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Face Recognition for Secure Online payment with Proxy Detection using Face Net Classifier

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A B S T R A C T

In most online transactions, in addition to the user's password, an OTP is used to authenticate the user. OTP is primarily used to improve security and prevent fraudulent actions such as identity theft. In some situations, OTPs aren't very secure. The most significant downside of utilizing OTP is that it may be readily stolen and exploited by someone who knows the concerned user's bank details, including access to the registered mobile phone, allowing money to be transferred without the account holder's awareness. To address this flaw, we suggest a system that employs the account holder's face as a form of authentication and verification. During the initial process, the account holder's face is taken. To extract facial traits, we employ the Face Net algorithm. SVM will be used to classify each person's facial features. The trained face model is compared to the face recognized during the online payment procedure. Payment will be processed successfully if no proxy is discovered and the detected face matches the trained face.

Keywords: OTP, Support Vector Machine, facial features,

1. Introduction

Deep learning networks are based on the human brain's structure and allow us to teach robots to learn by example. This means that once deep learning algorithms have been trained for a long time using sufficiently large and diverse datasets, they can use what they've learned to generate predictions or produce outcomes in response to fresh data. A CNN is a Deep Neural Network (DNN) that is designed to do difficult tasks like image processing, which is essential for facial recognition. CNNs are made up of numerous layers of connected neurons, with an input layer, an output layer, and layers in between. The input for facial recognition is an image, which the CNN breaks down into groups of pixels. These groups are scanned as matrices, with the values within the matrices being multiplied and the results being sent into the next layer. This process continues through each layer until it reaches the output layer, when the network generates an array of 2048 numbers as an output. A face print is the name for this array. To see if there is a match, the computed face print can be compared to another face print (1:1 matching) or to a database of face prints (1: N matching). If two or more face prints are sufficiently similar, they will be registered as a match based on the set confidence levels.

2. Review of Literature

According to the Indonesian Institute of Statistics, the level of society in 2019 will rise. The bank conducted a community to simple transaction payment in the market based on data. Banks only utilize a debit or credit card for transactions, but they require more infrastructure investment and are quite expensive. As a result, the bank need a new low-cost infrastructure solution. One method that fits this requirement is the bank's implementation of QR Code Biometric Authentication Payment Online. This program is used by online merchants to accept payments. The biometric encryption, or decryption transaction permission, and QR Code Scan transaction allows in this study are used to increase communication security and transaction data. The Biometric Cloud Authentication Platform's implementation test findings reveal that AES 256 agents may be used for face biometric encryption and

decryption. Scan the QR code to complete a transaction permit. Face verification transaction permits have a 95 percent accuracy rate for a sample of 10 persons, and the transaction procedure takes 53.21 seconds per transaction for a sample of 100 transactions[1]. In the last half-decade, the popularity of online transactions has resulted in the leakage of user information. Because of modern technologies, the security of the transaction process can be hacked more simply. Biometric verification is seen to be a key to solving security issues. The innovative approach of face matching verification is proposed in this paper to increase the security of online payment systems. The performance of the new proposed method is then tested when a simulation of the online payment process is developed. The testing results suggest that the new proposed face matching verification procedure can improve the usability, capability, and user happiness of online transaction processes while also increasing security. [2] The crucial advancement in payment mechanisms affects everyone's way of living. The most recent payment options have both benefits and drawbacks in the future. In order to have a speedier and more efficient process, contactless payment has gotten a lot of attention from shops. These are the issues that issuers face as a result of less reliable consumer verification systems. As a result, a number of researchers devised and maintained an efficient and secure payment system. This paper describes an approach and module for transferring money from the payer's bank to the payee's bank utilizing Bluetooth communication between two payee modules. The importance of this technique is that it eliminates the physical requirement for carrying cash while also serving as a payment and identity solution. Biometric authentication is used to increase the module's security. Finally, the findings point to a secure payment system[3].

3. Proposed System

Biometrics, such as a person's face, are used in the proposed system to authenticate the account holder. Face recognition is utilized in place of one-time passwords. Multi Task Cascaded Convolutional Neural Networks, Face Net method, and Support Vector Machines are all used.

