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Facial Identity

A Facial Recognition System for Payment

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I. Abstract

Face recognition is an important application of the Image process in growing to its use in many fields. Identification of individuals in an organization for the purpose of Payment is one such application of face recognition. The prevalent techniques and methodologies for Payment involves Frauds and Handling of Cards and remembering long passwords. The proposed system aims to overcome the pitfalls of the existing systems and provides features such as detection of faces, a secure payment web application, a user-friendly system.

In our facial identity project, a computer system will be able to find and recognize human faces fast and precisely using Web Camera (i.e Live Detection). Numerous algorithms and techniques have been developed to improve facial identity performance, but the concept to be implemented here is Deep Learning. It helps detect the user's face by retracing it with the stored coordinates while doing the payment process. The details of images and personal details are stored in the database. Live Detection of Face is involved while storing and retrieving the face coordinates. Facial identification makes the Payment method very simple for users.

In addition, there will be two different portals in our system. The system includes the Admin portal and User portal. In Admin-portal, there is one admin from one particular bank (say ICICI). Admin has four different options, first to view the List of Customers, second to Add User, third to Update an existing user, and fourth to Delete any existing user. In add user, the admin has to provide all the necessary details of a user. In Update user, admin can update the details of the user. In Delete user, the user

can be deleted by the admin. In User-portal, users can sign-up only if the admin has added the user to our system. During sign-up user has to fill in some necessary details and then OTP is sent on the registered email. After confirmation, the Facial Recognition part comes, where the user's Facial details are stored in our system. The user can now log in and make payments through our system.

Keywords- Facial Recognition, Payment, Banking System, Face Co-ordinates.

Website Link: <https://smile-pay.herokuapp.com/>

II. INTRODUCTION

The offline method for Payment is limited by many factors such as distance and acceptance of another party. Card frauds – All of us heard about the credit card and debit card fraud reports. So, we have tried to implement a facial identity live detection Payment system involving minimal frauds.

The current payment systems involve a lot of time and long procedures. Face biometrics is rapidly gaining acceptance with consumers and businesses alike as a convenient and secure method of identity verification because it is a one snap show.

A category of biometric software that maps and stores an individual's facial features mathematically is termed Facial Recognition. The objective is to propose a system that is the

fastest and simplest method with advanced securities for Payment methods.

This online system is known as "Smile Pay". Facial recognition is the process of identifying or verifying the identity of a person using their face. It captures analyses and compares patterns based on the person's facial details. Our system involves live detection of the face which stores 128 coordinates of the face which are being matched with the live face coordinates. Effectively and efficiently analysing the features related to facial information is a challenging task that requires a lot of time and effort.

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III. RELATED WORK

The background Research for this work included the study of related work on Deep face. It is a deep learning facial recognition system created by a research group at Facebook. It identifies human faces in digital images. It employs a nine-layer neural network with over 120 million connection weights and was trained on four million images uploaded by Facebook users. Deep Face shows human-level performance. The Facebook Research team has stated that the Deep Face method reaches an accuracy of $97.35\% \pm 0.25\%$ where human beings have 97.53%. This means that Deep Face is sometimes more successful than the human beings. It also leaves behind the FBI's Next Generation Identification system which have 85% performance One of the creators of the software, Yaniv Taigman, came to Facebook via their 2007 acquisition of Face.com.

Meghvii attracted our research on Facial Recognition as it is Most Known for Face++ Technology. Face++ can detect faces, analyse 106 data points on the face, and confirm a person's identity with a high degree of accuracy. It's also an open platform and lets any developer create apps using its algorithms, which has helped make it the most extensive facial recognition platform in the world with 300,000 developers from 150 countries using it. The more data that gets fed into it, the better it becomes. At present, these facial recognition systems are targeted because there isn't enough computing power available to support a non-targeted system.

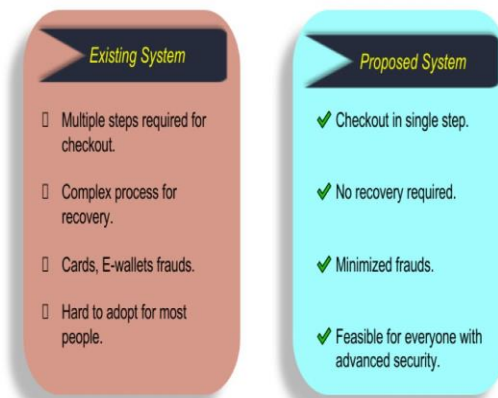
We also analysed Apple's Face ID. It is a facial-recognition technology that launched on the iPhone X in 2017. The technology replaces Apple's Touch ID fingerprint scanning system for the company's latest iPhones, including the iPhone 11, 11 Pro, and 11 Pro Max and it will likely be found on future iPhones too. Face ID uses a "True Depth camera system", which consists of sensors, cameras, and a dot projector at the top of the iPhone display in the notch to create a detailed 3D map of your face. Every time you look at your phone, the

system will conduct a secure authentication check, enabling your device to be unlocked if it recognises you.

Lacuna of the Existing System

- Handling of cards.
- Remembering long passwords.
- Card frauds.
- Consumes lot of time.
- Complex process

Lacuna of existing System & Problem Statement



IV. PROPOSED SYSTEM

Admin Portal: Admin portal consists of four selections i.e List of Customers, Add Customers, update customers and Delete Customer.

List of Customers:

- i It generally redirects us to a list/table of all customers registered on the portal by the admin.
- ii Admin can easily check for an individual about its attributes.

Add Customer:

- i Only Admin can add its bank account holders to its website through Add Customer.
- ii Add Customer directs admin to a form to fill in the necessary detail of an account holder.

