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A Review on Facial Expressions

Prof. Bharati Kale¹, Sagar Kasabe², Dipak Ingale², Ranjit Chavan², Omkar Pandhare²

Professor, Dhole Patil College of Engineering, Wagholi, India¹

Student, Dhole Patil College of Engineering, Wagholi, India²

ABSTRACT: It is very time consuming and difficult to create and manage large playlists and to select songs from these playlists. Thus, it would be very helpful if the music player itself selects a song according to the current mood of the user. The most natural way to express emotions is using facial expressions. Facial expression provides current mind state of person. Facial expression is an important channel for human communication and can be applied in many real applications. An application can be developed to minimize the efforts of managing playlists. In this paper, we will study about how to automatically detect the mood of the user and present him a playlist of songs which is suitable for his current mood.

KEYWORDS: Music player, Face Detection, Facial Expression Recognition.

I. INTRODUCTION

Recognition of facial expressions is used to identify the basic human emotions. Facial expressions give important clues about emotions. Computer systems based on affective interaction could play an important role in the next generation of computer vision systems. Face emotion can be used in areas of security, entertainment and human machine interface (HMI). A human can express his/her emotion through lip and eye.

Generally people have a large number of songs in their database or playlists. Thus to avoid trouble of selecting a song, most people will just randomly select a song from their playlist and some of the songs may not be appropriate for the current mood of the user and it may disappoint the user. As a result, some of the songs are not matching to the user's current emotion. Moreover, there is no commonly used application which is able to play songs based on the current emotions of the user. Music plays a very important role in enhancing an individual's life as it is an important medium of entertainment for music lovers and listeners and sometimes even imparts a therapeutic approach. In today's world, with ever increasing advancements in the field of multimedia and technology, various music players have been developed with features like fast forward, reverse, variable playback. Although these features satisfy the user's basic requirements, yet the user has to face the task of manually browsing through the playlist of songs and select songs based on his current mood and behavior.

In this paper, we aim for improving the performance of FER by automatically capturing facial movement features in static images based on distance features. The distances are obtained by extracting "salient" patch-based Gabor features and then performing patch matching operations. Patch-based Gabor features have shown excellent performance in overcoming position, scale, and orientation changes [15], [16], [17], as well as extracting spatial, frequency, and orientation information.

Recognition system is classified into three parts:

First step is based on preprocessing. In preprocessing filtering, ROI, histogram-equalization, edge detection are applied on input face image. Secondly eye, eyebrow and lip features have taken from processed input image.

In third stage optimized parameters such as eye, eyebrow and lip are calculated through the Genetic algorithm and then emotions (neutral, happy, sad, surprise) are classified using artificial neural network and GINI index approach.

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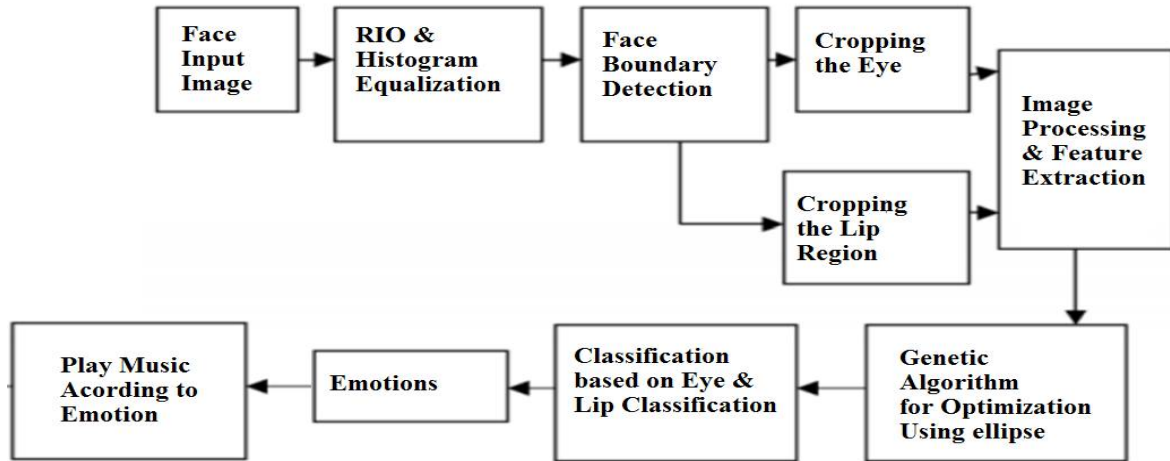


