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## Online interview based on facial expression

Kamal Raj T.

[rrcekamal@ce@gmail.com](mailto:rrcekamal@ce@gmail.com)

Rajarajeswari College of Engineering,  
Bengaluru, Karnataka

Sourav P Kachwahe

[souravpkachwahe@yahoo.com](mailto:souravpkachwahe@yahoo.com)

Rajarajeswari College of Engineering,  
Bengaluru, Karnataka

Tejas S.

[tejasagasthya1999@gmail.com](mailto:tejasagasthya1999@gmail.com)

Rajarajeswari College of Engineering,  
Bengaluru, Karnataka

Shashank C.

[shashankgowda8055@gmail.com](mailto:shashankgowda8055@gmail.com)

Rajarajeswari College of Engineering, Bengaluru, Karnataka

Sanjay H. S.

[sanjayhsravani@gmail.com](mailto:sanjayhsravani@gmail.com)

Rajarajeswari College of Engineering, Bengaluru, Karnataka

### ABSTRACT

Facial expressions of humans carry more information visually than they do verbally. Human machine interaction is a crucial part of facial expression recognition. The automated facial expression recognition system can be used for many purposes, including detection of intellectual issues and human behavior information. It is still difficult to recognize facial expressions using computers with high recognition charges. The most well-known techniques used in automatic FER systems are based on look and geometry. Normally, facial expression recognition works in four stages, which include preprocessing, face identification, Feature extraction and Classification. We also used feature extraction and expression classification to identify the seven key human emotions.

**Keywords:** Haar Cascade, Face Detection, Recognition, Nice Face, Terrible Face.

### 1. INTRODUCTION

Our desires have become more possible with modern technology. The field of digital image processing is undergoing a lot of research. This has led to an exponential growth in the field of image processing and digital images. The expressions on our faces reveal how we feel. Interpersonal verbal communication is a lot easier when you use facial expressions. A facial expression is a non-verbal scientific gesture that's expressed in the face to express our emotions. Artificial intelligence and robotics are dependent on facial recognition. This has several benefits, including non-public identification, get access to control, videophone, teleconferencing and forensic application. It also allows for human-computer interaction, cosmetology, and computerized surveillance. Human emotion detection can be used in many places. This may require additional security information or information about the individual. This is a step beyond face detection. In some cases, we might need to add a layer of security. The second layer will detect the emotion and the face.



Figure 1: Seven Different expressions

A system has been developed that can detect stress levels and provide feedback to help reduce stress. Modern people are often under extreme stress. We proposed a system that the Panel be updated with an emotion recognition system for the candidate. This makes it possible for panel monitoring to be done about the understanding of the online test for candidates. The body must have the biosignal measuring device. So Many studies have been performed on stress detection using thermal images. However, this has the disadvantage that it can be difficult to recognize stress in everyday life without thermal imaging equipment. However, the majority of studies on stress recognition using a general photo have used a simple feature. We propose a method to recognize stress using high-dimensional features extracted from images of faces taken with a general camera. There have been many projects in this area. Our intention is to not only expand the Automatic Facial Expression Recognition System, but also to improve the accuracy of the system relative to other systems.

### 2. PROPOSED METHODOLOGY

Facial feature extraction is difficult, even though the photos were taken in controlled settings. Masses of artwork are created to deal with expression model photos or function extraction approaches in part-occluded situations. Figure 2 shows the architecture of our proposed system.

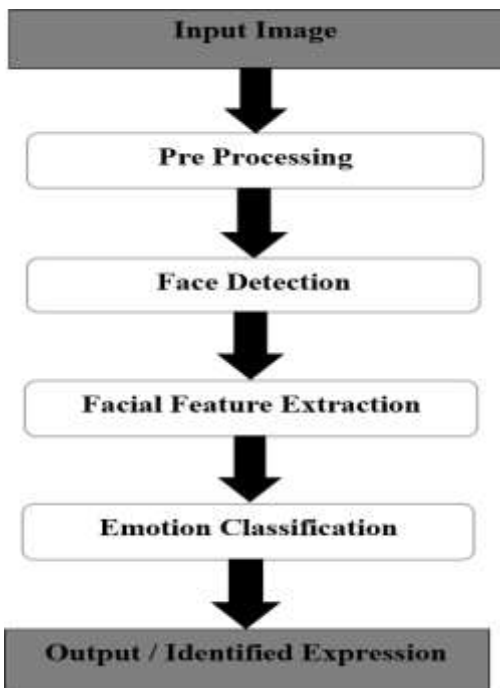


Figure 2: Problem Formulation of Our Project

**Image Acquisition:** The camera can capture images of faces. Image sequences and static images are used to recognize facial expressions. Without an image, processing cannot be done. It is the result of something that was done to it. This method has one final goal. It is designed to provide input that works within such measured and managed suggestions that identical images can be reproduced almost flawlessly under the same conditions.

