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A Roadmap of Raajan's Computer Aided Psychological Design [Rcapd] Model for Emotional Identification for Personality Examination With Face Based Features

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Abstract:In the present era computer algorithms and application programs dominates in every field of human survival. Due to the influence of images in the information processing system; digital image processing evolved in a volcanic sprit in the identification, recognition, and enhancement, especially in image searching and retrieval. With this strong tempo various methods has been developed and trying to achieve its accuracy in war horse manner. But there is lack in knowledge based representation of image based on its visual contents. In this paper, we have designed a RCAPD (Raajan's Computer Aided Psychological Design) model to examine the personality based on his/her emotions with the corresponding face images. Also this paper made an innovation in the integration of image processing with the psychological aspects using the image contents. In this method the image gets pre-processed and the face features viz., Geometrical, texture, edge and other features in the generation of feature set. Based on the analysis on the extracted features the emotional intelligence are been evaluated and the type of emotion analysed in the image is reported. According to psychological theories various emotional traits can be represented this face based features. This novel methodology can be experimented using MATLAB and the performance of this methodology can be evaluated and can compare with the existing methods.

Keywords: Face recognition. Emotional Intelligence, Feature set, Pre-Process, RCAPD.

1. INTRODUCTION

In the present world computer technology replaces more manual assignments and makes it into automation. It is a machine oriented technology which nurtures the process of machine information technology. Generally, it takes a data as input and processes it; based on the input along with the processing algorithm it produces the output. Now-a-days information processing developed from low-level features high level features. It is also enters into the field of human inter personal traits scientifically.

In this paper we, made a novel methodology that permits the human psychology to enter into the process of information processing systems. Every individual who exists in the world has their own psychology it may vary from person to person. Hence, it is very tedious task to analyse the psychological content of human beings. It is very difficult ti correlate the psychological features and psychological or biometric features in decision making behavioural process.

Digital image processing enters into the digital world in various sectors such as security, Authentication, E-Learnings. Among them face recognition is a crucial area in image processing. In the earlier system human face is used for identification and authentication purposes. It is also used in content based image retrieval system. We made a innovation by integrating the information technology with psychological concepts.

Mainly, this paper concentrated to make psychological decisions based on the emotions, mood and other psychological features of human beings. The decision will be taken by processing the face based images. It is the initial point of our research to lead a long journey to find the behaviour or mental contents of the person and process it towards a positive attitude development for a better happy life. This paper is organized as the Introduction in section I followed by section II related work , Methodology and proposed methodology in section III, Experimentation in section IV followed by Conclusion in section V and VI as for future work.

2. RELATED WORKS

[1] Describes a like holistic matching method, feature extraction method and hybrid methods of face recognition. It is our opinion that research in face recognition is an exciting area for many years to come and will keep many scientists and engineers busy.

[2] Proposed compression based face recognition using Discrete Wavelet Transform (DWT) and Support Vector Machine (SVM). The DWT is applied on averaged face image to obtain approximation (LL) and detailed bands. The LL coefficients of DWT and SV's are fused based on arithmetic addition to extract final features.

[3] These systems become possible due to technological advancement in the fields of automated face analysis, machine learning and pattern recognition.

[4] several authentication techniques including traditional and biometric but has some drawbacks. A new face recognition system (FRS) which overcomes all drawbacks of traditional and other biometric authentication techniques and enables only authorized users to access data or services from cloud server.

[5] The robustness of the system can be obstructed by humans who alter their facial features through wearing colored contact lenses, growing a mustache, putting on intense make-up, etc. Ethical concerns are also related to the process of recording, studying, and recognizing faces.

[6] a contour matching based face recognition system is proposed, which uses "contour" for identification of faces. The feasibility of using contour matching for human face identification is presented through experimental investigation. The advantage of using contour matching is that the structure of the face is strongly represented in its description along with its algorithmic and computational simplicity that makes it suitable for hardware implementation. The input contour is matched with registered contour using simple matching algorithms.

[7] A technique for human identification using fusion of both face and speech using principal component analysis (PCA) as feature extraction techniques which calculate the Eigen vectors and Eigen values. The Mel-Frequency cestrum coefficients (MFCC) feature extraction techniques are used for speech recognition in our project. Cross correlation coefficients are Considered as primary features. The Hidden Markov Model (HMM) is used to calculate the like hoods in the MFCC extracted features to make the decision about the spoken wards.

