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Biometric Based Field Traffic Violation Report System

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ABSTRACT: Bio-metrics are automated methods of identifying a person or verifying the identity o f a person based on a physiological or behavioral characteristic. As fingerprint identification are unique and reliable human identification method, we will be using them to identify the person and then verify whether they have Driving License issued or no t. A single fingerprint and an image will be sufficient to identify and verify the individual and the vehicle.

Mobile platforms such as smart-phones and tablet computers have acquired the technical capability to function beyond their intended objectives. The continued increase in processing power has led researchers to try increasingly challenging tasks on mobile devices with appropriate modifications over their static counterparts. In this work we describe the main features of software modules designed for Android smart phones used by RTO officials to verify vehicle licenses and documents. In this project we use biometric approaches such as fingerprints and vehicle number plates for verification.

KEYWORDS: Bio-metrics; fingerprint; reliable human identification; verify the individual and the vehicle; Documents

I. INTRODUCTION

Fingerprint identification and pattern matching are segments in an automated fingerprint recognition and authentication system. Finger print matcher, using a digital image processing compares input search with all available data samples in database to make a result of most probable existing match. There are various ways of fingerprint matching that have been proposed which consists of minutiae feature extraction and pattern matching and image processing approaches. One of the best approach is Minutia feature extraction and pattern matching approach that is used in almost all fingerprint authentication and identification system.Fingerprint identification is divided into two main parts: Minutiae feature extraction;Minutiae pattern matching. In early days the fingerprint verification was done using the thumb impression that is been collected using the ink pad and thumb and printing it on a paper . This process is still used in law enforcement applications. Nowadays, it is done using an electronic fingerprint scanner to g et the fingerprint impression. This process is also known as online acquisition. The obtained image may contain sound extracted from the previous processing phase and minutiae extracted from the processed image. The final stage of fingerprint matching is done by transferring small fingerprint patterns to tones. This matcher will produce a measurement score based on the similarity of the fingers.

II. APPLICATIONS

(a) This scheme will help to increase the robustness and speed of the RTO system.
(b) It will also increase the efficiency of theft related processes

III. MOTIVATION

Person has to carry RTO related documents, In case if he fails to carry those mandatory documents then this may lead to fine that is applied by the traffic government authority . This restless and time consuming procedure kept us motivating and inspired us on developing and implementing the RTO based System that will help to increase robustness and enhance the efficiency of previous RTO system and traffic violations.

IV. PROJECT OBJECTIVES

1. Identify a person's information through your fingerprint and make that person a document for free.
2. Fingerprint identification system would help in identification of authorized person of a vehicle.
3. Matching score is occupied by comparing the captured image and image presented in database using bozorth3 Algorithm.
4. This score helps to authenticate identity of the individual.
5. After Authentication The individual will be fined respectively.enerate all the possible routes.

V. PROJECT SCOPE

1. The fingerprint image of an individual is captured from the thumb identification device.
2. The image is then compared using Bozorth3 algorithm in the central database and returns a matching score.
3. If a match is found then details of the person is shown on the Android device.
4. The person will be fined after the verification process algorithm is implemented.

VI. SOFTWARE REQUIREMENTS

1. Front End : Android App
2. Back End : Java(Socket programming)

VII. HARDWARE REQUIREMENTS

1. Processor: Pentium IV+.
2. RAM : 2 GB at least.
3. Hard Disk : 40GB
4. Monitor : color monitor.
5. Android Device : Android Tablet /Mobile with good battery capacity .
6. Fingerprint identification device : Connector / USB cable.
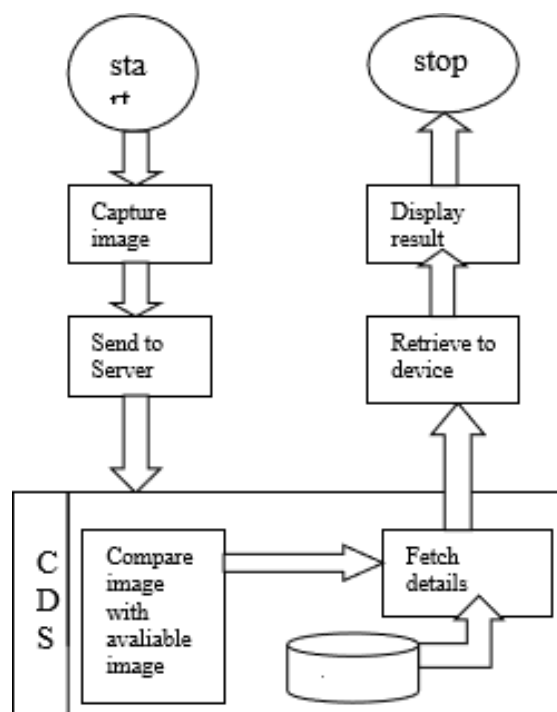
VIII. SYSTEM ARCHITECTURE

