# Emotion Basic action using Face Recognition and Detection ANN

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## ABSTRACT

Face detection and recognition are the popular research area in the field of security vision and authentication because it is the first step in many applications like intelligence weapon with sensors and surveillance. Face detection and recognition algorithms are computationally intensive, which is challenging to prove face detection applications in real-time. Moreover, authentication of many security areas is a significant issue in the world of control, electronic, and communication. Face recognition is a secessionist of biometric verification and has been widely used at door control systems, video conference monitoring, weapons control systems, and network security, and so on. Face detection is used as a part of a facial recognition system by the author. Its technologies consist of the human-computer interface, face database management system, video surveillance, and human behavior monitoring system. This paper is achieving face detection and recognition that will integrate with robot mouth emotional technology using database systems. The system will have a database of registered peoples. If the face matches the database, then it displays the friends, enemies, awesome things, annoys, and the robot mouth will be an emotion system. These six motors' emotion systems stilled testing by using outputs of computer programs or microcontroller systems.

**Key words:** ANN, face recognition, emotion

## 1.INTRODUCTION

This paper mostly emphasizes the behavior of humanistic resemblance that is anatomy knowledge because this paper intends to robot eye and mouth systems that are known to the nature of human eyes, mind, and mouth. This paper implemented the identified face-detection, face recognition, database systems, and emotional styles of mouth. And also the human eye, mind, and mouth actions.

Robotic behaviors have never been the same as a human being because our human brain was very complicated and convoluted. Indeed, if we need to progress the robotic behavior system, we must learn neuron network technology and human behavior and animal behaviors (nearly cat and dog). For example, cats and dogs, not the same behavior because cats like to think human-like servants and dogs like to think human-like master. Furthermore, their tail, head, body behaviors are not the same.

Organisms of humans are complicated to learn deeply. Therefore, Humans and robotic are never the same behaviors and thoughts. For example, the human eyes are separated into five parts seeing things that have light sources. (1) Need to have eyes to see other human being and things and so on. (2) Capture and store image into the database (3) Analytical capture and store image that is known knowledge (4) Appreciation for this image (friend or enemy) (lover and hater) (5) Action to do (like smile for a friend and annoying for the enemy).

If the face detection and recognition that is like robot eyes want to make, we should notice that idem five facts. No. (1)like that the camera, No (2) like that database, No.(3) like analytical software, No (4) like the result of analytical software and No (5) like motor actions.

Robotic things can only consider three ways, (1) Through introspection (2) through Psychological experiments and (3) through brain image.

(1)    Through introspections are controlled the original position and where they are arriving location. They can act to return the unique situation.
(2)    Through Psychological, experiments are an essential part of the robotic. They can use the only solution as a software programmer. An intelligent programmer can make perfect, mostly like to think humans because human Psychological changed our mind a hundred million/sec one psychological. So the right thing a predicate right through mental.
(3)    Through the brain, the image is complicated to know as informal. Therefore, we need to learn the structures of the brain profoundly and then how to work the brain. Moreover, neural network technology should learn thoroughly and deeply, and then we would like to improve our robot behavior as human or animal behavior detail.

## 2.REAL-TIME FACE DETECTION

There are two types of face detection problem: they are (a) Face detection in the image and (b) real-time face detection.

Face detection systems distinguish the part of the whole face, where is discarded of the backgrounds and another area of the head such as locks that are not necessary for face recognition. However, face detection and recognitions are be used to part of the eye, nose, and mouth in the face.

Real-time face detection and recognition can detect a facial from the video capturing devices that are laptop, webcam, and CCTV. While the system of hardware requirements are critical, form a computer vision standpoint, real-time detection is a not near actual face process than a static image of the face because people are stable. Indeed, they have changed to the form of facial and our environment are breaking every time.

Real-time face detection presented with a series of frames in which to detect a face and moving faces, by using Spatio-temporal filtering, the area of the frames that have changed the identified, and the individual detected.[6]

Furthermore, a seen in figure exact face location can quickly determine by using a few simple rules such as,

1) The head that is the central part of human organisms is parts of the whole body.

2) Movement of the head must be mulling slow, and contiguous heads will never stable around erratically.

The face detection and real-time face detection is very similar to human eyes. Camera and human eyes look like the function of the Image focusing and the Light adjustment.