**Pre processing:** Preprocessing refers to operations that involve images at the lowest stage of abstraction. Pre-processing is a way to improve image statistics and reduce undesirable distortions. It also enhances some photo capabilities that are vital for picture processing.

- Gray Scale Conversion
- Filtering
- Binarization

**a. Grayscale Conversion:** Grayscale image only contains the simplest information about brightness. Grayscale images have a simple brightness information. Each pixel price corresponds to a certain amount of light. Grayscale images can differentiate between brightness levels. Grayscale photo can measure the lightest depth 8 bit photo. The brightness variation could be from 0 to 255, where 'zero' represents black and '255' represents white. Grayscale conversion color images are converted into grayscale Images as shown in fig 3. Grayscale snap shots are cleaner and more efficient than colored photos. Grayscale photos are the basis for all photo processing. Our proposed device converts x-ray photos into grayscale images.



Figure 3: Image Pre processing

**b. Filtering:** Noise elimination is the goal of removing undesirable noise from digital photos. It is difficult to determine which capabilities are actually present in a picture and which may be caused by noise. Noise can be described as random variations in pixel values. To remove unwanted noise, we use median clear out in our system. Median clearout is a nonlinear filter out that leaves no edges unaligned. Each sample price is examined through its magnitude. The median value of the pattern within the window is the filter out output.

**c. Image Enhancement:** Image enhancement has the primary purpose of enhancing images in order to enhance the visibility of features of interest. To achieve a better quality result, contrast enhancement is used.

**Face Registration:** Face registration uses laptop technology to identify faces in digital photos. Face registration is the process of placing faces in photos using a set or landmark points (also known as "face localization") Face registration is a process that normalizes geometrically the faces that have been detected to match some templates photos.



Figure 4: Face registration

**Facial Feture Extraction:** The most important part of a sample type problem is choosing the characteristic vector. After pre-processing, the photo of face is used to extract the most important features. These include the size, pose and translation as well as variations in illumination levels. The function extraction is crucial in extracting the records in a given image. This is the use of glcm to evaluate texture photos. Glcm can be used to determine spatial dependence between pixels in a photograph. Glcm uses grey degree image matrix to capture spatial dependency between photograph pixels. The registered image is used to generate a numerical feature vector. The following are some common functions that can be extracted are:

- Lips
- Eyes
- Eyebrows
- Nostril tip

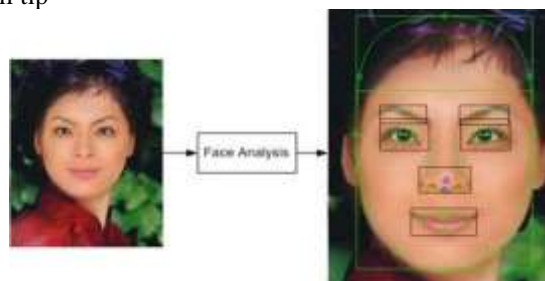


Figure 5: Feature Extraction

**Emotion Classification:** Data obtained by the characteristic extraction method can be too dimensional so category is used to reduce it. The convolutional neural community algorithm will allow you to extract exceptional value for items of distinct elegance. Convolution neural network is a binary classifier that makes use of hyper-aircraft. One of these issues is sample recognition such as texture category employing cnn. The

mapping of non-linear input data to linear statistics allows for true classification in high dimensional areas in cnn. Cnn maximizes the marginal distance between distinct lessons. Different kernels are used for dividing the classes. Svm, a largely binary classifier, determines hyper-aircraft in dividing classesses. The hyper aircraft and the two instructions define the boundary. Help vectors are the samples closest to the margin that could be used in determining the hyper plane. The algorithm attempts to classify the faces that represent one of the seven fundamental emotions within the 1/3 step of class. Paul ekman is an american psychologist. He is a college of california professor emeritus in san francisco. He was an innovator in the study and analysis of emotions and facial expressions. His "atlas" for emotions includes more then 10000 facial expressions.

