

## DEEP LEARNING MODEL BASED CARD LESS ATM TRANSACTION USING FACE RECOGNITION SYSTEM

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### ABSTRACT

In the technological advances in monetary infrastructure, most bank customers opt to use Automatic Teller Machines (ATM) for carrying out their banking transactions. To improve the security of those transactions, a brand new era ATM device that's primarily based on face reputation system which replaces ATM card with Deep Learning Model. The modern-day ATM (Automated Teller Machine) machine uses ATM card and PIN (Pin Identification Number) for authentication. This machine is probably to be harmed by using many protection troubles consisting of theft of ATM card, skimming, Lebanese loop and so forth. So on this challenge; we advocate a machine that uses face reputation authentication (now not ATM playing cards) for gaining access to person account alongside PIN that's extra cozy and reliable than the prevailing gadget. Here we're using the CNN model (Deep Learning Model) for face recognition.

**Keywords:** ATM, PIN, Deep Learning Model, Face Reputation System, Banking Transactions.

### I. INTRODUCTION

An Automatic Teller Machines (ATM) is an electronic banking outlet that allows clients to finish simple transactions without the aid of a branch consultant or teller. Anyone with a credit card or debit card can get entry to coins at maximum ATMs. ATMs are handy; permitting customers to perform quick self-service transactions for instance deposits, coins withdrawals, bill bills, and transfers between accounts.

Using an ATM, customers can get right of entry to their bank deposit or credit score accounts a good way to make a ramification of financial transactions, maximum extensively cash withdrawals and stability checking, in addition to transferring credit score to and from cell telephones. ATMs also can be used to withdraw coins in another country. If the foreign money organism withdrawn as of the ATM is dissimilar from that in which the financial organization account is denominated, the cash might be converted on the economic organization's change rate. Customers are generally diagnosed by means of placing a plastic ATM card (or some other ideal charge card) into the ATM, with authentication being by using the patron entering a private identification variety (PIN), which should suit the PIN stored in the chip on the cardboard (if the card is so prepared), or inside the issuing economic institution's database.

According to the ATMIA, as of 2015, there were near to three. Five million ATMs established global. However, the usage of ATMs is step by step declining with the growth in cashless fee structures.

### II. EXISTING SYSTEM

The ATM using Face Recognition System is imply the way to plenty of forgery attempt and abuse via card robbery and pin robbery of customer account info. In this system they may be used many additives like Face Detector, Face Recognizer, 2-D, three-D Technique and Surface Texture Analysis. In the existing System they use some of the gadget gaining knowledge of techniques to predict the facial features but the output accuracy is very low it may be < 70%.

### III. PROPOSED SYSTEM

The proposed system we use Convolution Neural Network to predict the face recognition.

Its consists of the following steps:

- The face in image is detected and cropped,
- The cropped image is pre-processed in order to provide further illumination invariant,

- The convolution neural network is applied to predicted features.

**3.1 Face Recognition**

A facial popularity machine is a technology able to matching a human face from a digital picture or a video body in opposition to a database of faces, typically hired to authenticate users through ID verification offerings, works by means of pinpointing and measuring facial capabilities from a given photo.

While to start with a form of computer software, facial popularity structures have visible wider uses nowadays on smart phones and in different styles of era, which includes robotics. Because automated facial reputation involves the size of a human's physiological traits facial recognition structures are categorised as biometrics. Although the accuracy of facial reputation structures as a biometric technology is decrease than iris popularity and fingerprint popularity, it is extensively adopted because of its contactless manner. Facial reputation systems have been deployed in advanced human-computer interaction, video surveillance and automatic indexing of pix. They also are used extensively with the aid of law enforcement organizations.

