SECURE ONLINE PAYMENT WITH FACE DETECTION

DHANALAKSHMI.G 1, JANANEESWARI.D 2, JEROMI.P 3, ANUMULU SADHANA 4

[1]ASSOCIATE PROFESSOR, Department of Information Technology, Panimalar Institute of Technology, Chennai.
[2],[3],[4]UG SCHOLAR, Department of Information Technology, Panimalar Institute of Technology, Chennai.

---***---

ABSTRACT: To enhance the security of the transaction by giving 2 - step authentication i.e.. Face detection and proxy detection before entering the UPI pin in the transactions. Our project identifies even if a person tries to make a proxy transaction , and prohibits from the process. We use Face net Algorithm where embed 128 features point of each person face will be calculated with triplet loss function. Advantage of our proposed system is Proxy Detection will be implemented using image processing technique. This provided more secure to the system.

INTRODUCTION

Now-a-days Online Transaction plays a major role. In this pandemic situation most of the people prefer online transaction. So the online transaction rate also increased in recent years. To enhance the security of the transaction by giving 2 - step authentication i.e..Face detection and proxy detection before entering the UPI pin in the transactions. It identifies even if a person tries to make a proxy transaction ,and prohibits from the process. We use Face net Algorithm where embed 128 features point of each person face will be calculated with triplet loss function. Advantage of our proposed system is Proxy Detection will be implemented using image processing technique. This provided more secure to the system.

RELATED WORKS:

1.   Real-Time Implementation Of Face Recognition System

Neel Ramakant Borkar, Sonia Kuwelkar, Description :

Face Recognition is the ability to detect and recognize a person by their facial characteristics. Face is multidimensional and hence requires a lot of mathematical computations. Face recognition system is very essential and important for providing security, mug shot matching, law enforcement applications, user verification, user access control, etc and is mostly used for recognition for various applications. Theseall applications require an efficient Face recognition system. There are many methods that are already proposed and have low recognition capability, high false alarm rate. Hence the major task of the research is to develop face recognition systems with improved accuracy and improved recognition time of a face recognition system. This paper proposes a hybrid face recognition algorithm by combining two face recognition techniques by integrating (PCA) principal Component Analysis, (LDA) Linear Discriminant Analysis. The Jacobi method is used to compute Eigenvectors that are necessary for PCA and LDA algorithms. Face Recognition system will be implemented on embedded system based Raspberry pi 3 board.

Publication: 2017, *International Conference on Computing Methodologies and Communication (IC CMC)*

2   Implementation QR Code Biometric Authentication for Online Payment

Agostinho Marques Ximenes, Sritrusta Sukaridhoto, Amang Sudarsono, Mochammad Rif Description:

Based on the Indonesian of Statistics the level of society of people in 2019 will grow. Based on data, the bank conducted a community to simple transaction payment in the market. Banks just use a debit card or credit card for the transaction, but the banks need more investment for infrastructure and are very expensive. Based on that cause the bank needs another solution for low-cost infrastructure. Obtained from solutions that, the bank implementation QR Code Biometric authentication Payment Online is one solution that fulfills. This application is used for payment in online merchants. The transaction permits in this study lie in the biometric encryption, or decryption transaction permission and QR Code Scan to improve communication security and transaction data. The test results of the implementation Biometric Cloud Authentication Platform show that AES 256 agents can be implemented for face biometric encryption and decryption. Code Scan QR to carry out transaction permits with Face verification transaction permits gets the accuracy rate of 95% for 10 sample people and the transaction process gets a time speed of 53.21 seconds per transaction with a transaction sample of 100 times.

Publications: Ximenes, Agostinho Marques et al. "*Implementation QR Code Biometric Authentication for Online Payment.*" 2019 International Electronics Symposium (IES) (2019): 676-682.

3. Surveying the Development of Biometric User Authentication on MobilePhones

Neel Ramakant Borkar, Sonia Kuwelkar, Description :

Various Biometric authentication methods on phones have been reviewed. Especially on touch enabled mobile phones. In this survey the development of existing biometric authentication techniques only on mobile phones. Designing reliable user authentication on mobile phones is becoming an increasingly important task to protect users' private information and data. Since biometric approaches can provide many advantages over the traditional authentication methods, they have become a significant topic for both academia and industry. The major goal of biometric user authentication is to authenticate legitimate users and identify impostors based on physiological and behavioral characteristics. In this paper, we survey the development of existing biometric authentication techniques on mobile phones, particularly on touch enabled devices, with reference to 11 biometric approaches (five physiological and six behavioral).We present a taxonomy of existing efforts regarding biometric authentication on mobile phones and analyze their feasibility of deployment on touch-enabled mobile phones. In addition, we systematically characterize a generic biometric authentication system with eight potential attack points and survey practical attacks and potential countermeasures on mobile phones. Moreover, we propose a framework for establishing a reliable authentication mechanism through implementing a multimodal biometric user authentication in an appropriate way. Experimental results are presented to validate this framework using touch dynamics, and the results show that multimodal biometrics can be deployed on touch-enabled phones to significantly reduce the false rates of a single biometric system. Finally, we identify challenges and open problems in this area and suggest that touch dynamics will become a mainstream aspect in designing future user authentication on mobile.

