# Smart Rationing By Using Face and Finger Print Recognition System

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## ABSTRACT

This paper is about the face and finger print recognition in ration shop. Ration cards plays an important role for the household details such as to get gas connection, family member details. There are many biometric process in that face recognition is the best method. In this paper we are going to describe the ration shop monitoring system without human interface and it processed by Raspberry Pi .This system also reduces the corruption in the current ration distribution system .This system will be verified with family member for authentication of user and validated the purchase by employee. The consumer gets a text message mentioning the purchase details by using IOT.

Key Words: Internet Of Things (IOT), Image processing

## I. INTRODUCTION

Biometrics is an evolving technology used for identification. Biometrics is associated with automatic identification of a human being depending upon biological factors as in fingerprint, facial recognition. The main objective of this work, to implement the biometric system in ration shop with face recognition to avoid issues or corruption. The advantages of this system are an efficient method for the consumer to buy the products in the ration shop and after the purchase is validated by the employee the consumer gets a text message mentioning the purchase details. The system will works in two different parts. The first part is for capturing and creating a database by storing the image. And the second one is to compare the image with the stored images in the database. Every professional organization has to maintain a proper record for effective functioning of the organization. The result of the data collected through this system will be stored on web server.

## II. RELATED WORK:

A literature is done to know the existing technique their significance and limitations. It is also includes various proposed techniques and their advantage.
1.Fisher face is one the most successfully widely used method for face recognition. It is based on appearance method. In 1930 R.A Fisher developed linear/fisher discriminant analysis for face recognition. It shows successful result in the face recognition process. LDA

method demonstrated in (Belhumeur et al., 1997; Zhao et al., 1999; Chen et al., 2000; Yu and Yang, 2001; Liu and Wechsler., 2002; Lu et al., 2003a, b; Ye and Li., 2004). All used LDA to find set of basis images which maximizes the ratio of between-class scatter to within-class scatter. The disadvantage of LDA is that within the class the scatter matrix is always single, since the number of pixels in images is larger than the number of images so it can increase detection of error rate if there is a variation in pose and lighting condition within same images. So to overcome this problem many algorithms has been proposed. Because the fisher faces technique uses the advantage of within-class information so it minimizes the variation within class, so the problem with variations in the same images such as lighting variations can be overcome.[2] The fisher face method for face recognition described by Belhumeur et al [14] uses both principal component analysis and linear discriminant analysis which produce a subspace projection matrix, similar as used in the eigen face method. However, the fisher face method is able to take advantage of within-class information, minimising variation within each class, yet still maximising class separation. Like the eigen face construction process, the first step of the fisher face technique is take each (NxM) image array and reshape into a ((N*M)x1) vector. Fisher face is similar to Eigen face but with enhancement of better classification of different classes image. With FLD, one can classify the training set to deal with different people and different facial expression. We have better accuracy in facial expression than Eigen face approach. Besides, Fisher face removes the first three principal components which are responsible for light intensity changes; it is more invariant to light intensity. [4] The disadvantages of Fisher face are that it is more complex than Eigen face to finding the projection of face space. Calculation of ratio of between-class scatter to within-class scatter requires a lot of processing time. Besides, due to the need of better classification, the dimension of projection in face space is not as compact as Eigen face, results in larger storage of the face and more processing time in recognition.

2. The neural networks are used in many applications like pattern recognition problems, character recognition, object recognition, and autonomous robot driving. The main objective of the neural network in the face recognition is the feasibility of training a system to capture the complex class of face patterns. To get the best performance by the neural network, it has to be extensively tuned number of layers, number of nodes, learning rates, etc. The neural networks are non-linear in the network so it is widely used technique for face recognition. So, the feature extraction step may be more efficient than the Principal Component Analysis. The authors achieved 96.2% accuracy in the face recognition process when 400 images of 40 individuals. The classification time is less than 0.5 second, but the training time is as long as 4 hours features in a hierarchical set of layers and provides partial invariance to translation, rotation, scale, and deformation. The disadvantage of the neural network approach is that when the number of classes increases.

