

# Transaction Authentication using Face and OTP Verification

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## ABSTRACT

In face authentication system we authenticate a user using one's face and OTP received through mobile communication services this is a two layered authentication system where first the face of the user is verified using traditional face structure authentication then when the authentication process is complete the service provider will send a onetime password to the user mobile number which has to be entered to complete the process.

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## INTRODUCTION

All online transaction and login using browser or android application are done after authenticating the user identity using OTP verification within a time session, but it can still be bypass if the user's mobile device is in possession of the attacker as they will have access to it. So, to solve this problem we are adding facial verification as an extra security layer after which the OTP verification will be done in a given time session, if not verified within that time session the whole transaction or the login will be terminated. As the transaction and the login process has facial verification the authentication process may get slow compared to normal OTP authentication but the security level will be way higher than a normal OTP authentication.

## Motivation:

As mobile devices can be hacked in many ways and if anyone has access to our phone, they can easily initiate a transaction and authenticate it without our permission.

- Misuse of one's phone by friends
- Mobile device highjacked by an attacker illegally
- Unlocked mobile device

## Existing system:

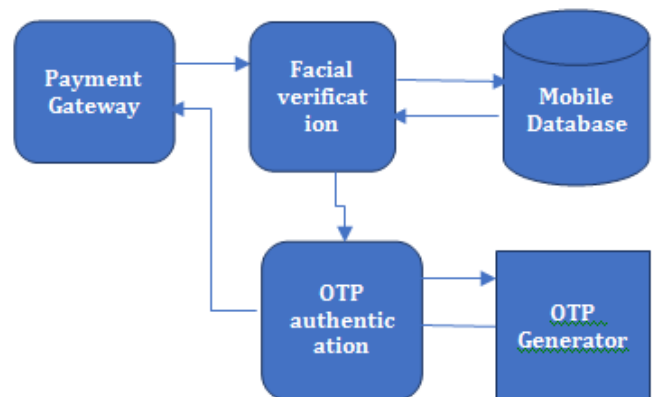
Currently there is a use of simple OTP authentication before a transaction in which the transaction is authenticated using One Time Password. In this a OTP is generated from the One Time Password generator from the bank side, which is then send to the mobile device through SMS services which is then entered in transaction gateway to confirm the transaction.

## Proposed System:

By using two-layer verification system we are trying to secure the user authenticity and increase the security as in normal verification which is in current use has only one layer of security. So, by implementing facial verification before OTP verification it confirms the identity of the person initiating the transaction.

## Architecture:

This gateway will be triggered when the payment gateway will be called, when the payment is initiated the front facing camera of the phone will start capturing the face of the person initiating the transaction which will be verified using the mobile database sample



## Algorithm:

PRINCIPAL COMPONENT ANALYSIS (PCA) Principal Component Analysis (or Karhunen-Loeve expansion) is a

suitable strategy for face recognition because it identifies variability between human faces, which may not be immediately obvious. Principal Component Analysis (hereafter PCA) does not attempt to categorise faces using familiar geometrical differences, such as nose length or eyebrow width. Instead, a set of human faces is analysed using PCA to determine which 'variables' account for the variance of faces. In face recognition, these variables are called eigen faces because when plotted they display an eerie resemblance to human faces. Although PCA is used extensively in statistical analysis, the pattern recognition community started to use PCA for classification only relatively recently. As described by Johnson and Wichern (1992), 'principal component analysis is concerned with explaining the variance-covariance structure through a few linear combinations of the original variables.' Perhaps PCA's greatest strengths are in its ability for data reduction and interpretation. For example a 100x100 pixel area containing a face can be very accurately represented by just 40 eigen values. Each eigen value describes the magnitude of each eigen face in each image. Furthermore, all interpretation (i.e. recognition) operations can now be done using just the 40 eigen values to represent a face instead of the manipulating the 10000 values contained in a 100x100 image. Not only is this computationally less demanding but the fact that the recognition information of several thousand

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