[8] A Conventional method of identification based on possession of ID cards or exclusive knowledge like a social security number or a password are not all together reliable. Face recognition technology may solve this problem since a face is undeniably connected to its owner expect in the case of identical twins. It's non-transferable. The system can then compare scans to records stored in a central or local database or even on a smart card.

[9] A survey of face recognition methods exhibit and discuss their pros and cons.

[10] A primordial role of emotions on `high-level' cognitive processes. a possible architecture for a system able to acknowledge the interface between affect and cognition and to provide multimodal intelligent feedback and pointed out some of the issues involved in automatic facial expression recognition from an interdisciplinary perspective between HCI, AI, and Cognitive Science.

[11] Exploratory factor analysis was used to extract 5 factors of emotional intelligence based on Daniel Goleman model. The items were further validated using face, content, and construct, concurrent and convergent validity. Cronbach's alpha scale was used to find the reliability of the emotional intelligence self report measure.

[12] A measurement instrument developed from the ability model of EI the Mayer-Salovey-Caruso Emotional Intelligence Test. The four subtests, scoring methods, psychometric properties, reliability, and factor structure of the MSCEIT with a special focus on the discriminant, convergent, predictive, and incremental validity of the test. A review associations between MSCEIT scores and important outcomes such as academic performance, cognitive processes, psychological wellbeing, depression, anxiety, prosocial and maladaptive behavior, and leadership and organizational behavior.

[13] The concept of Emotional Intelligence (EI) has generated unparallel interest both in the lay and scientific fields; it has also become a topic of rapid interest for researchers and academicians. The present study is an attempt to summarize the literature available on EI by discussing the evolution of the term Emotional Intelligence and various definitions of EI. It also clarifies the concept of EI by reviewing different models of EI and discussing the various measures used to access EI.

[14] As the pace of change is increasing and world of work is making ever greater demands on a person‟s cognitive, emotional and physical resources, this particular set of abilities are becoming increasingly important. An attempt were made to make a clear understanding regarding the concept, nature, models and implication in the field of education, which will be helpful for in the field of education (in classroom). Though this concept is popular in western country, Indian views regarding EI has also been analysed in this present paper.

[15] Presents two experiments concerning trait emotional intelligence ('trait EI'). In study 1, ten high and ten low trait EI individuals were selected from a sample of 85 persons to participate in a computerized experiment involving the recognition of morphed emotional expressions. As hypothesized, high trait EI participants were faster at identifying the expressions than their low trait EI counterparts. As hypothesized, high trait EI participants exhibited greater sensitivity to the mood induction procedure than their low trait EI counterparts.

[16] The aim of the study was the evaluation of facial emotion perception and its relation to the psychotic symptoms in schizophrenia patients. Psychical condition was assessed with following diagnostic tools: CGI (Clinical Global Impression Scale), PANSS (Positive and Negative Syndromes Scale), CDSS (Calgary Depression Scale for Schizophrenia), UKU (Side Effect Rating Scale). Facial emotion recognition ability was assessed by SIE-T (Emotional Intelligence Scale – Faces).

[17] Metacognition of emotion recognition can also be assessed using relative measures that evaluate how well a person thinks s/he has understood the emotion in a particular facial display as compared to other displays. While this is the most common method of metacognitive assessment of people's judgments of

learning or their feelings of knowing, this kind of metacognition—"relative meta-accuracy"—has not been studied within the domain of emotion. global meta-accuracy was unpredictive of performance, relative meta-accuracy, given by the correlation between participants' trial-by-trial metacognitive judgments and performance on each item.

[18] A new ERA test (Geneva Emotion Recognition Test [GERT]) that (a) features dynamic and multimodal actor portrayals (short videos with sound), (b) contains a large number of emotions, and (c) is based on modern psychometric principles (item response theory).

3. METHODOLOGY

3.1 Face recognition

3.1.1 Texture Feature

In order to retrieve images, we must be able to compare two images to determine the similar contents. An efficient matching scheme further depends upon the discriminatory information contained in the feature vectors of the images. Let I = $\{I_1, I_2, \ldots, I_N\}$ be the sequence of all gray-level images in an image database (IDB). Thus each I_i denotes a gray-scale image of size (M × N) with pixel values in the range 0 to 255. A grayscale input image I_i of size (M × N) from the image database is considered for the extraction of feature vectors and is divided into *k* sub-images of size (n × n). viz. S_1, S_2, … S_k using the formula:

$$k = 2^{2(n-1)}$$

where n <= M,N, the feature vectors of the images are extracted on the basis of the auto correlation coefficients with horizontal and vertical directionality features.