Fig: Architecture Diagram

Numerous approaches have been designed to extract facial features and audio features from an audio signal and very few of the systems designed have the capability to generate an emotion based music playlist using human emotions and the existing designs of the systems are capable to generate an automated playlist using an additional hardware like Sensors or EEG systems thereby increasing the cost of the design proposed. Some of the drawbacks of the existing system are as follows :

- i.Existing systems are very complex in terms of time and memory requirements for extracting facial features in real time.
- ii.Based on the current emotional state and behavior of a user, existing systems possess a lesser accuracy in generation of a playlist.Some existing systems tend to employ the use of human speech or sometimes even the use of additional hardware for generation of an automated playlist, thereby increasing the total cost incurred.

This paper primarily aims and focuses on resolving the drawbacks involved in the existing system by designing an automated emotion based music player for the generation of customized playlist based on user extracted facial features and thus avoiding the employment of any additional hardware. It also includes a mood randomized and appetizer function that shifts the mood generated playlist to another same level of randomized mood generated playlist after some duration.

II. Literature Survey

Sr. No	Paper Title	Application	Year of publication	Author
1	Facial Expression Recognition Using Facial Movement Features	Ease of use	OCTOBER-DECEMBER 2015	Ligang Zhang
2	Emotion Recognition from Facial	Used in vehicles	OCT-NOV 2014	Ira Cohen, Ashutosh Garg,



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	Expressions using multilevel			Thomas S. Huang
3	Observer-Based Measurement of Facial Expression With the Facial Action Coding System	It used authentication purpose	OCT-NOV 2014	Jeffrey F. Cohn, Zara Ambadar, Paul Ekman
4	Observer-Based Measurement of Facial Expression With the Facial Action Coding System	User friendly	OCT-NOV 2014	Jeffrey F. Cohn, Zara Ambadar, Paul Ekman
5	Real-Time 2D+3D Facial Action and Expression Recognition	Expression recognition	OCT-NOV 2010	F. Tsalakanidou and S. Malassiotis,
6	Simultaneous Facial Action Tracking and Expression Recognition in the Presence of Head Motion	Tracking emotions	NOV 2008	F. Dornaika and F. Davoine,
7	Automatic Prediction of Frustration	Automatic prediction of expression	OCT 2007	A. Kapoor, W. Bursleson, and R.W. Picard
8	Joint and Implicit Registration for Face Recognition	Face recognition	NOV 2009.	L. Peng and S.J.D. Prince,
9	"Human Computing and Machine Understanding of Human Behavior: A Survey," Artificial Intelligence for Human Computing, vol. 4451, pp. 47-71, 2013	Artificial intelligence	DEC 2013	T. Huang, A. Nijholt, M. Pantic, and A. Pentland,
10	Multiclass Object Recognition with Sparse, Localized Features," Proc. IEEE CS Conf. Computer Vision and Pattern Recognition, pp. 11-18,	Recognition with sparse features	NOV 2006.	J. Mutch and D.G. Lowe,
11	"Dynamics of Facial Expression Extracted	Expression extraction from video	OCT 2006	G. Littlewort, M.S. Bartlett, I.



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	Automatically from Video,” Image and Vision Computing, vol. 24, pp. 615-625,			Fasel, J. Susskind, and J. Movellan,
12	“A Face Emotion Tree Structure Representation with Probabilistic Recursive Neural Network Modeling,” Neural Computing and Applications, vol. 19, pp. 33-54, 2010.	Neural network	NOV 2010	J.-J. Wong and S.-Y. Cho,

III. CONCLUSION AND FUTURE WORK

Genetic algorithm gives optimized value of eye, eyebrow and lip feature. Then this gives input to the neural network and we get emotions. Thus the application developed will reduce the efforts of user in creating and managing playlist. It will provide better enjoyment to the music listeners by providing the most suitable or appropriate song to the user according to his/her current emotion. It will not only help user but also the songs are systematically sorted.

Future Scope for Implementation:

- Facial recognition can be used for authentication purpose.
- Android Development.
- Can detect sleepy mood while driving.
- Can be used to determine mood of physically challenged & mentally challenged people.

IV. ADVANTAGES

- User Friendly
- Ease to use
- Improved accuracy
- Reduced computing time.

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