Moreover, Iris was connected to the brain by nerve-cell blood capillaries. Our eyes are not only working themselves. They were a merely physical condition because we can not observe too each other such as our eyes and our nerve system are not correctly working at the same time. Sometimes, we are thinking about for someone, our business, our plan. At these times, we are not seeing another thing or persons that are overthinking.

This paper intends to get the knowledge that face recognition and real-time face detection compared with human behavior, which is the eyes, brain, and actions of mouth (emotional of our minds). Figure.1 shows the Face detection by using Matlab. Figure.2 shows Real-time face detection by using Matlab.



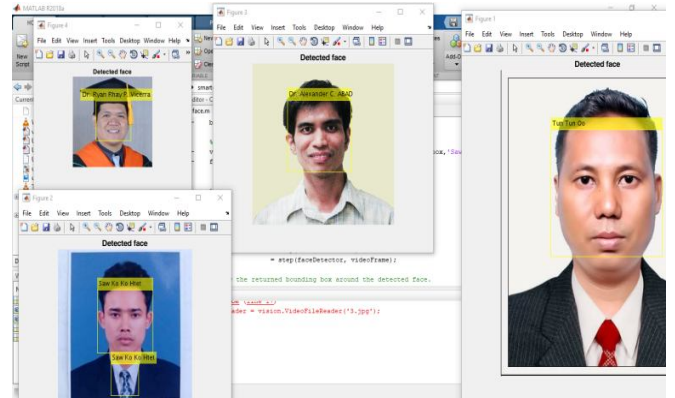**Figure1:** Real-time faces detection by using Matlab



**Figure 2:** Face detection by using Matlab

Figure 3 shows the Greyscale of face detection by using Matlab. The face detection process is identifying different parts of human faces like eyes, nose, mouth, etc. All of the processing of this paper could achieve by using MATLAB. In this paper, the author will exert to do useful to study the greyscale intensity distribution of the human face, such as eyes, mouth, nose, etc.



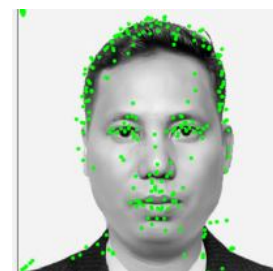**Figure 3:** Greyscale of face detection by using Matlab



**Figure 4:** the pixel face detection by using Matlab

Figure.4 showed the pixel face detection by using Matlab. If face detection is needed to more definitely, the pixel matching is more be effective than other matching systems. There are many detection systems for faces. Some of these are mouth detection, Noise detection, Nose detection, and Eye detection.

## 3.FACE RECOGNITION USING TEMPLATE MATCHING

Registration Estimator app from files that they can also provide optional spatial referencing information of data and a voluntary initial geometric transformation of template matching systems. This system has required that we are loading images from the files or workspace in MATLAB software, providing distance between the information of the data and providing a starting point of the geometrical transformation of the corresponding systems. Figure.5 shows transformation to segmented text from the original.

The Registration estimator is a great geometrical transformation for face detection, which needs to greyscale. It can store registration in the form of the alphanumeric character, word, individual character, and using various types. This transformation is the most detail for another transformation step from face detection. Moreover, our faces seem to build a form of words, characters, special characters, and various shapes styles. Figure.6 shows Store form to Data Browser as samples. And, Figure.7 shows Store form to Data Browser of face detection.



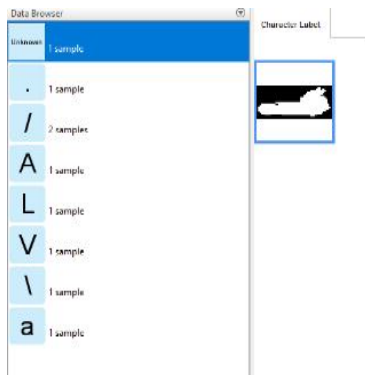**Figure 5:** Transformation to segmented text from the original



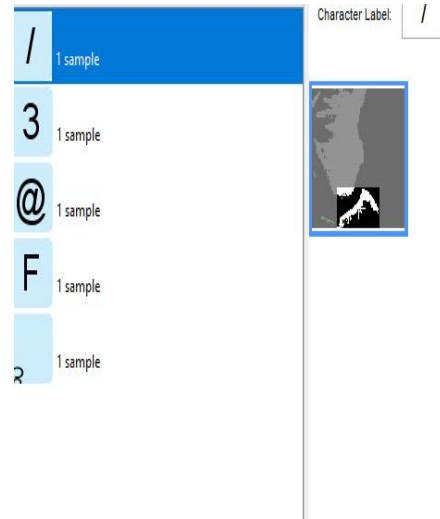**Figure 6:** Store form to Data Browser as samples