The Feature vectors of each sub-images are computes with the positional differences (p, q). Hence, the Feature Matrix (F_k) of the kth sub-region of the input image with the positional differences (r, s) is extracted and auto correlation co-efficient values of kth block are converted into autonums with the value ranges 0 to 100 and are represented into feature matrix as shown below:

$$F_k = \begin{bmatrix} C_{ff}(0,0) & C_{ff}(0,1) & \cdots & C_{ff}(0,q-1) \\ C_{ff}(1,0) & C_{ff}(1,2) & \cdots & C_{ff}(1,q-1) \\ \vdots & \vdots & & \vdots \\ C_{ff}(p-1,0) & C_{ff}(p-1,0) & \cdots & C_{ff}(p-1,q-1) \end{bmatrix} \quad \ldots (3.1)$$

The values obtained with the feature matrix of each block are considered as the auto correlation features. In addition to these features, the horizontal and vertical directionality features are extracted to generate the feature set.

3.1.2 Edge Based Feature

In this methodology the canny edge descriptor is well suitable in the extraction of edge based feature. 1. Detection: The probability of detecting real edge points should be maximized while the probability of falsely detecting non-edge points should be minimized. This corresponds to maximizing the signal-to-noise ratio. 2. Localization: The detected edges should be as close as possible to the real edges. 3. Number of responses: One real edge should not result in more than one detected edge (one can argue that this is implicitly included in the first requirement). With JFC's mathematical formulation of these criteria, Canny's Edge Detector is optimal for a certain class of edges (known as step edges).

3.2 Psychological Aspects

3.2.1 Facial Expressions and Facial Displays[19]

The face has been to correlate movements of the face with emotional states. the "Emotion View", are not all homogeneous in all their opinions, but they do share the conviction that emotions are central in explaining facial movements The "Behavioral Ecology View", on the contrary, derives from accounts of the evolution of signaling behavior, and does not treat facial displays as expressions *of emotions*, but rather as *social signals of intent* which have meaning only in social context. More recently facial expression has also been considered as *emotional activator*, contrary to being viewed solely as a response to emotional arousal

3.2.2. Emotion View:

The Emotion View posits two basic kinds of facial actions. The first are the innate reflex-like facial actions that read out on going emotion, and display them with facial expressions of emotions. The second are learned instrumental facial actions that connote emotion that is not occurring, and reflect everyday social dissimulation such as the smile of politeness. In everyday life, the facial expressions observed are an interaction of emotional response and cultural convention. The Emotion View proposes a small set of fundamental emotions that are reflexes or "affect programs"

differentiated by natural selection, triggered by stimuli and accompanied by prototypical facial displays.

Six basic emotions identified by their corresponding six universal expressions, and referred to with the following linguistic labels have been proposed (Ekman and Friesen 1975): *surprise, fear, anger, disgust, sadness,* and *happiness*. Recently *contempt* has also been counted among universal expressions as well.

3.3 Proposed Raajan's Computer Aided Psychological Design

In the previous section various literature based on the face recognition, feature extraction and emotional Intelligence were analysed. Based on this analysis it is necessary to propose an integrated model which integrates/bridges the technology and psychology named RCAPD (Raajan's Computer Aided Psychological Design) model for face recognition and identify the appropriate Mood/motion of the person. The flow diagram represents the architecture of RCAPD model is represented as follows.

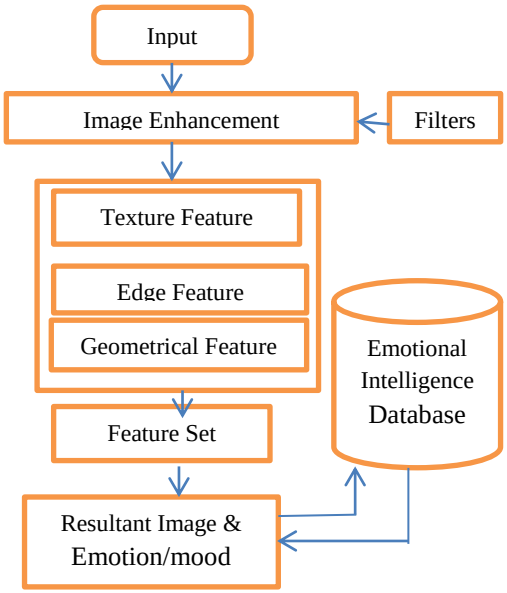
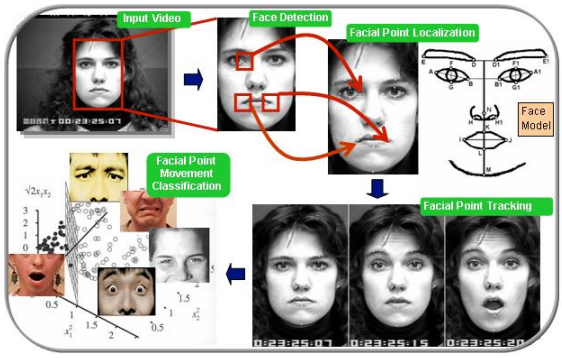