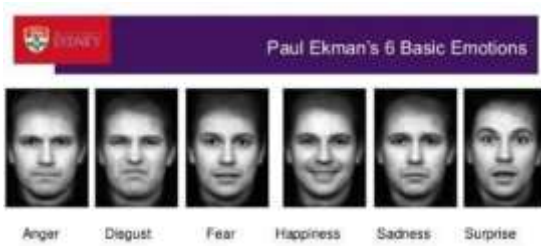


Figure 6: Emotion Classification

### 3. TRAINING AND TESTING DATABASE

It is crucial to gadget learning that algorithms are developed and studied that can learn and make predictions from data. These algorithms are built using statistics-driven predictions and selections. They often use more than one dataset to create the final model. Three facts sets are typically used in exceptional tiers of the creation of the model. could be a collection that can be used for maintaining the parameters (e.G. This version shows the weights of connections between neurons within artificial neuron networks. The model (e.G. The model (e.G. The model (e.G. Gradient descent or stochastic gradient descent). Education datasets are often made up of pairs of input vectors and corresponding answer vectors, also known as scalars. This is often called the target. This cutting-edge version can be used with the schooling data and generates a result that can then be compared to the target for each enter vector in the schooling data. The parameters of the model can be adjusted based entirely on the results of the contrast and the particular getting to know algorithm. Each variable selection can be included in the model. The outfitted version can then be used to predict responses from observations taken from a validation dataset. The validation dataset allows for an objective assessment of the version used in the training dataset and also allows for tuning hyperparameters You can use validation datasets to regulate by using early prevention. Stop education while the validation dataset error grows. This is an indicator of overfitting to the education dataset. It is possible to complicate this simple process by considering that validation dataset errors may differ. These difficulties have led to many guidelines being developed for deciding, while overfitting is undoubtedly a problem. The check dataset was created to allow independent evaluation of finals. Version fit on education dataset. various facial datasets available on line are:

- Japanese Female Facial Expression (JAFFE)
- FER
- CMU MultiPIE
- Lifespan
- MMI
- FEED
- CK

### 4. MODULES AND ANALYSIS

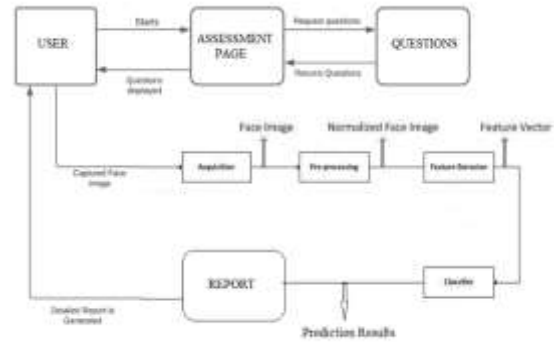


Figure 7: Data Flow Diagram

A facts-go with the flow diagram (dfd), is a graphic representation of the "waft", or facts, through a statistics system that models its aspects method. It does not go into great detail and can later be expanded. Dfds can also be used to visualize information processing (based layout). It indicates how statistics will be input and output by the system, what information will be stored, and where records will be kept. This diagram does not provide information about the procedure timing, nor whether processes will be performed in sequence or in parallel. A conventional based flowchart, which shows a particularity of control and flows, or an uml hobby workflow diagram which provides both records and manage flows, is also called a data flow diagram.It is complete when the mission, idea, pattern, design and specification of the software are completed. It could refer to a program, software program detail, or other laptop gadget programming, and the transport of a technical specification. Figure 7 shows how many implementations there are of face occlusion according to a particular specification.

Module 1: Data collecting

Figure 8 describes how facial popularity records series can be used to study and compare facial details. Face detection is a whole approach. It locates further to detect human faces in images and films.



Figure 8: Data Gathering

Module 2: training data

It will also educate any pix that may be detecte, So that you can be stored on an trainer/list which takes all photos on listing dataset input and it'll educate all of them.

Module 3: Face Recognition

Figure 9 shows how we can capture glowing faces on our virtual camera. If the man or woman has had their face photographed professionally before, our recognizer will return a "prediction" and provide an index. This validates how confident the recognizer with this match is.



Figure 9: Face recognition

Module 4: Face detection

The easiest mission on Face Recognition is of course, “Face Detecting”. Before anything, you must “capture” a face a great manner to recognize it, even as in contrast with a cutting-edge face captured on future. The most now no longer unusual place way to hit upon a face is using the Haar Cascade .Here we're capable of artwork with face detection. Initially, the set of guidelines needs hundreds of first rate pix (pix of faces) and horrific pix (pix without faces) to educate the classifier and results shown in figure 10.



Figure 10: Face Detection.

Module 5: Face classification

All Face recognizers are capable of de-serializing and serializing their inner kingdoms to disk. All recognizers are capable of incremental learning. There are many default implementations, but the most common place is the Face Recognition which can use any form of Incremental to perform the actual classification. Figure 11 shows the unique recognisers that can be used with inner recognizers to aid in Faces algorithm construction.

