199_A Comparative Study on Fingerprint Matching Algorithms

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A Comparative Study on Fingerprint Matching Algorithms

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***Abstract*— fingerprints are studied and analyzed from a long duration of time and it has been identified that it has a vital role to play in the upcoming and future applications. However matching two fingerprints is quiet a complex process and can go wrong due to different reasons or problems in the method used for matching. In this project we are going to compare the various fingerprint matching algorithms. We are going to compare three matching techniques are direct matching, minutiae matching and matching based on Ratios of distance. We are going to test various datasets and identify which is the best out of the three algorithms that we are going to study based on various parameters such as cost, time complexity and accuracy.**

Keywords—Fingerprint, algorithms, minutae, fingerprint matching, complexity, parameters (key words)

I. INTRODUCTION

Biometrics have become a integral part of our life and used almost in each and every field today. From the biometrics, fingerprints are used in variety of applications both forensics and government applications. Also the fingerprint matching is the important and critical part in the study of fingerprints. The skin on our fingers consists of ridges and valleys. This ridges and valley pattern vary from person to person. This patterns are used to match the fingerprints. If the ridge-valley pattern of one finger matches the ridge-valley pattern of any other finger then the fingerprints are said to be matched, otherwise they are different from each other. The are various techniques and algorithms which have been evolved over the years for finding out the fingerprints are matched or not. But there is always a question to find out which is the best algorithms of the various evolved over the years. The parameters on which these algorithms are compared are cost, time complexity and accuracy to match the two fingerprints.

We are going to perform a comparative analysis of a three random algorithms in this project. The algorithms will be explained in detail ahead in this paper.

II. MORE ABOUT FINGERPRINTS.

A. *Ridges and valleys*

Ridges and valleys are the important components of fingerprint matching study. Ridges and valleys are present at the tip of fingers. The extreme points and the crossing points of the ridges are called minutae. Also the point at which the ridge bifurgates into two ridges is called as the bifurgation.

The minutae pattern of each fingerprint of a individual is different and does not change during his entire life. For matching of fingerprints a method called minutae based matching is widely accepted and we are going to compare the algorithms based on this method.

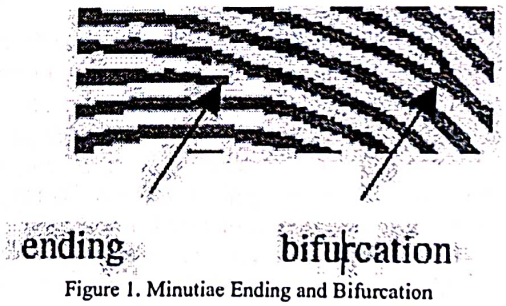

Figure 1. Minutiae Ending and Bifurcation

B. *Verification and identification*

In verification, the input is fingerprint query along with an identity (ID). The system verifies that whether the ID is acted in a same way with the fingerprint or not. Whereas in identification, the input is the fingerprint query which is compared with the existing database and then its determined that it is matching or not.

we are handling the verification problem. Although fingerprint recognition is research for over a period of time, and the progress done is also remarkable. The performance of