Fig. 1. RCAPD Architecture

From the above figure 1 shows the architecture of Raajan's Computer Aided Psychological Design (RCAPD) Model. In this model the image is selected from the standard image database. Then the selected image gets pre-processed with an efficient filters I,e Median, Gaussian , wiener in the elimination of various noises present in the image.

After the pre-processing the pre-processed image is considered for the extraction of feature such as Texture,Edge,geometrical features. Based on the features is processed with the Emotional database and made an emotional correlation based on the corresponding image feature which is to be proposed. Finally, the output is obtained with the image and the corresponding emotion/mood/behaviour of the personality. The suitable algorithm for the proposed model is represented in the following section.



4. ALGORITHM

Input: Original Image
Output: Psychological Feature

/* RCAPD Algorithm version 1.0

Step 1 : Select an input image Ii from the IDB
Step 2 : Pre-Processed the image
Step 3 : Perform the following feature extraction
  a. Texture
  b. Edge
  c. Geometrical
Step 4 : Establish feature database with feature vectors
Step 5: Process the features with Emotional Data sets
Step 6: Display the image with relevant emotional feature
Step 7: Continue step 1 to step 6 for required image

5. EXPERIMENTATION & RESULTS

The proposed Raajan's Computer Aided Psychological Design model can be experimented with the standard Face image database / Customize database. The image is to be considered of size [256 x 256] and with the Emotional Intelligence Database which consists of the components of Emotional Intelligence of human beings. The input image is to be processed based on the RCAPD algorithm and the output is as follows.

Fig.2 disgust, happiness, sadness, anger, fear, and surprise

6. CONCLUSION

In this paper we, presented an innovative Raajan's Computer Aided psychological Design [RCAPD[model for computing the Emotional Intelligence / Mood of a particular personality based on the face image. In this Method this different areas were considered and integrated. It is processed in different phases. In the first phase the image gets enhanced by various filters and considering the better enhanced filter the image is processed to feature extraction. Then the extracted features are computed with the Emotional Intelligence Database. Finally, the resultant image with its corresponding emotion/mood with be displayed for the personality Identification using face. Based on the analysis this is a new methodology

introducing into the research market and will provide better performance and will make a maximum support in personality identification.

7. FUTURE WORK

The proposed RCAPD model can be enhanced in future by proposing a static filter and also multiple experimentation with various images to be carry out. It is also be extend for medical diagnosis.

REFERENCE

[1] Divyarajsinh N. Parmar1, Brijesh B. Mehta, Face Recognition Methods & Applications, Int.J.Computer Technology & Applications,Vol 4 (1),84-86, ISSN:2229-6093

[2] Sujatha BM, Chetan Tippanna Madiwalar ,Suresh Babu K, Raja K B and Venugopal K, COMPRESSION BASED FACE RECOGNITION USING DWT AND SVM, Signal & Image Processing : An International Journal (SIPIJ) Vol.7, No.3, pp.45-64, DOI : 10.5121/sipij.2016.7304June 2016

[3] Omoyiola, Bayo Olushola, Overview of Biometric and Facial Recognition Techniques, Journal of Computer Engineering (IOSR-JCE), Volume 20, Issue 4, Ver. I (Jul - Aug 2018), PP 01-05, ISSN: 2278-8727

[4] Akshay A. Pawle, Vrushsen P. Pawar, Face Recognition System (FRS) on Cloud Computing for User Authentication, International Journal of Soft Computing and Engineering (IJSCE), Volume-3, Issue-4,198-192, ISSN: 2231-2307, September 2013