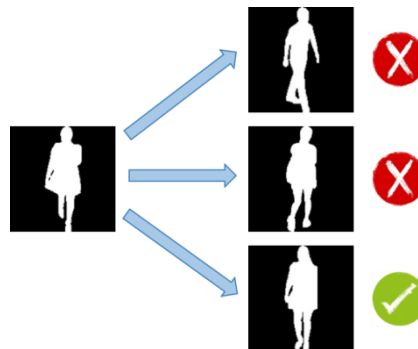


**Fig. 1** Face Recognition ATM

**3.2 Techniques for face recognition**

**3.2.1 Human Identification at a distance**

To permit human identity at a distance (HID) low-resolution pics of faces are superior the use of face hallucination. In CCTV imagery faces are often very small. But because facial reputation algorithms that identify and plot facial capabilities require high resolution photos, resolution enhancement strategies have been advanced to permit facial reputation structures to work with imagery that has been captured in environments with a excessive sign-to-noise ratio. Face hallucination algorithms which might be carried out to pics prior to the ones photos being submitted to the facial recognition gadget utilise instance-primarily based gadget studying with pixel substitution or nearest neighbour distribution indexes that can additionally incorporate demographic and age related facial traits. Use of face hallucination strategies improves the overall performance of high decision facial reputation algorithms and can be used to overcome the inherent obstacles of remarkable-resolution algorithms. Face hallucination techniques are also used to pre-treat imagery where faces are disguised.



**Fig. 2** Human Identification at a distance

Here the conceal, such as sun tinted lenses, is eliminate and the face delusion algorithm is functional to the photograph. Such face delusion algorithms need to learn on similar face pix with and without hide. To fill in the place exposed by disposing of the hide, face hallucination algorithms want to correctly map the complete state of the face, which can be now not possible because of the non permanent facial expression captured in the low resolution image.

### 3.2.2 ID Verification

The rising use of facial recognition is in the use of ID verification offerings. Many businesses and others are running within the marketplace now to provide these services to banks, ICOs, and different e-businesses. Face recognition has been leveraged as a form of biometric authentication for various computing structures and devices; even as Microsoft delivered face recognition login to its Xbox 360 online game console thru its Kinect accent, in addition to Windows 10 through its "Windows Hello" platform (which requires an infrared-illuminated camera). In 2017 Apple's iPhone X Smartphone delivered facial recognition to the product line with its "Face ID" platform, which uses an infrared illumination device.



**Fig. 3 ID Verification**

### 3.2.3 Face ID

Apple added Face ID at the flagship iPhone X as a biometric authentication successor to the Touch ID, a fingerprint based totally gadget. Face ID has a facial popularity sensor that consists of elements: a "Romeo" module that tasks greater than 30,000 infrared dots onto the user's face, and a "Juliet" module that reads the pattern. The pattern is despatched to a local "Secure Enclave" inside the device's valuable processing unit (CPU) to affirm a match with the telephone proprietor's face. The facial sample is not accessible via Apple.



**Fig. 4 Face ID in ATM**

The machine will no longer paintings with eyes closed, with the intention to prevent unauthorized get right of entry to. The generation learns from modifications in a consumer's look, and as a result works among scarves, hats, plenty, and glasses of sunglasses, beard and make-up. It furthermore works in the dark. This is done with the aid of the usage of a "Flood Illuminator", that's a dedicated infrared flash that throws out invisible infrared mild onto the consumer's face to correctly study the 30,000 facial points.

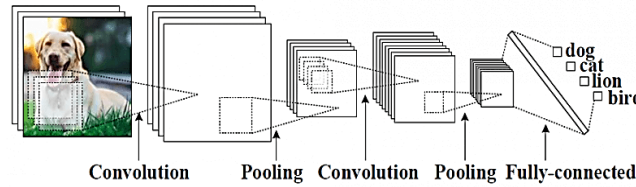
## IV. DEEP LEARNING

### 4.1 Convolutional Neural Network

In deep studying, a convolutional neural community is a category of deep neural network, maximum typically applied to analyzing visual imagery. They are also called shift invariant or area invariant synthetic neural network, mainly based scheduled their shared-weights planning and translation invariance qualities. They have applications in picture and video reputation, recommender structures, picture category, scientific image evaluation, natural language processing, and economic time collection.

CNNs are regularizing version of multilayer perceptrons. Multilayer perceptrons naturally imply entirely related networks, that is, each neuron in one layer is connected to all neurons inside the next layer. The "completely-connectedness" of these networks makes them liable to overfitting data. Typical methods of regularization include adding a few shape of significance size of weights to the loss characteristic. CNNs take a

distinctive technique closer to regularization: they take gain of the hierarchical sample in statistics and collect more complex styles the use of smaller and less difficult styles. Consequently, on the size of connectedness and difficulty, CNNs are at the lower excessive.