Update Customer:

- i A table of customers along with details and the update button is displayed and the admin can update any particular detail of the Customer.
- ii A form appears in which previous details of the customer are displayed and the admin can update as many details are required.

Delete Customer:

- i A table of customers is displayed along with all the details of the users and the admin can click on delete to deactivate the account of that customer
- ii A dialogue box appears asking the reason for the deactivation of the account before deletion.

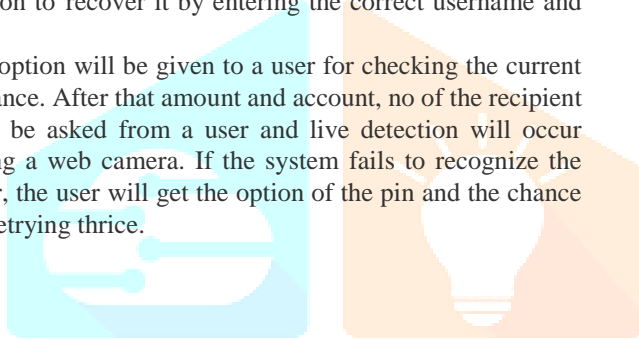
User Portal:

Signup:

- i The user can sign-up only if the user is already added by the admin (i.e the user must have the account in our bank).
- ii The OTP is sent to the registered email of the user. The facial details of the user are then stored in the system.

Login:

- i User will log in by submitting the correct username and password if the user forgets the password then there is an option to recover it by entering the correct username and pin.
- ii An option will be given to a user for checking the current balance. After that amount and account, no of the recipient will be asked from a user and live detection will occur using a web camera. If the system fails to recognize the user, the user will get the option of the pin and the chance of retrying thrice.



B. Image transformation:

This step includes the transformation of captured image into a link using the canvas library.

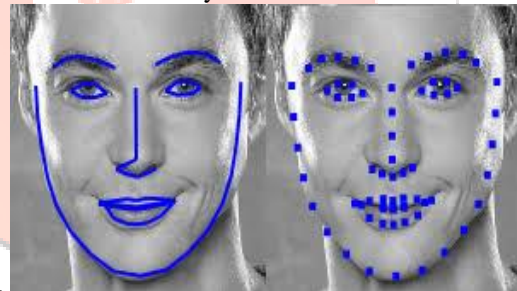
C. Storing in database:

This link which includes the 64 facial co-ordinates is then stored in the database.



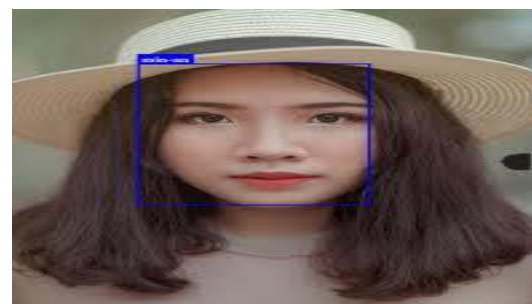
D. Retrieving of facial points:

When the Payment is requested by the user, then from the stored link, we retrieve the 64 facial co-ordinates using the float 32-bit array



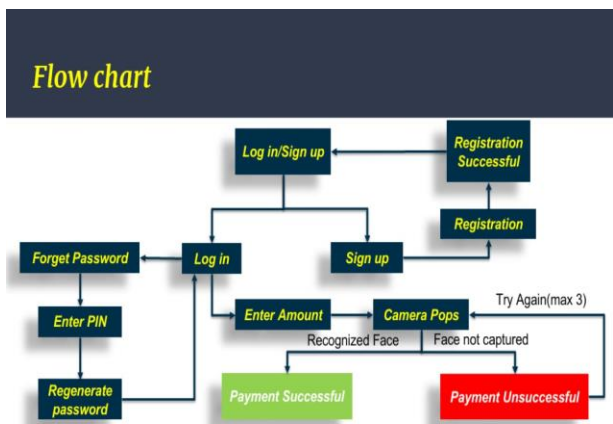
E. Comparison of stored data with live data:

The stored details are now compared with the live facial details of the user using face.api library.



F. Result of the comparison:

If current facial attributes are equivalent to the stored facial attributes then the Payment is successful otherwise Payment fails.



V. ALGORITHM APPLIED

A. Image Capturing:

Firstly, the web camera pops up and the image is captured through it.

VI. TECHNOLOGY-USED

- NodeJS
- Express
- MongoDB
- HTML,CSS,Bootstrap
- Javascript
- Face-api.js



VII. ADVANTAGES

- 1) It reduces human interaction during these corona times and faster approach
- 2) It is advance technique that also enables computer vision applied for payment procedures
- 3) Facial ID verification has higher acceptability as it has many benefits
- 4) Eliminate the threat of identity fraud with secure payments
- 5) The security of the system cannot be
- 6) breached owing to a strong authentication
- 7) process consisting of OTP verification, Facial recognition

VIII. CONCLUSION

Face recognition technology has come a long way in the last twenty years. Facial recognition systems are also highly effective in producing results, all thanks to the use of neural network Algorithms. Our brain recognizes different features of a face – the space between the eyes, the height of a hairline, the width of a nose – subconsciously. The facial recognition algorithms need to do that intentionally. Today, machines can automatically verify identity information for secure transactions, for surveillance and security tasks, and access control to buildings, etc.

This implies that future smart environments should use the same modalities as humans, and have approximately the same limitations. However, next-generation face recognition systems are going to have a widespread application in smart environments -- where computers and machines are more like helpful assistants. Face recognition technology is used in many industries, from a way to pass the time to matters of national security.

Facial recognition software can pick a person out of a crowd, but the vending machine at a work can't recognize a dollar with a bent corner. Therefore, Facial Identity is our future.

IX. REFERENCES

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