**Figure 7:** Store form to Data Browser of face detection

The Face recognition and detection that implemented fully automated could use to watch the unethical activity of humans, such as ATM user security, that it is using like mugshot matching. Mug shot matching is the photographs of a person's face made for an official purpose, especially police records. In the information and digital world, the people who they have crime case are straightforward to find their face and image in the face detection and recognition systems. Figure.8 shows Neural Network Training input/output. And, Figure.9 shows Neural Network performance.

When mugshots application has gathered the person who has a criminal case, the frontal view of face recognition should display the recognition accuracy better than the output of the face detection and recognition system and then report the police station concurrently. Moreover, the location of the GPS is the main part of this system because the police can know and notice the area of a person who has a criminal case. Figure.10 shows the Pixel outputs error histogram. And, Figure.11 shows the accuracy of Eigenfaces
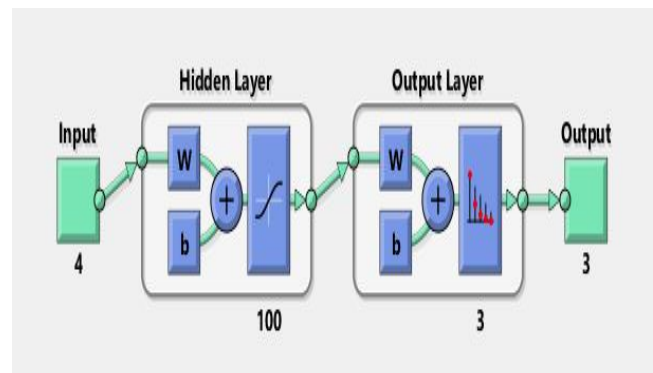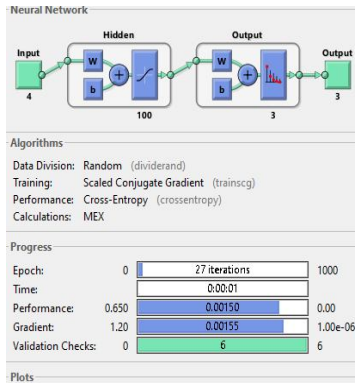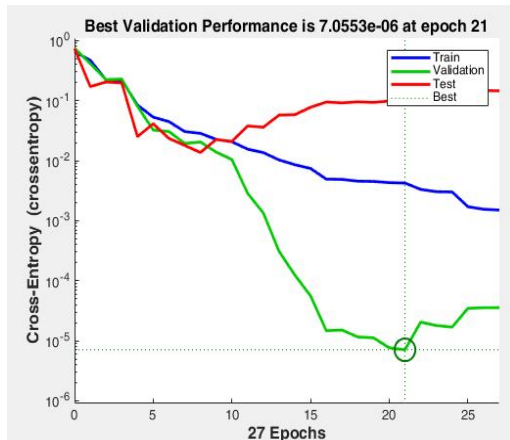
**Figure 8:** Neural Network Training input/output
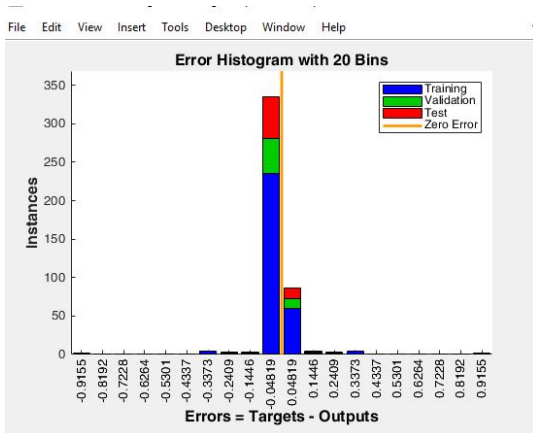