## III. EXISTING SYSTEM:

The heart of the system is the microcontroller PIC16F877A. The biometric or finger print identification is the first step of the system. The finger print of each user will be stored in a database. After identifying the finger print, the name of the person and ration will be displayed via LCD display. The user can now enter the amount of ration he wants through a five keypad. The valves of the system open to provide the commodities. The details of the purchase will be sent over a GSM to the user's mobile and authorities. The proposed system implements a centralized web enabled ration distribution and corruption controlling system. The goods are stored in a storage tank and when goods are inserted in ration shop, the quantity log is updated. The quantity log

can be accessed by the user whenever he needs to collect ration from the ration shop. This method prevents increased corruption in private as well as public sector. The adulteration in consumables can be prevented to a great extent with this system. This system is very cost effective and time saving approach.



## IV. REQUIRED COMPONENT:

- Finger print scanner
- Web camera
- GSM
- Product select switch
- Power supply
- Load cell
- Micro controller
- Relay Driver
- Load display
- Pump motor

## V. PROPOSED SYSTEM:

The camera which connected to the raspberry pi will check the face pattern of the person and sent the data to the micro controller. And the Fingerprint sensor also check the bio metric detail of the customer. After the authentication process the product selection will be done by the customer and the load cell will measures the rate of oil and other food raw materials. Then the material which are given to the consumer will be noted by the ration store's database. Then SMS is sent to the customer about the ration shop purchase details with using GSM.
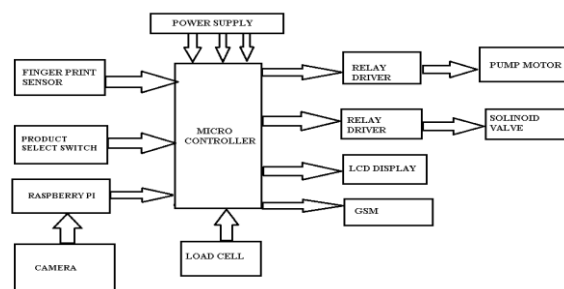


## VI. WORKING:

**In first stage-**Finger print operation should be perform.

The finger print of users will be scanned and stored in a database. If a user places his finger in the finger print module, it checks the matching with the ones stored in database. If the finger print matches the information about the user will be displayed in LCD. Using five key pad the amount of products required is fed on to the system. Once the input is fed the valves open to provide the corresponding products. Two separate valves are provided, one for solid and other for liquid.

**In second stage-**Finger print operation is failed then only face recognition can take place.

Face recognition systems use computer algorithms to pick out specific, distinctive details about a person's face. These details, such as distance between the eyes or shape of the chin, are then converted into a mathematical representation and compared to data on other faces collected in a face recognition database.
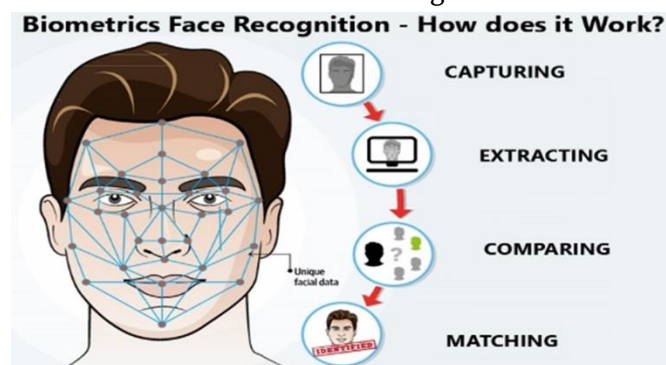
After successful face recognition, the result are display into LCD display.

## VII. CONCLUSION

Our proposed framework makes the ration distribution system automated & secured. Since the biometric unit is implemented, high degree of authenticity is achieved. The automatic ration distribution system depicts a platform where the irregularities in public distribution system can be eradicated to a greater extent. This system eliminates man power thereby increasing efficiency and accuracy of the consumables.

## VIII. REFERENCES

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