Fig 1: System Architecture Diagram of FTVR System
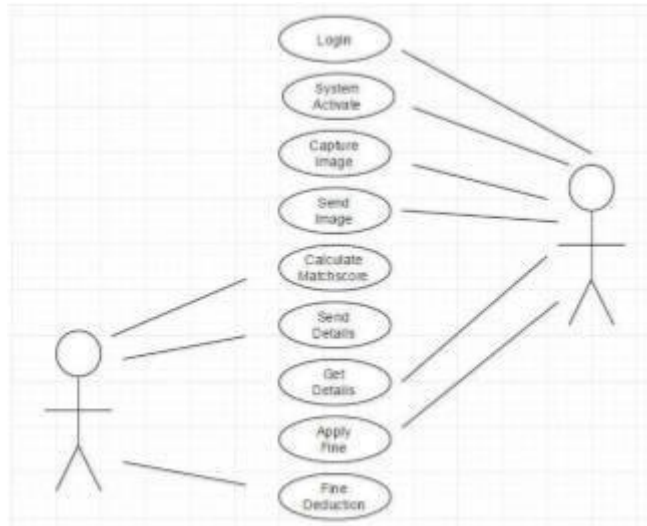
VIII. USE CASE DIAGRAM

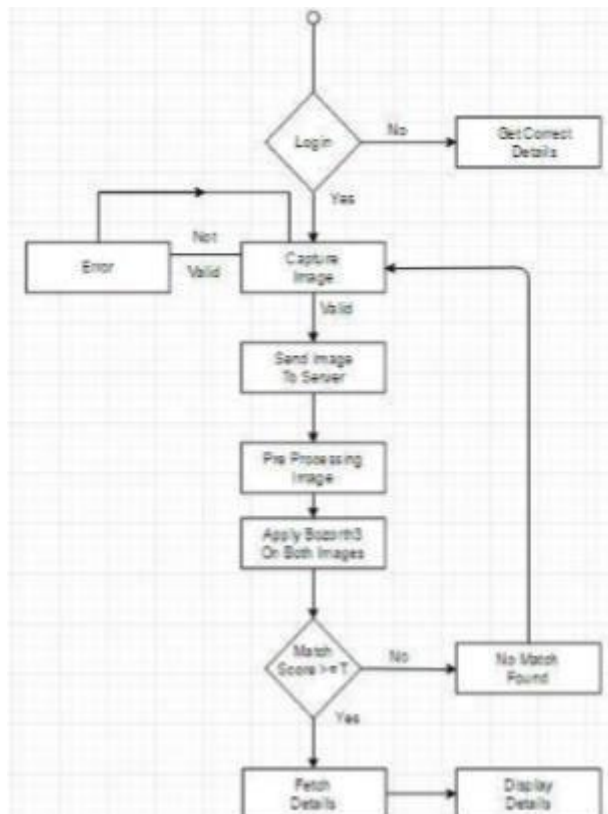Fig 2: Use case diagram of FTVR system

IX. ACTIVITY DIAGRAM

Fig 3: Activity Diagram of FTVR system

X. SOFTWARE INTERFACE

- MySQL : MySQL may be a electronic information service management system that runs as a server providing multiuser access to sort of databases.
- Java : The 2 principal products within the Java SE platform are : Java Development Kit(JDK) and Java SE Runtime Environment(JRE). The JDK is supper set of the JRE, and contains everything that's within the JRE, plus tools rather like the compilers and debuggers necessary for developing applets and applications.
- Java Script : Java Script is primarily utilized within the form of client side Java Script, implemented as a component of application so on produce enhanced user interfaces and dynamic websites.
- JSP(Java Server Pages) : JSP is Java technology that helps software developers server dynamically generated websites supported HTML,XML or other documents types.
- Hypertext Markup Language(HTML) : HTML is additionally a predominant nomenclature for sites.HTML elements are the essential building blocks of website.
- Apache Tomcat : Apache Tomcat is an open source servlet container developed by the Apache Software Foundation(ASF).Tomcat implements the Java Servlet and also the Java Server Pages(JSP) specifications from Oracle.