**Fig. 5** Architecture of Convolutional neural network

**Steps in CNN**

- Step 1: Convolution
- Step 2: Max pooling
- Step 3: Flattening
- Step 4: Fully connection

**V. IMPLEMENTATIONS OF PYTHON**

The ATM Program in Python is a completely useful console-based totally software developed in Python that covers all the functions that IT students and computer-related publications would require for their university projects or assignments. These can be useful articles and initiatives which you are searching out. This ATM Program is a simple console-based totally ATM emulator to allow you to screen your account balances easily. It has all the important functions. There isn't any database connection, and no external textual content or other files are used to keep consumer information on this little task. Everything, consisting of the pin code and the quantity, is about in the supply code. This Python ATM Program is quite useful, and the concept and good judgment of the venture are simple to understand.

**5.1 Complete Source Code**

```
#!/usr/bin/python
import getpass
import string
import os

# creatinga lists of users, their PINs and bank statements
users = ['user1', 'user2', 'user3']
pins = ['1234', '2222', '3333']
amounts = [1000, 2000, 3000]
count = 0

# while loop checks existance of the enterd username
print("*****")
print("*")
print("*      Welcome to IT SOURCECODE ATM SYSTEM      *")
print("*")
print("*****")
while True:
    user = input("\nENTER USER NAME: ")
    user = user.lower()
    if user in users:
        if user == users[0]:
            n = 0
            elif user == users[1]:
```

```
        n = 1
    else:
        n = 2
    break
else:
    print('-----')
    print('*****')
    print('INVALID USERNAME')
    print('*****')
    print('-----')
# comparing pin
while count < 3:
    print('-----')
    print('*****')
    pin = input('PLEASE ENTER PIN: ')
    print('*****')
    print('-----')
    if pin.isdigit():
        if user == 'user1':
            if pin == pins[0]:
                break
            else:
                count += 1
                print('-----')
                print('*****')
                print('INVALID PIN')
                print('*****')
                print('-----')
                print()
        if user == 'user2':
            if pin == pins[1]:
                break
            else:
                count += 1
                print('-----')
                print('*****')
                print('INVALID PIN')
                print('*****')
                print('-----')
                print()
        if user == 'user3':
            if pin == pins[2]:
                break
            else:
```

```

        count += 1
        print('-----')
        print('*****')
        print('INVALID PIN')
        print('*****')
        print('-----')
        print()
    else:
        print('-----')
        print('*****')
        print('PIN CONSISTS OF 4 DIGITS')
        print('*****')
        print('-----')
        count += 1
# in case of a valid pin- continuing, or exiting
if count == 3:
    print('-----')
    print('*****')
    print('3 UNSUCCESSFUL PIN ATTEMPTS, EXITING')
    print('!!!!YOUR CARD HAS BEEN LOCKED!!!!')
    print('*****')
    print('-----')
    exit()
print('-----')
print('*****')
print('LOGIN SUCCESSFUL, CONTINUE')
print('*****')
print('-----')
print()
print('-----')
print('*****')
print(str.capitalize(users[n]), 'welcome to ATM')
print('*****')
print('-----ATM SYSTEM-----')
# Main menu
while True:
    #os.system('clear')
    print('-----')
    print('*****')
    response = input('SELECT FROM FOLLOWING OPTIONS: \nStatement_(S) \nWithdraw__(W)
\nLodgement_(L) \nChange PIN_(P) \nQuit_____(Q) \nType The Letter Of Your Choices: ').lower()
    print('*****')
    print('-----')
    valid_responses = ['s', 'w', 'l', 'p', 'q']