[5] Alireza Chevelwalla, Ajay Gurav, Sachin Desai, Prof. Sumitra Sadhukhan, Criminal Face Recognition System International Journal of Engineering Research & Technology (IJERT) Vol. 4 Issue 03, pp.47-51,March-2015,ISSN: 2278-0181

[6]S. T. Gandhe, K. T. Talele, and A.G.Keskar, Face Recognition Using Contour Matching, IAENG International Journal of Computer Science, 35:2, IJCS_35_2_06

[7] Ishwar S. Jadhav, V. T. Gaikwad, Gajanan U. Patil, Human Identification using Face and Voice Recognition, International Journal of Computer Science and Information Technologies, Vol. 2 (3) , 2011, 1248-1252,ISSN:0975-9646.

[8] Ms. Swati S. Bobde1, Mr. Sumit V. Deshmukh, Face Recognition Technology, International Journal of Computer Science and Mobile Computing, Vol.3 Issue.10, October- 2014, pg. 192-202, ISSN 2320–088X

[9] B.S.Khade1, H.M.Gaikwad, A.S.Aher, K.K.Patil, Face Recognition Techniques: A Survey, International Journal of Computer Science and Mobile Computing, Vol.5 Issue.11, November- 2016, pg. 65-72,ISSN 2320–088X

[10] Christine L. Lisetti Diane J. Schiano, Automatic Facial Expression Interpretation: Where Human-Computer, Interaction, Artificial Intelligence and Cognitive Science Intersect, *Pragmatics and Cognition (Special Issue on Facial Information Processing: A Multidisciplinary Perspective)*, Vol. 8(1): 185-235, 2000.

[11] *Nirmala Raghavan1 & S. Panboli*, MEASURING EMOTIONAL NTELLIGENCE OF SCHOOL CHILDREN – A PILOT STUDY, International Journal of Research in Humanities, Arts and Literature (IMPACT: IJRHAL) ISSN (P): 2347-4564; ISSN (E): 2321-8878 Vol. 6, Issue 1, Jan 2018, 207-218

[12] Marc A. Brackett and Peter Salovey, Measuring emotional intelligence with the Mayer-Salovery-Caruso Emotional Intelligence Test (MSCEIT), *Psicothema 2006. Vol. 18, supl., pp. 34-41, ISSN 0214 – 9915*

[13] Priyam Dhani1, Dr. Tanu Shar, EMOTIONAL INTELLIGENCE; HISTORY, MODELS AND MEASURES, International Journal of Science Technology and Management, Vol.No.5,Issue No.07,July 2016,ISSN:2394-1537

[14] Amulya Kumar Behera, Understanding Emotional Intelligence in Educational Context, *International Journal of Humanities and Social Science Invention, Volume 5 Issue 2 ||February. 2016 || PP.17-28, ISSN (Online): 2319 – 7722, ISSN (Print): 2319 – 7714,*

[15] K. V. PETRIDES and ADRIAN FURNHAM, Trait Emotional Intelligence: Behavioural Validation in Two Studies of Emotion Recognition and Reactivity to Mood Induction, European Journal of Personality, Eur. J. Pers. 17: 39–57 (2003), Published online 12 December 2002 in Wiley InterScience (www.interscience.wiley.com). DOI: 10.1002/per.466

[16] Anna Leszczyńska, Facial emotion perception and schizophrenia symptoms, Psychiatr. Pol. 2015; 49(6): 1159–1168, PL ISSN 0033-2674 (PRINT), ISSN 2391-5854 (ONLINE), DOI: http://dx.doi.org/10.12740/PP/38919

[17] Karen J. Kelly and Janet Metcalfe, Metacognition of Emotional Face Recognition, Emotion,American

Psychological Association 2011, Vol. 11, No. 4, 896–906 1528-3542/11/$12.00 DOI: 10.1037/a0023746

[18] Katja Schlegel, Didier Grandjean, and Klaus R. Scherer, Introducing the Geneva Emotion Recognition Test: An Example of Rasch-Based Test Development, Psychological Assessment © 2013 American Psychological Association 2014, Vol. 26, No. 2, 666–672 1040-3590/14/$12.00 DOI: 10.1037/a0035246

[19] Christine L. Lisetti Diane J. Schiano, Automatic Facial Expression Interpretation: Where Human-Computer Interaction, Artificial Intelligence and Cognitive Science In tersect, *Pragmatics and Cognition (Special Issue on Facial Information Processing: A Multidisciplinary Perspective)*, Vol. 8(1): 185-235, 2000.