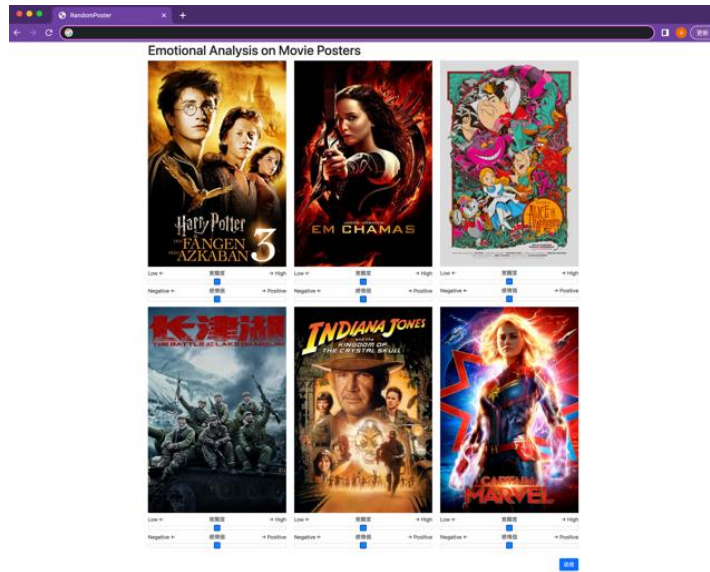
Figure 1. Evaluation system called "Emotion Analysis for Movie Posters"

2.3 Experiment and Result Analyses

The experiment was conducted using a previous system on May 16, 2022. Twenty members of our laboratory participated in this study, and their multiple responses resulted in 372 evaluation results. The results were displayed in the format of Russell's model, with the vertical axis representing arousal level and the horizontal axis representing the emotional valence (Figure 2).
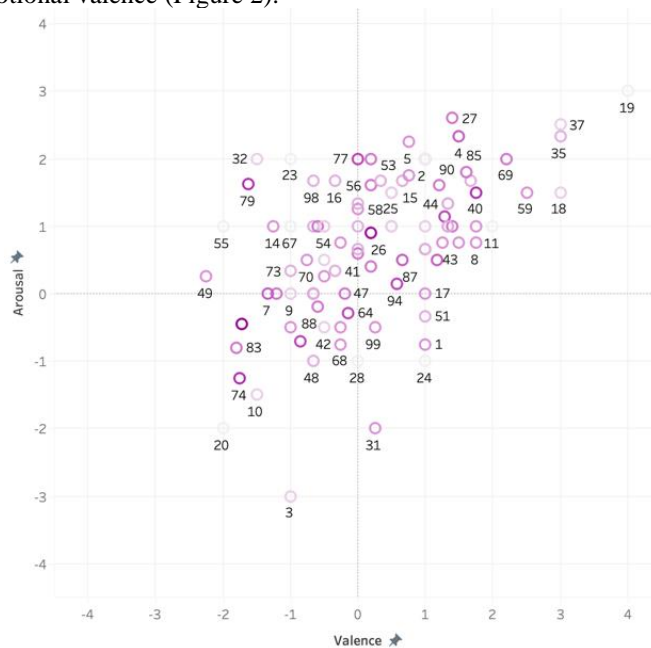

Figure 2. Scatter plot of emotion evaluation

The colored circles indicate the number of evaluations; the darker the color, the more times the assessment was made, and the higher the evaluation validity. The numbers displayed near the circles indicate box office rankings. For example, item 1 indicates the movie with the highest box office revenue, whereas item 100 indicates the one with the lowest.

Three findings were obtained through this experiment. First, there is a positive correlation between arousal and valence; the correlation coefficient was 0.513, indicating that there was indeed a correlation. Second, currently there is no direct correlation between the evaluation value of posters and box office revenue. The numbers in the graph indicate the box office revenue rankings; however, large and small numbers are scattered. Third, very few posters were rated as having low arousal and positive valence. The following figure shows the number of poster images in each quadrant. The number of posters evaluated as having low arousal and positive valence, that is, in the fourth quadrant, was only five, which was lower than in the other quadrants. The following hypothesis is proposed based on these results: there is a lower number of posters in the fourth quadrant for some reason (e.g., they do not lead to sales) and participants rarely evaluated the posters in this quadrant. Because the evaluation hurdle was high in this quadrant, posters were rarely classified in this area.

3. CONCLUSIONS AND FUTURE WORK

This study attempted to examine the impressions that movie posters impart to people. The characteristics and trends of movie posters were analyzed by clustering them using AV maps and examining whether these characteristics were related to other indicators, such as box office revenue and audience satisfaction. The evaluation system was constructed based on Russell's AV model, and an experiment was conducted using the proposed system. The data obtained were mapped and analyzed using the AV model. The results did not show a correlation between the evaluation value and box office revenue, and posters rated as having low arousal and positive valence tended to be less favored than others.

Although this study was conducted using movie posters, the vital outcome is the evaluation system that was created. In other words, this system does not have to be limited to movie posters, and could be used to evaluate paintings, brand advertisements, etc. Because this study evaluated the impression people acquire when they see an object, we believe it can be used to anticipate user experience. We hope that this study will aid future research in this field.

However, more experiments are required to ensure the validity of the evaluation values. Therefore, it is expected that the number of evaluations can be increased in the future by recruiting students from the same faculty as participants (our faculty has approximately 600 students). Additionally, a similar experiment should be conducted using posters of movies that did not have high box office collections and its results should be compared with those obtained in this study. We will continue to examine the relationships between the evaluation results. Because this study did not find a direct relationship with box office ranking, we plan to investigate the correlation between the number of PV views and the level of audience satisfaction in future work.

REFERENCES

Gotoh, F., 2019, Affective Valence and Arousal from Single-character Kanji Words. *Bulletin of DEN-EM-CHOFU UNIVERSITY* 14, 35–49.

Kato, M., 2022, Comparison of different ratings of arousal and emotional valence for emotional stimuli. *Tama University journal of management and information science* 26, pp. 69–79.

Kimura, T. and Suzuki, N., 2020, Development of a list of emotional words comprising two-character idioms. *Japanese Journal of Research on Emotions.* 27(2), pp. 43–50.

Kutsuzawa, G., et al, 2022, Classification of 74 facial emoji's emotional states on the valence-arousal axes. *Sci Rep* 12, 398.

Russell J. A, 1980, A Circumplex Model of Affect; *J. of Person. and Soc. Psychol.* 39(6), pp. 1161–1178.

Sasaki, S., et al, 2013, Affective Music Recommendation System based on Input Image. *Information Processing Society of Japan.* 75(1), 45–46.