```

```
response = response.lower()
if response == 's':
    print('-----')
    print('*****')
    print(str.capitalize(users[n]), 'YOU HAVE ', amounts[n], 'EURO ON YOUR ACCOUNT.')
    print('*****')
    print('-----')
elif response == 'w':
    print('-----')
    print('*****')
    cash_out = int(input('ENTER AMOUNT YOU WOULD LIKE TO WITHDRAW: '))
    print('*****')
    print('-----')
    if cash_out%10 != 0:
        print('-----')
        print('*****')
        print('AMOUNT YOU WANT TO WITHDRAW MUST TO MATCH 10 EURO NOTES')
        print('*****')
        print('-----')
    elif cash_out > amounts[n]:
        print('-----')
        print('*****')
        print('YOU HAVE INSUFFICIENT BALANCE')
        print('*****')
        print('-----')
    else:
        amounts[n] = amounts[n] - cash_out
        print('-----')
        print('*****')
        print('YOUR NEW BALANCE IS: ', amounts[n], 'EURO')
        print('*****')
        print('-----')
elif response == 'l':
    print()
    print('-----')
    print('*****')
    cash_in = int(input('ENTER AMOUNT YOU WANT TO LODGE: '))
    print('*****')
    print('-----')
    print()
    if cash_in%10 != 0:
        print('-----')
        print('*****')
        print('AMOUNT YOU WANT TO LODGE MUST TO MATCH 10 EURO NOTES')
```



```

print('*****')
print('-----')
else:
    amounts[n] = amounts[n] + cash_in
    print('-----')
    print('*****')
    print('YOUR NEW BALANCE IS: ', amounts[n], 'EURO')
    print('*****')
    print('-----')
elif response == 'p':
    print('-----')
    print('*****')
    new_pin = str(getpass.getpass('ENTER A NEW PIN: '))
    print('*****')
    print('-----')
    if new_pin.isdigit() and new_pin != pins[n] and len(new_pin) == 4:
        print('-----')
        print('*****')
        new_ppin = str(getpass.getpass('CONFIRM NEW PIN: '))
        print('*****')
        print('-----')
        if new_ppin != new_pin:
            print('-----')
            print('*****')
            print('PIN MISMATCH')
            print('*****')
            print('-----')
        else:
            pins[n] = new_pin
            print('NEW PIN SAVED')
    else:
        print('-----')
        print('*****')
        print(' NEW PIN MUST CONSIST OF 4 DIGITS \nAND MUST BE DIFFERENT TO PREVIOUS
PIN')
        print('*****')
        print('-----')
elif response == 'q':
    exit()
else:
    print('-----')
    print('*****')
    print('RESPONSE NOT VALID')
    print('*****')

```

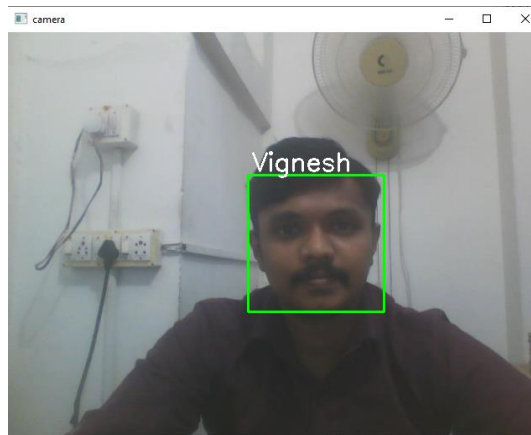


```
print('-----')
```

## VI. RESULTS & DISCUSSION

Facial reputation is the class of biometric software that maps a man or woman's facial capabilities mathematically and shops the information as a face-print. The software uses deep studying algorithms to evaluate a stay seize or digital picture to the stored face-print so that it will confirm an individual's identification.

In this context, nodal points are endpoints used to measure variable of someone's face, which includes length or width of nostril, the depth of eye and the form of cheekbones. The system captures data for nodal factors on a virtual photo of an man or woman's face and shops the resulting facts as a face-print. The face print is then used as a foundation for evaluation with statistics captured from faces in an picture or video.



**Fig. 6** Face recognition- testing

```
Hello Vignesh, You are logged in, to your account  
Please Enter the 4 digit Code : 1234  
Password Matched
```

### Password matching

```
Please Enter Amount: 200  
please collect your cash  
Your Available Balance is : 300
```

### Transaction

## VII. CONCLUSION

This paper can triumph over the issue of impersonation of a cardholder. This is like a issue authentication technique that's used to confirm that the transaction is done by the cardboard owner or the people depended on by means of the owner the use of face reputation. It limits the cardboard utilization of the unauthorized customers who keep the password of a person's card. Thus, these ATM models presents protection towards exploitation of identification, through using a verification gadget the usage of face popularity to the identity and affirm the consumer and it will cut back compelled transactions to an exceptional extent.

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