Publications: A. M. Ximenes et al., "*Implementation QR Code Biometric Authentication for Online Payment,*" 2019 International Electronics Symposium (IES), Surabaya, Indonesia, 2019, pp. 676-682, doi: 10.1109/ELECSYM.2019.8901575.

4. A Biometric based Payment System by using Payee and Payer Module

Dr.ChitraKiran.N ,Suchira Suresh, Description :

The essential advancement in payment mechanisms has an impact on everyone's standard of life. The latest payment mechanisms offer both advantages and disadvantages for the future. In order to have faster and efficiently suitable processes, contactless payment has got attention with throughput with merchants prospective. These are the problems to the issuers, due to less robust customer verification mechanisms. Thus, various researchers evolved and sustained an efficient, secure payment mechanism. This paper provides an approach and module by which one payee module can communicate with the player module using Bluetooth for money transfer from the payer's to the payee's bank. The significance of this approach is that it eliminates the physical need of case cash and serves for all types of payment and identity needs. The security of this module is intensified using biometric authentication. Finally, the results conclude a secure payment mechanism.

Publications: N. ChitraKiran, B. Teja, S. Suresh, B. Krishna, S. M. Akarsh and J. Yomas, "A biometric based payment system by using payee and payer module," *2017 2nd IEEE International Conference on Recent Trends in Electronics, Information & Communication Technology (RTEICT)*, Bangalore, India, 2017, pp. 2252-2256, doi: 10.1109/RTEICT.2017.8257001.

5. Face Authentication For Banking

B. Hemery, J. Mahier, M. Pasquet and C. Rosenberger Description**:**

This paper analyzes the benefit and the limitations of using a particular biometric technology "namely face authentication" for banking applications. We present first the general concepts of banking. We propose a method in order to replace the PIN code authentication by using biometrics data. Biometric authentication is then detailed. A face recognition method we developed is presented revealing itself as a biometric candidate solution. We show the benefit and limits of this approach to beused in a real industrial context.

Publications: B. Hemery, J. Mahier, M. Pasquet and C. Rosenberger, "Face Authentication for Banking," First International Conference on Advances in Computer-Human Interaction, Sainte Luce, Martinique, France, 2008, pp. 137-142,doi: 10.1109/ACHI.2008.17.

PROPOSED SYSTEM

To overcome the limitations and security holes we have proposed a 2 step authentication in transaction process. Advantage of our proposed system is Proxy Detection will be implemented using image processing technique. This provided more secure to the system. In the proposed system, Face Verification will be implemented using Face Net Deep Learning Algorithm to embed with 128 feature points of the face. Proxy Detection will be implemented using Support Vector Machine(SVM). Embed 128 features point of each person face will be calculated with triplet loss function. Facial features of every person will be classified using SVM. SVMs can efficiently perform a non-linear classification using what is called the kernel trick, implicitly mapping their inputs into high-dimensional feature spaces. The support vector clustering algorithm, applies the statistics of support vectors, developed in the support vector machines algorithm, to categorize unlabeled data, and validates the facial picture. The face is checked with a proxy and the transaction will process and the Balance will be displayed.

COMPONENTS IN EXISTING SYSTEM:

1. Deep Learning-Face Detection and Recognition

2. Machine Learning: SVM-Classifier

3. Image Processing-Fraud Detector

1. Deep Learning-Face Detection and Recognition:

Face Net uses a deep convolution neural network (CNN). The network is trained such that the squared L2 distance between the embeddings corresponds to face similarity. The images used for training are scaled, transformed and are tightly cropped around the face area. The main difference between Face Net and other techniques is that it learns the mapping from the images .It creates embeddings rather than using any bottleneck layer for recognition or verification tasks.

2. Machine Learning: SVM-Classifier:

A Support Vector Machine is based on multi-view face detection and recognition framework. Face detection is carried out by constructing several detectors, each of them in charge of one specific view. An important characteristic of this approach is that it can obtain a robust performance in a poorly constrained environment, especially for low resolution, large scale changes, and rotation in depth. A Support Vector Machine is a supervised classification technique that can actually get pretty complicated but is pretty intuitive at the most fundamental level.

