

## FINGERPRINT AUTHENTICATION AND FACIAL RECOGNITION FOR ATM

**B. Siva Ganga, D. Akhila, K. Dhanush, M. Lalitha, P. Ramurthy**

**Abstract :** Our Project is to develop the technique for fingerprint authentication and facial recognition in ATMs. This target can be mainly decomposed into image pre-processing, feature extraction and feature match. For each sub-task, some classical and up-to-date methods in literature are analyzed. Based on the analysis, an integrated solution for fingerprint recognition, facial recognition and authentication is developed for demonstration. For the program, some optimization at the coding level and algorithm level are proposed to improve the performance of my fingerprint and facial authentication system. These performance enhancements are shown by experiments conducted upon a variety of fingerprint and facial images. Also, the experiments illustrate the key issues of fingerprint recognition and facial recognition that are consistent with what the available literature says "The underlying principle is the phenomenon of biometric and facial "AUTHENTICATION". In this project we propose a method for fingerprint matching and face matching based on minutiae matching."

**Keywords:** Fingerprint, Face, Authentication, detection, recognition

\* Correspondence Author

B. Siva Ganga, Assistant Professor, Department of CSE,

Usha Rama college of Engineering and Technology,

Email: [Sivaganga.cse@gmail.com](mailto:Sivaganga.cse@gmail.com),

D. Akhila, Department of CSE,

Usha Rama college of Engineering and Technology,

Email: [akhilachowday44@gmail.com](mailto:akhilachowday44@gmail.com)

K. Dhanush, Department of CSE,

Usha Rama college of Engineering and Technology,

Email: [Kazadanush@gmail.com](mailto:Kazadanush@gmail.com)

M. Lalitha, Department of CSE,

Usha Rama college of Engineering and Technology,

Email: [lalithavikram1234@gmail.com](mailto:lalithavikram1234@gmail.com)

P. Ramurthy , Department of CSE,

Usha Rama college of Engineering and Technology,

Email:

India.

## 1. INTRODUCTION

Biometric is a field of technology which performs recognition, verification and identification by behavioral and anatomical characteristics. Biometric is the best solution as far as security authentication is considered. In the proposed system, a combination of biometrics is proposed so that the FAR (False acceptance rate) and FRR (False Rejection rate) can be reduced. Recognition used in the description of biometric system like facial recognition, fingerprint, iris recognition relating to their fundamental function, "Recognizing as the biometric input is valid or not. The Recognition confirms the input is valid fingerprint or face. Our project is to develop the technique for fingerprint authentication and facial recognition in ATMs. This target can be mainly decomposed into image pre-processing, feature extraction and feature match. For each sub-task, some classical and up-to-date methods in literature are analyzed. Based on the analysis, an integrated solution for fingerprint recognition, facial recognition and authentication is developed for demonstration.

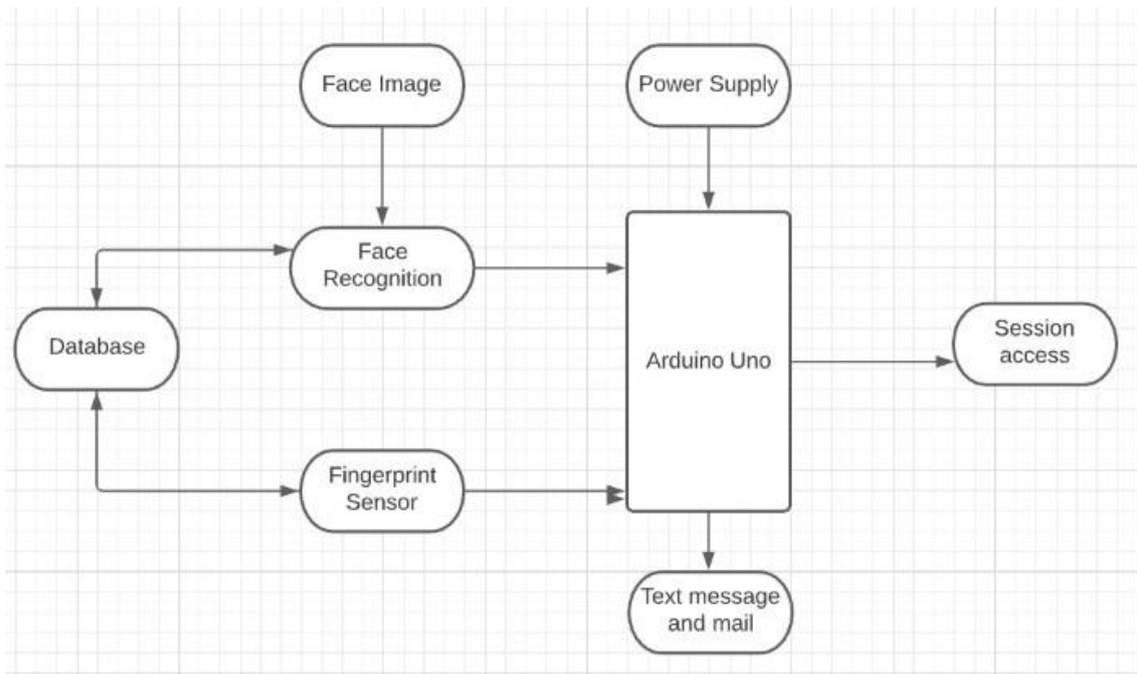
## 2. DESIGN

In this proposed system we have developed an additional way to access the account through face recognition and fingerprint. In this system, fingerprints and face image are used for Authentication purposes. The face image of the person is compared with the database image and then followed by the recognition of fingerprint. When both the recognition schemes match with a same single individual, access for that account will be provided. Here Adriano Uno microcontroller is used in the controlling part. The Fingerprint scanner Id and face Id are searched in a database where the other details of the user account will be stored. The Adriano Uno microcontroller performs the search operation in the database and sends the necessary information to a display device. Open CV libraries are used for the process of recognition, verification and identification of face images. The fingerprint libraries are used for the above-mentioned process for fingerprints. The program for the process is coded in python. Our model consists of two modules they are