**Figure 9:** Neural Network performance



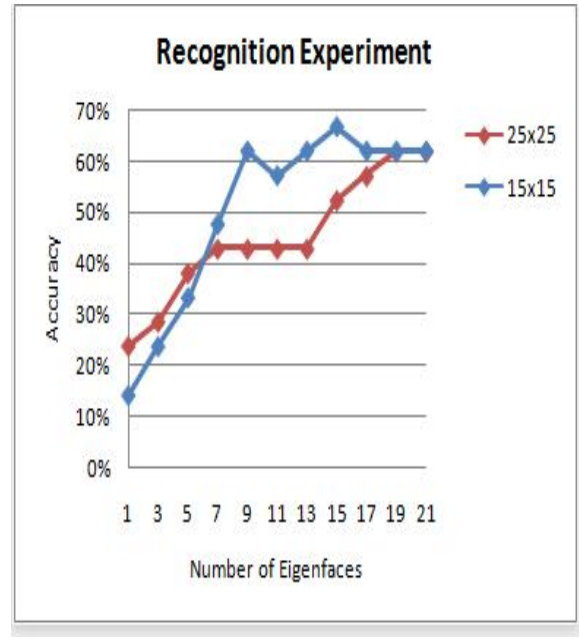**Figure 10:** Pixel outputs error histogram



**Figure 11:** the accuracy of Eigenfaces

## 4.FACE AND NON-FACE DETECTION

A direct LDA algorithm is useful for high-dimensional data in the place of face recognition applications. LDA (linear discriminant analysis), Direct LDA, are better than class scatters matrix at the ultimate situation. Sw is singular; it does not throw away the null space of Sw and PCA+LDA, which does PCA on the data and then does LDA on the dimensionally reduced data. There is also an implementation of PCA (principal component analysis) by using Eigen decomposition and another using SVD. [26] This paper is be emphasized the changes of emotional mouth servomotor systems. Therefore, the face and non-face detection could not be show detail.

## 5. DATABASE SYSTEM FOR FACE EMOTION DETECTION

The purposes of benchmarking the face recognition system create a database of the facial image. Ultimately, the facial image can classify into two subsets that are separate training and testing systems. At the time of menu training, 30 images used the design that consists of six subjects, and each issue that has five images with different facial expression and emotion.

There are two training systems in the database applications that are the training of image database and testing of new images. Figure.14 shows the Face database system.
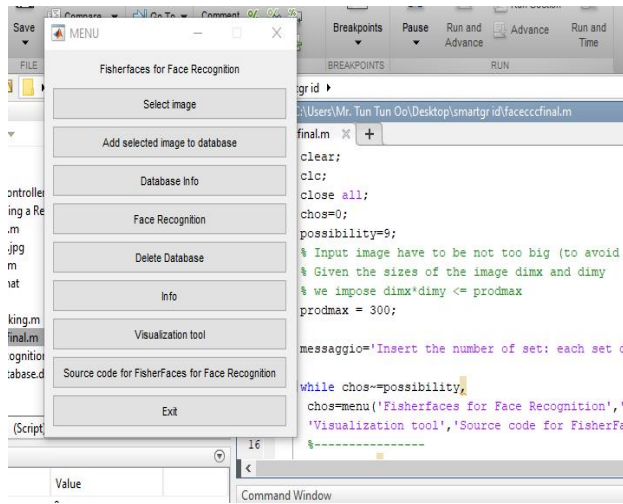
**Figure 14:** the Face database system

The database file system would store to files as a friend (Happy), an enemy (Anger), sad record, disgusted, fearful, fearful angry, fearfully surprised, and fearfully disgusted. These zones file can get from face detection and recognition systems. Moreover, this cascade files interfaces to go through the four motion motor movements by making the motion of the robot mouth emotions style.

## 6.MOTOR MOTION FOR MOUTH EMOTION

The types of DC motor applications where rotation of the motor w used servo motor that need to a certain angle not continuously for long times. Servo motors can rotate, which it is required a specific angle for a given input of the PWM signal.