XI. ASSUMPTIONS

1. User must have basic knowledge of computer and handling an Android device.
2. The user has to be from a police or RTO background.
3. Device used must have Android Installed. 4. After activation system should fetch data from the server.

XII. DEPENDENCIES

- Only Administrators will be able to edit main configurations.
- User and Administrators will communicate among themselves while executing the application.
- The proposed system is dependent on Android OS.

XIII. MATEMATICAL MODEL

$S = \{\{I\},\{P\},\{O\}\}$
Where,
I = Input Set
P = Processing Set
O= Output Set

Input
Input I = { Login, ThumbScanImage }
Login = { Username, Password }
ThumbScanImage = {Thumb Scan Image1, Thumb Scan Image2…………Thumb Scan Imagen}
Username={Username1,Username2…………..Usernamen }
Password={Password1,Password2…………….Passwordn }

Processing
Processing P = {matchscore, sendDetails}
Match M= {X,Y,T}
Where,
X= Minutiae point
Y= Minutiae point
T= Orientation angle theta

Output
Output O = {Document}

- **Finger Print Feature Extraction:**

Construct Intra-Fingerprint Minutiae Comparison Tables: One Table for the probe fingerprint and one table for each gallery fingerprint to match against.(fig1)

Construct an Inter-Fingerprint Compatibility Table: Compare a probe print's minutiae comparison table to a gallery print's minutiae comparison table and construct a new compatibility table. (fig2)

Traverse the Inter-Fingerprint Compatibility Table: Traverse and link table entries into a new table and combine compatible table and accumulate a match score.
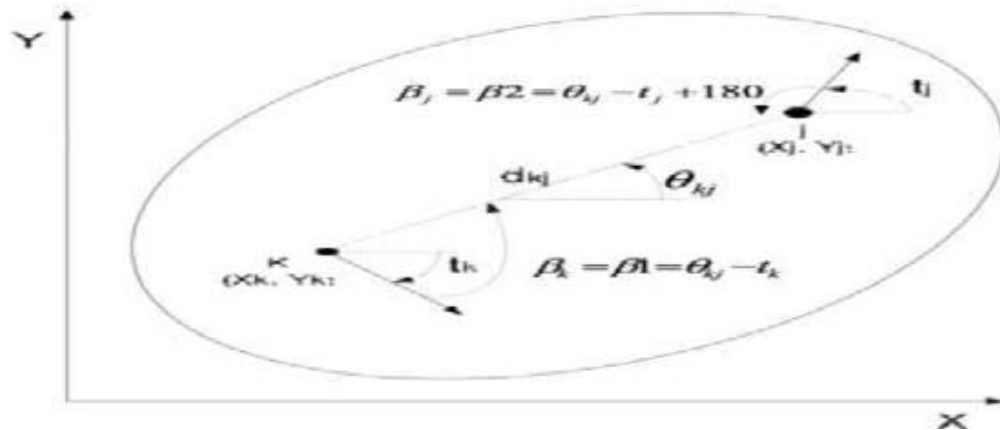
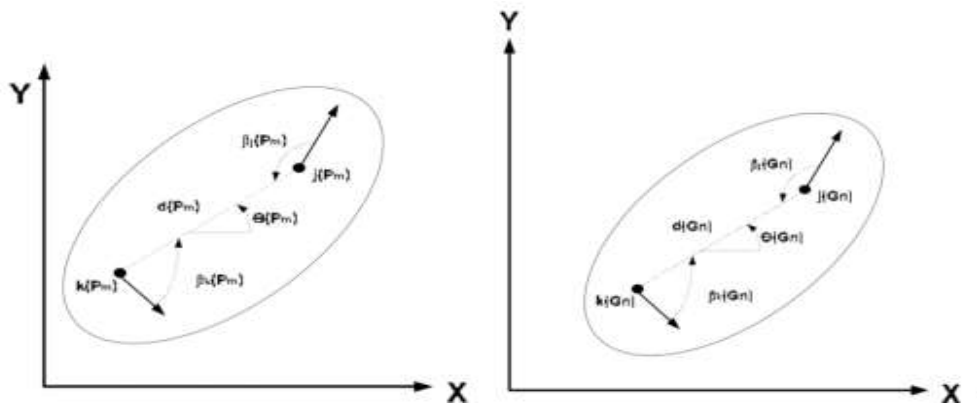Fig 4: Intra-Fingerprint Minutiae