3. Image Processing-Fraud Detector:

We use Open CV for proxy detection which uses HaaR cascade files for object detection. HaaR cascade files are nothing but models trained by Open CV to detect an object of interest in input images. Need of positive samples images containing the object and a lot of negative sample images, containing everything but the object.

This classifier specializes in detecting a person and helps in checking the proxy of the person. This module is used for fraud user i.e..(Proxy) detection in our project.
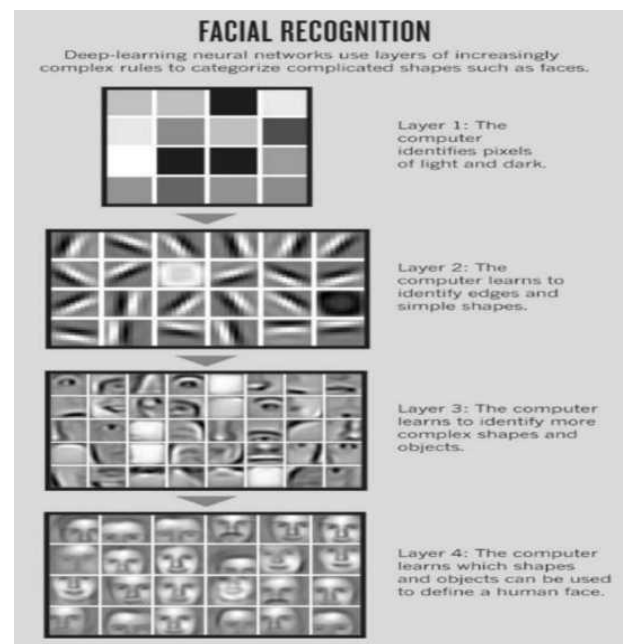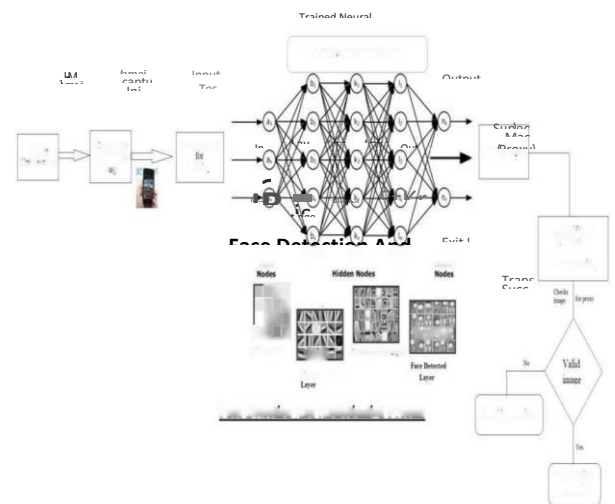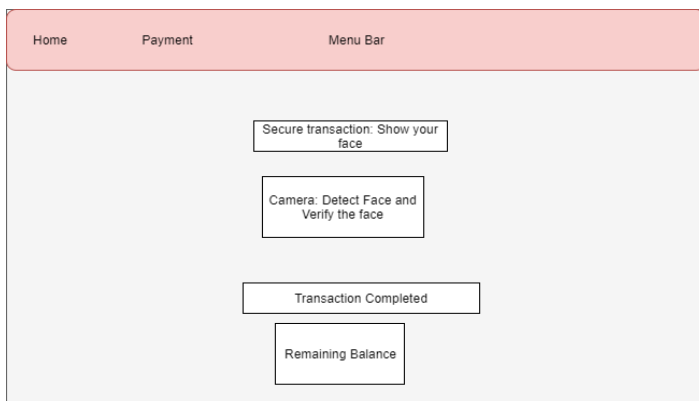
$$\sum_{i}^{N}\left[\|f(x_i^a) - f(x_i^p)\|_2^2 - \|f(x_i^a) - f(x_i^n)\|_2^2 + \alpha\right]_{+}$$

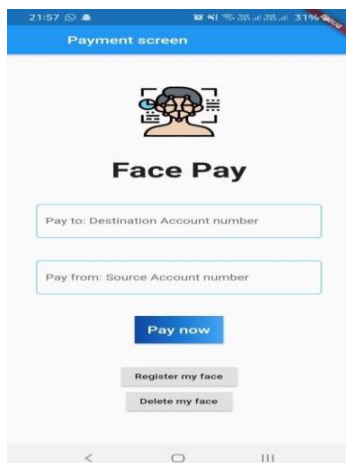X - It represents an image f(*i) - It represents the embedding of An image.