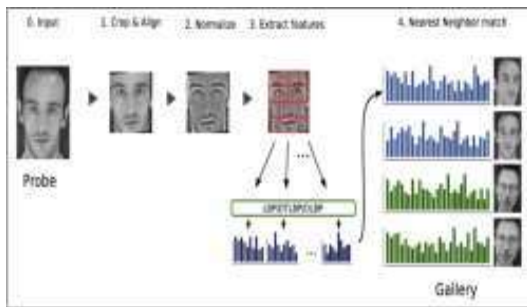


Figure 11: Data Classification

5. RESULT AND DISCUSSION



Figure 12: Dataset Trained Successfully

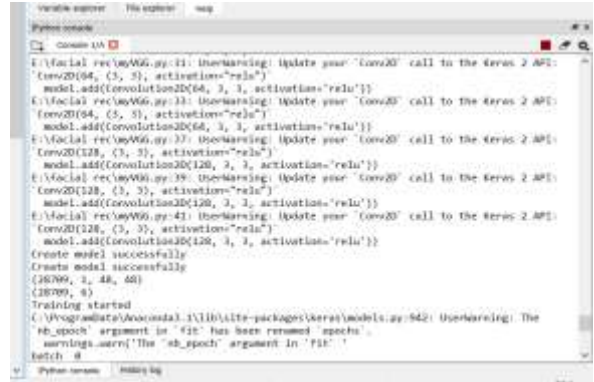


Figure 13: JSON model Created Successfully



Figure 14: Accuracy Check of The Model



Figure 15: Login Page



Figure 16: Registration Page



Figure 17: Assessment Start Page

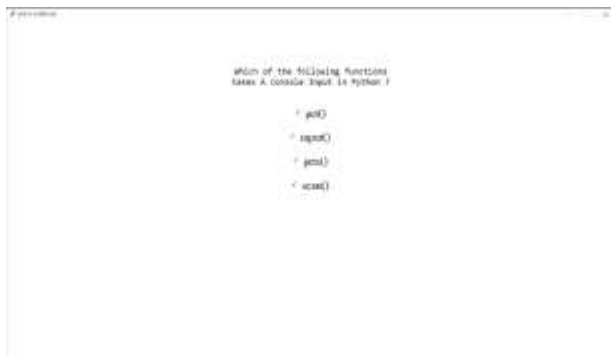


Figure 17: Assessment Page



FIGURE 18: Output 1



FIGURE 19: Output 2

## 6. PERFORMANCE EVALUATION

The computer, which is primarily based on occlusion discipline, has advanced rapidly in the last twenty years. Numerous algorithms were developed and advanced to the point where computer systems can match human beings in face accuracy. Occlusion. However, the final analysis algorithm has seen fundamental improvements over the past several years. The proposed work is about facial characteristic extraction and classification. This is despite the fact that snap shots are taken in neatly controlled settings. This task becomes more complicated when the appearance of the face is altered by expression or partial obstruction. The scenario also includes a lot of artwork that focuses on extraction techniques for expression or partially occluded model snaps.

## 7. CONCLUSION

We support a set of character recognition rules that uses face photos and landmarks. This algorithm is used to detect facial characteristics and extract facial characteristic. The experiment revealed that facial landmarks were able to improve personality popularity overall. Because facial landmarks can be used to help understand facial behaviour, eye, mouth and head movements, they are more effective at perceiving strain. The use of a gray face image with the appropriate size helped us to improve our overall performance. This allows applicants who cannot wait to be interviewed at the agency. It saves electricity and time for the interviewer, according to our findings. It is primarily based on

the mapping of biological biometric traits and behavioral traits. Geometrical systems that are used as a base match template for the popularity device can be used to identify the physiological characteristics of the human face. These include happiness, fear, anger and surprise. This machine's behavioral factor relates to the mind-set behind exclusive expressions. As exposed and hidden classes in genetic algorithmic gene genes, the assets bases are effected. The gene schooling set assesses the expressional uniqueness of individual faces and provides a resilient expressional recognition model within the subject of biometric security.

A unique, unidirectional cryptosystem is primarily built on biometrics that have capabilities such as hierarchical group security. This unique hardware device is required. This research will open up new avenues of study in the field of uneven biometric cryptosystems. It's extremely appropriate for the purpose of completely removing passwords and clever cards. The hierarchical safety system is powerful in geometric identity for physiological traits, according to an experimental analysis.

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