There is three input of application servomotor that is the black color pin that uses the ground, red color pin that is a positive voltage (5v or corresponding motor) and orange that feed on signal generator (PWM). For this purpose, six servo motors come from database matching file systems that are typically a simple six DC servomotors that they controlled for the specific angular rotation that a typical closed-loop feedback control system. Nowadays, the servo system has large industrial applications. Six servos motors depend on the output of the database from the computer.
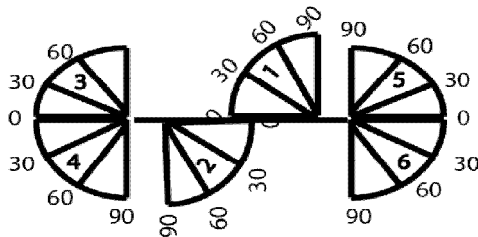


**Figure 15:** Six servomotors angular in the robot mouth

Figure 15 showed the direction of Six servomotors angular in the robot mouth. The angular motor degree in the root mouth is an essential effort of motion of mouth. If the camera image detected in one friend-list zone image, the output of the computer produces eight signal serials bypassing USB port. These signal choices the six motor positions as a smile. One smile, anger, sad, disgusted, fearful, fearful, angry, fearful surprise, fearful disgusted are always work four servomotors. If the smile signal arrives in the database system, the motor no.(1) is stilled zero position, and No (2) is 30 degrees, no(3) is 60 degrees, and no(5) is 60-degree positions.

This paper uses the 16 bits flow output of the computer. Bits (1 to 6) are the on/off system of the motors. Bit 7 and bits 8 are work upper lip and lower lip direction. Either upper lip or lower lip should work 30-degree servo motor position. Bits (9 and 10) are selected degree for motor no. 3. In the same manner, bits (11 and 12), bits (13 and 14), and bits (15 and 16) have been. Conversely, the angry emotion that found the enemy files are pointed to motor no (1, 2, 4, and 6). Servomotor no (1) is the 30-degree and motor no (2) is stop, and then motor 4 and 6 are 60-degree position. Table.1 shows the Smile Detection Bits Sequence. Table.2 shows Angary Detection Bits Sequence.

**Table.1**: show the Smile Detection Bits Sequence

| Motor no. | 1 | 2 | 3 | 4 | 5 | 6 | 1 | 2 | 3 | | 4 | | 5 | | 6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| bits | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| Start | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Motor | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Stop | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Table.2:** Angary Detection Bits Sequence

| Motor no. | 1 | 2 | 3 | 4 | 5 | 6 | 1 | 2 | 3 | | 4 | | 5 | | 6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| bits | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| Start | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Motor | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| Stop | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Table .3:** Bits no (7) and (8) Position

| Bits | 7 | 8 |
|---|---|---|
| Off | 0 | 0 |
| On 30 degree | 1 | 1 |

**Table.4:** Bits No (9) and (10) Angular Position Truth Table

| Bits | 9 | 10 |
|---|---|---|
| $0^0$ | 0 | 0 |
| $30^0$ | 0 | 1 |
| $60^0$ | 1 | 0 |
| $90^0$ | 1 | 1 |

Table .3 showed the Bits no (7) and (8) Position. And, Table .4 showed the Bits No (9) and (10) Angular Position Truth Table. Moreover, bit no (11 and 12), (13 and 14), and (15 and 16) are the same truth table of table IV. The emotional motor systems are a new contribution from the author. If the original contributions continuances, it could become the best research with advanced technologies.

### Acknowledgment

## 7. CONCLUSION

This paper is emphasizing for face detection, databases, and an emotional mouth system like a human being. After using our vision of an image, our brain distinguished to the various types of faces images that are the familiar, lover, enemies, another sentiment. The face detection and recognition is used many places corresponding to the security issue such as multimedia management, security issue, smart cards, phone face ID, and surveillance. This paper has a problem for twin persons in face detection recognition

Almost twin person is the same facial and mind concept. Therefore, the primary focus of twin person could not distinguish unspecified face recognition algorithms that have experienced in various parameters. [14]

Performance of twin persons of emotion can deliberate concerning six conditions: (i) illumination, (ii) expression, (iii) gender, (iv) Aged, (v) blinking of the eyes, and (vi) head movement. Moreover, Iris of eyes, detection pixel upon the face, and biometrics should also use the most effective systems for twin persons.

This paper can be similar to elaborative research that is sound recognition, databases, and emotion robot mouth. Because humans can easily segregate and recognize the notation of sound from an acoustically sound mixture and recognize a specific voice from a noisy environment and surrounding that includes other people talking, laughing, cry and loudly talking and music. In this issue, sound detection and recognition may find to solve the ways to recognize and locate sound events in recordings with a high degree of overlapping functions.

In conclusion, face detection and sound detection are very attracting and challenging the world of security technology day by day.

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