**Fingerprint Detection Module:** A Fingerprint is the pattern of ridges and valleys on the surface of a fingertip. Each individual have unique Fingerprints. Uniqueness of a fingerprint is exclusively determined by the local ridge characteristics and their relationships. The ridges and valleys in a fingerprint alternate, flowing in a local constant direction.

**Facial Recognition Module:** A Facial recognition system is a technology capable of matching a human face from a digital image or a video frame against a database of faces typically employed to authenticate users to id verification services, works by pinpointing and measuring facial features from a given image. Facial detection is a broader term than face recognition. Face detection just means that a system is able to identify that there is a human face present in an image or video.

### 3. FIGURE



### 4. ANALYSIS

In the modern world the technology increases then the security in transactions also plays a key role. In our present generation the System Card less ATM uses fingerprint recognition and face recognition instead of an ATM card for authenticating the user. The user information is stored into the database while the user opens an account in the bank. The information such as name, email id, mobile number, fingerprints, and face-print is registered into the database. The card less ATM uses fingerprint recognition and face recognition techniques for authentication and authorization.

### 5. RESULTS

The face image of the person is compared with the database image and then followed by the recognition of fingerprint. When both the recognition schemes match with the same single individual, access for that account will be provided. The Fingerprint scanner Id and face Id are searched in a database where the other details of the user account will be stored. The objective of our project is to provide biometric security through fingerprint facial authentication in ATM applications. Also the experiments illustrate the key issues of fingerprint recognition facial recognition that are consistent with what the available literatures.

```

Anaconda Prompt (Anaconda3): python main.py
usleep(1000000000.0), self.sleep(obj)
File "C:\ProgramData\Anaconda3\lib\site-packages\kivy\clock.py", line 504, in _usleep
kernel32.WaitForSingleObject(obj, 0xffffffff)
KeyboardInterrupt
^C
(kivy_venv) (base) C:\Users\akhill\Desktop\ai\ata-project>python main.py
Traceback (most recent call last):
  File "main.py", line 3, in <module>
    from main_camera import DesktopApp
  File "C:\Users\akhill\Desktop\ai\ata-project\main_camera.py", line 41
    webbrowser.open_new_tab(url)
    ^
IndentationError: unexpected indent

(kivy_venv) (base) C:\Users\akhill\Desktop\ai\ata-project>python main.py
[INFO ] [Logger ] Record log in C:\Users\akhill\kivy\logs\kivy_21-07-04_0.txt
[INFO ] [Image ] Successfully imported "kivy_deps.gstreamer" 0.1.1?
[INFO ] [Image ] Successfully imported "kivy_deps.angle" 0.3.0
[INFO ] [Image ] Successfully imported "kivy_deps.glew" 0.3.0
[INFO ] [Image ] Successfully imported "kivy_deps.sdl2" 0.3.1
[INFO ] [Kivy ] v2.0.0
[INFO ] [Kivy ] Installed at "C:\ProgramData\Anaconda3\lib\site-packages\kivy\_install.py"
[INFO ] [Python ] v3.8.2 (tags: v3.8.2, Apr 13 2021, 15:08:03) [MSC v.1916 64 bit (AMD64)]
[INFO ] [Factory] 186 symbols loaded
[INFO ] [Image ] Providers: img_tex, img_dds, img_sdl2, img_pil (img_ffpyplayer ignored)
[INFO ] [Text ] Providers: sdl2
Face Recognition calling
Place your face properly facing to camera
  
```



## 6. CONCLUSIONS

The combination of Biometrics will always result in high security. The Face and Fingerprint ID as combined, result in a hard-secure authentication. Nowadays they are used in Military bases and government sectors for secure authentication, and their application is still growing. The other new Biometric schemes such as Iris pigmentation, and behavioral characteristics of a person, when combined with the growing field of Artificial intelligence, provide a very advanced authentication technology.

## REFERENCES

1. R. Brunelli, Template Matching Techniques in Computer Vision: Theory and Practice,
2. Wiley, ISBN 978-0-470-51706-2, 2009 ([1] TM book).
3. Williams, Mark. "Better Face-Recognition Software"  
<http://www.technologyreview.com/Infotech/18796/?a=f>. Retrieved 2008-06-02.
4. R. Babaei, O. Molalapata and A. A. Pandor, Face Recognition Application for Teller Machines (ATM), in ICIKM, 3rd ed. vol.45, pp.211-216, 2012.
5. Hong, L., Wan, Y. and Jain, A. Fingerprint Image Enhancement: Algorithm and Performance Evaluation