Q - It represents the margin between positive and negative pairs.
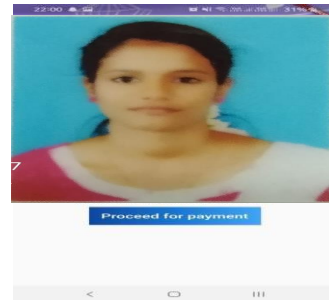
SAMPLE INPUT:

RESULT:

MODULE1:

MODULE 2:

MODULE 3:
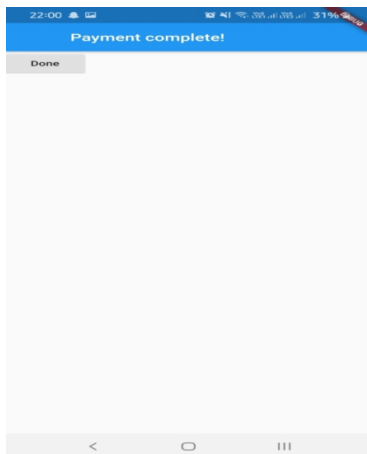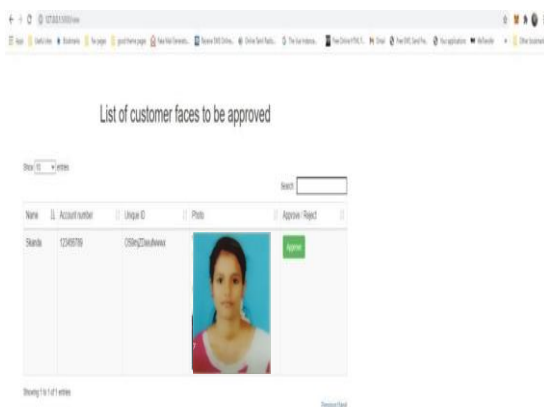

MODULE 4:

MODULE 5:

MODULE 6:

MODULE 7:

CONCLUSION:

To enhance the security of the transaction by giving 2 - step authentication i.e., Face detection and proxy detection before entering the UPI pin in the transactions. Secure Payment is established between the people.

REFERENCES:

[1] Badan pusat statistika Indonesia, "tingkat kemiskinan", access February 11 2019. Available: https://www.bps.go.id.

[2] Ahmad Amran, Surya Michrandi Nasution, Fairuz Azmi," Implementation of Cryptography Algorithm For Biometric Payment". E-proceeding of engineering, Vol.3, No.1 April 2016.

[3] Phil Tresandern and Timothy F. Cootes," Mobile Biometrics: Combined Face and Voice Verification for the mobile platform", IEEE, Books, 2013.

[4] Selvia Rahmawati1, Ichsan Taufik, Gitarja Sandi," Implementasi Algoritma AES(Advanced Encryption Standard) 256Bit Dan Kompresi Menggunakan Algoritma Huffman Pada Aplikasi Voice Recorder", SENTER 2017, 15-16 December 2017.

[5] Microsoft Azure, "Face API Azure Cloud documentation" access February, 2019.Available:https://www.azure.microsoft.com.

[6] J.Zhou, X.G.Lu, D. Zhang, C. Wu, Orientation analysis for rotated human face detection, Image and Vision Computing, 20, 2002, 257- 264.

[7] Weizhi Meng; Wong, D.S.; Furnell, S.; Jianying Zhou,"Surveying the Development of Biometric User Authentication on Mobile Phones," in Communications Surveys & Tutorials, IEEE, vol.17, no.3, pp.12681293, third quarter 2015.

[8] Stefan Rass and Daniel Slamanig, ''Cryptography for security and privacy in cloud computing", Artech House, Boston London., 2014.

[9] Merchant"online-merchant",access-12-May-2019.[online]. Available: https://www.securionpay.com.

[10] Soyuj Kumar Sahoo and S R Mahadeva Prasanna," Bimodal Biometric Person Authentication Using Speech and Face Under Degraded Condition", IEEE, conf. 28-20 Jan 2011, vol. 5, no. 2, Bangalore, India. 2011.

[11] QR Code, "Basic Understanding of QR Code Payment", access april 22 2019.[online].available: www.molpay.com16.

[12] Omri, F, Foufou, S, Hamila, R dan Jarraya, M," cloud-based mobile system for biometric authentication (ITS Telecommunication).2006.

[13] Xudong Cao, Yichen Wei, Fang Wen, Jian Sun," Face Alignment By Explicit Shape Regression", Int J Comput Vis, April 2014, Volume 107.

[14] Rahmawati, E., Listyasari, M., Aziz, A. S., Sukaridhoto, S., Damastuti F. A., Bachtiar, M. M., & Sudarsono, A. (2017, September). Digital signature on file using biometric fingerprint with fingerprint sensor on smartphone. In 2017 International Electronics Symposium on Engineering Technology and Applications (IES-ETA) (pp. 234-238). IEEE.