Fig 5: Inter-Fingerprint Minutiae
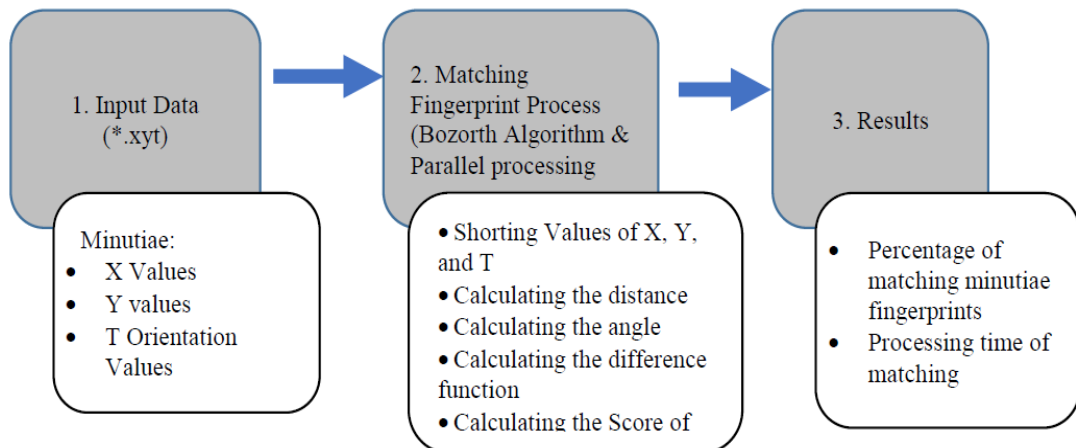
- **Finger Print Feature Matching:**

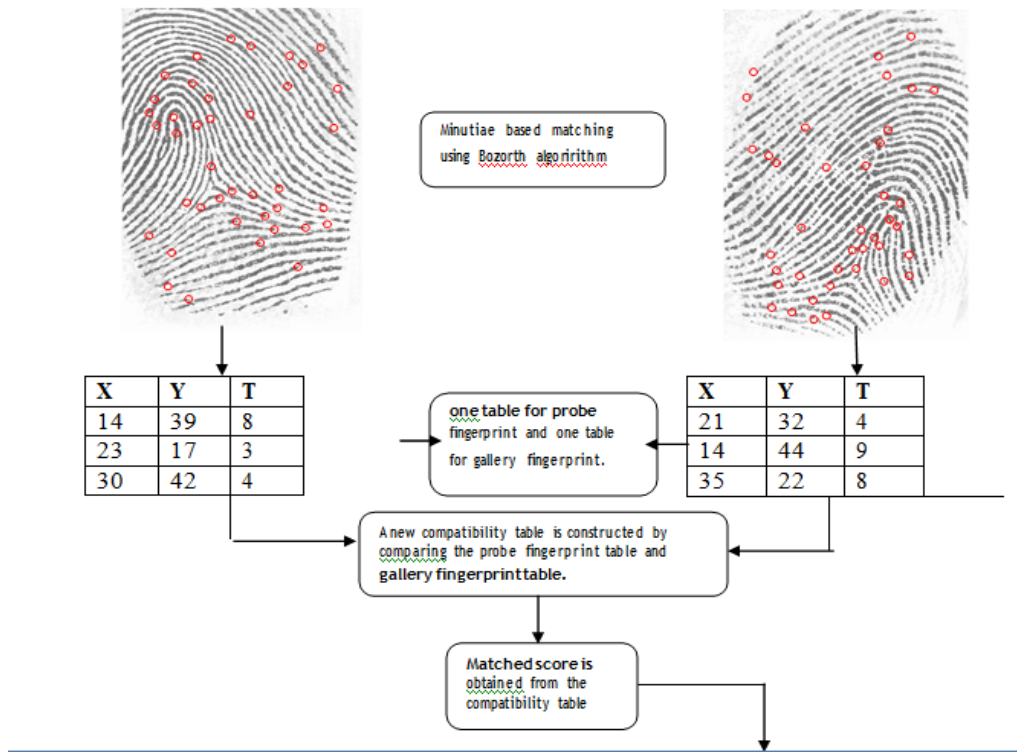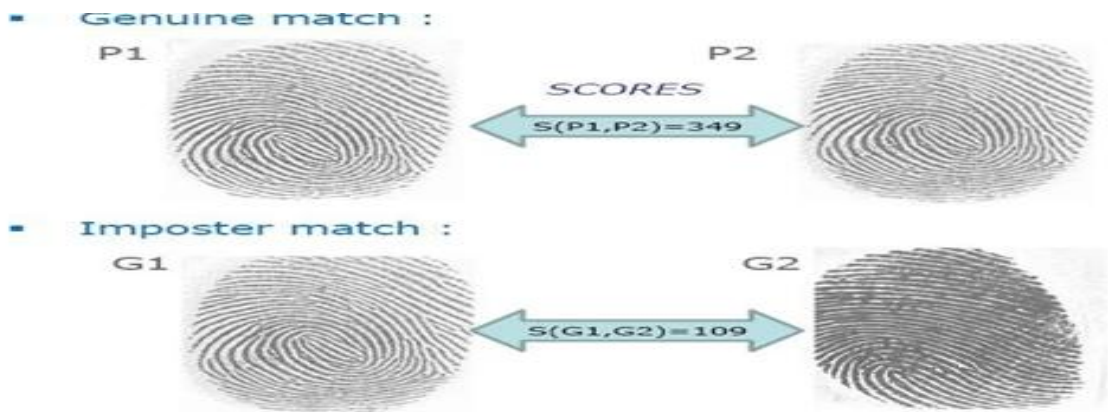Fig 6 :Feature Matching

