Predicting Movie Ratings from Audience Behaviors on Movie Trailers

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Abstract—Movie rating is a measure of viewer's reaction to movie performance at the box office and also a key feature to garner publicity. Movie ratings are feedback measures given by a subset of the audience voluntarily. If the degree of effect on the human mindset can be measured through real-time behavior analyzing and rated, the results can help film houses to understand the secret of generating a commercial success movie. Prediction of movie ratings is a complex problem. Viewers, producers, directors, and production houses are curious about how a given movie will perform in theatres with different customer segments. Research works have been carried out relating to movie rating prediction using social networking, blogs articles, but much less has been explored by the consumer behavioral data and attributes while watching a movie continuously and using emotions and body movement dimensions [1 – 4], [7], [12]. We created an audience footage data set and transformed it into numerical feature data representing the audience's behavior. Prepossessing and machine learning approaches were applied to build an efficient model that can predict the movies' popularity.

Index Terms—Face Clustering, Face Verification, Classification, Multilayer Perceptron (MLP), K-Nearest Neighbors (kNN), Support Vector Machine (SVM), Action Unit (AU), OpenCV, VLC ActiveX, Encoding

I. INTRODUCTION

Movie rating is a measure of the viewer's influence on movie popularity and also a key feature of publicity. On online evaluations, the audience provides a voluntary rating for movies accordingly to their overall experience. The degree of effect on humans by a particular video can be extracted through real-time behavior analysis.

Good movies lose out the chance to screening in some theatres under several constraints, This is a major challenge on ticket bookings. If movie producers have a reliable platform to predict the movie rating which is an additional gauge of the performance, will be helpful to pitch the movie.

Prediction of movie ratings is a very challenging problem. In this work continuous behavior of the viewer through the duration (100-180 seconds) of the movie trailer is recorded and prepossessed to apply machine learning techniques.

Generally, trailers of the movies are published before finalizing the production. So movie producers can apply subtle modifications to the movie, if a movie rating prediction is available. Predicting the result for a particular movie can help film houses to understand, the secret of generating a commercial successful movie. Understanding the important factors that make a movie successful will be helpful to the movie directors, to make their movies cater to the audience. Also, the film distributors can select the appropriate movies from early known audience admiration by predicted movie ratings.

There are different ways a human expresses his/her emotions, as well as expressing them verbally, expressing the emotions also involves non-verbal means and sensor detectable actions. In human-to-human interaction, no matter which language we speak, or which cultural background we come from, or which age group we belong to, we all use face, hands, and body as integral parts of our interpersonal communication. Face expressions and gestures change continuously and spontaneously accompanying our speech [8]. Recent years have seen an increased interest in machine analysis of faces [9], which includes understanding and recognition of affective and cognitive mental states and interpretation of social signals. As the face is an important channel of nonverbal communication, facial behavior analysis has been used in different applications (thieves' detection system, mobile device protection, drowsiness detection) to facilitate human-computer interactions [4]. Hence, emotion energy can be analyzed, by implementing a framework for a vision-based multi-modal analyzer, that combines face and body gestures.

In our research, we use individual viewer–level data to predict the communities' satisfaction of the movie. The film companies will have to find various aspects of movie ratings, capturing viewers' complacency of a new movie. Furthermore, viewers' expressions will varies over the movie trailer screening time, and capturing this variation lead to better movie rating prediction.

Here, we measure the audience's facial and body movements while watching a movie trailers, using a web camera and analyze the result using machine learning techniques, to predict the rating of the movie. Our main focus, is on the facial features which consist of facial landmark location, head pose, eye gaze, and facial expressions. Each of these behaviors, plays an important role together and individually. Facial landmarks allow us to understand facial expressions, motions, and its dynamics. Also allows face alignment for various tasks such as gender detection and age estimation.