.3.1.1 Multi Task Cascaded CNN

A convolutional neural network (CNN) is a neural network with one or more convolutional layers that is mostly used for image processing, classification, and segmentation, as well as other auto-correlated data. The multi-tasking Cascaded Convolutional Neural Network is used here. There are three stages to the projected CNNs. It creates candidate windows rapidly in the first stage using a shallow CNN. Then, using a more complicated CNN, it refines the windows to reject a huge number of non-faces windows. Finally, it refines the result and outputs the positions of face landmarks using a more stronger CNN

3.1.2 FaceNet Algorithm

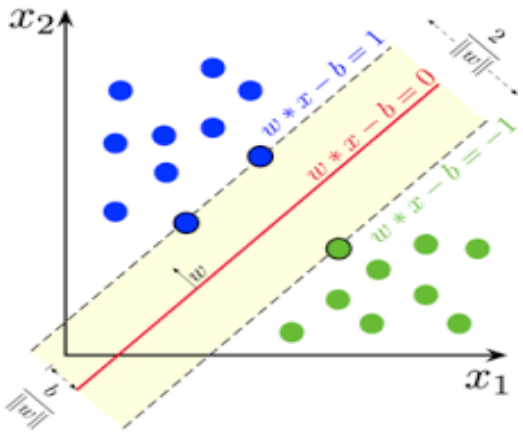
FaceNet was created by Google researchers in 2015. Similar to word embedding, it turns the face into 128D Euclidean space. The 128 dimensional embedding generated by the FaceNet model can be used to successfully cluster faces once it has been trained with triplet loss for distinct classes of faces to capture the similarities and differences between them. Face recognition, verification, and clustering tasks can be simply accomplished using standard approaches with FaceNet embeddings as feature vectors once such a vector space(embedding) has been established. In certain ways, similar faces would be closer together, while non-similar faces would be farther apart.

Euclidean distance:

$$d(\mathbf{p},\mathbf{q}) = d(\mathbf{q},\mathbf{p}) = \sqrt{(q_1 - p_1)^2 + (q_2 - p_2)^2 + \cdots + (q_n - p_n)^2}$$
$$= \sqrt{\sum_{i=1}^{n}(q_i - p_i)^2}.$$

3.1.3 Support Vector Machine:

For two-group classification issues, a support vector machine (SVM) is a supervised machine learning model that uses classification techniques. They may categorize new text after feeding an SVM model a set of labeled training data for each category. A simple example is the easiest way to understand the fundamentals of Support Vector Machines and how they work. Let's say our data contains two features: x and y, and we have two tags: red and blue. We're looking for a classifier that can determine whether a pair of (x,y) coordinates is red or blue. On a plane, we plot our already labeled training data:



In two dimensions, the best hyper plane is a straight line. What is, however, the best hyperplane? It's the one that optimizes the margins from both tags, according to SVM. In other words, the hyper plane (in this case, a line) with the greatest distance to the nearest element of each tag.

.**3.1.4 Proxy Detection:**

In this instance, the proxy refers to "not the real image," implying that someone might fake their identity by exhibiting the photo image of the concerned account holder and posing as the account holder in order to complete a transaction. Using a proxy detector, we were able to stop this fraudulent activity. In this system, the retrieved image is scaled to 160x160 matrixes. Each image's Euclidean distance is determined, and it varies depending on the image. The taken image is reduced to 160x160 throughout the payment process. If we use a photo image as a proxy, the pixel value and Euclidean distance of the scaled image will vary. The proxies will definitely change when comparing the Euclidean distance value calculated for stored samples. We discovered that the Euclidean distance for the proxy picture is greater than 120 after a lot of testing. As a result, if the Euclidean distance is more than 120, the system is trained to recognize those images as proxies and displays a notice such as "Don't try for proxy."

4. Conclusion and Future work

With the help of a proxy detector, the proposed system was able to successfully transfer the payment to the retailer. The system's proxy detector was installed and tested. The system's security is improved by using a proxy detector. In this proposed system, the data is saved in a database; however, to improve security, these data can be stored in a block chain. We can utilize iris for authentication to boost efficiency, but the cost factor is considerable when considering iris.

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REFERENCES

Van der Geer, J., Hanraads, J. A. J., & Lupton, R. A. (2000). The art of writing a scientific article.*Journal of Science Communication, 163*, 51–59.

Strunk, W., Jr., & White, E. B. (1979).*The elements of style* (3rd ed.). New York: MacMillan.

Mettam, G. R., & Adams, L. B. (1999).How to prepare an electronic version of your article. In B. S. Jones & R. Z. Smith (Eds.), *Introduction to the electronic age* (pp. 281–304). New York: E-Publishing Inc.

Fachinger, J., den Exter, M., Grambow, B., Holgerson, S., Landesmann, C., Titov, M., et al. (2004).Behavior of spent HTR fuel elements in aquatic phases of repository host rock formations, 2nd International Topical Meeting on High Temperature Reactor Technology. Beijing, China, paper #B08.

Fachinger, J. (2006). Behavior of HTR fuel elements in aquatic phases of repository host rock formations.*Nuclear Engineering & Design,236*, 54.