Fig 7 : Matching score

Fig 8: Matched score

XIV.   USER INTERFACE

Fig 9 : Dashboard
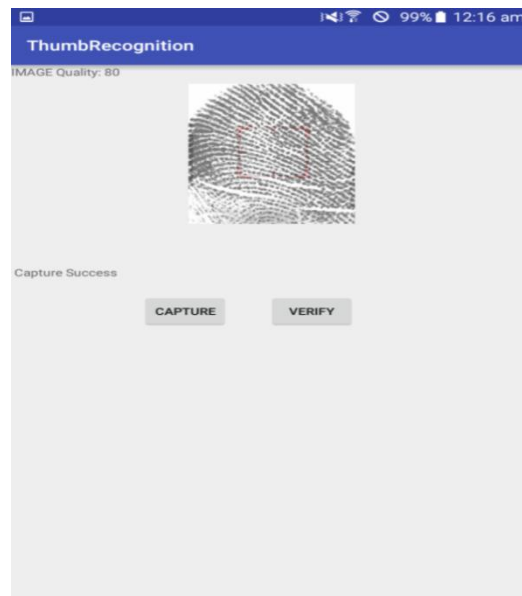

Fig 10: Login Page
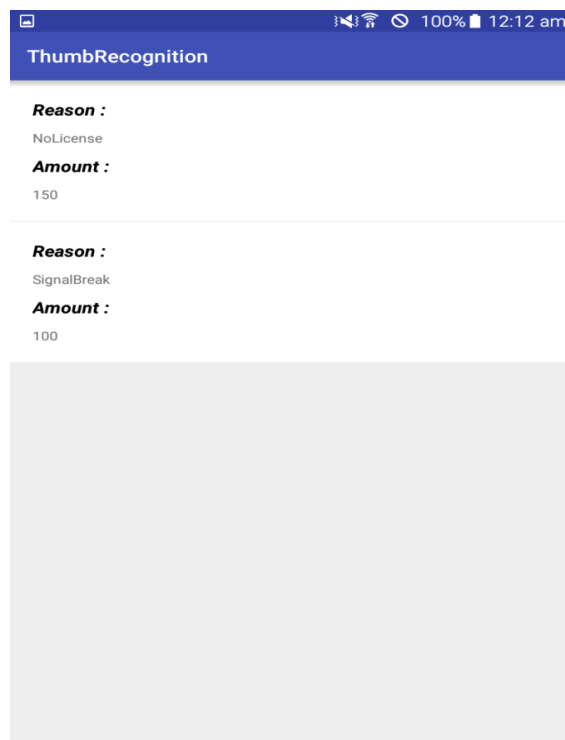
Fig 11: Thumb Impression Capturing

Fig 12: Fine Applied

XV CONCLUSION

The above implementation was an effort to understand how Fingerprint Recognition is used as a form of biometric to recognize identities of human beings. It includes all the stages from minutiae extraction from fingerprints to minutiae matching which generates a match score. Various standard techniques are used in the intermediate stages of processing. The traditional fingerprint recognition system takes more time for recognition because of pre processing and post processing steps of images and hence become impractical. We perform matching between mean fingerprint and other templates to show the capability of the system.

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