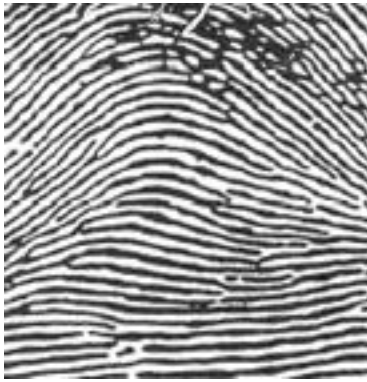


Characteristics of Fingerprints

- There are 3 general fingerprint distinctions:



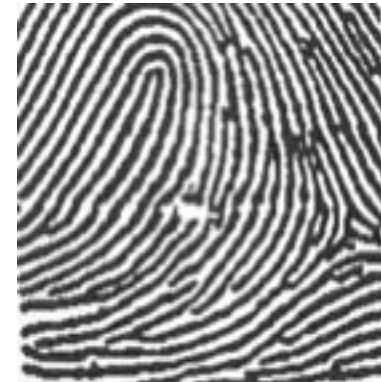
ARCH

About 5%



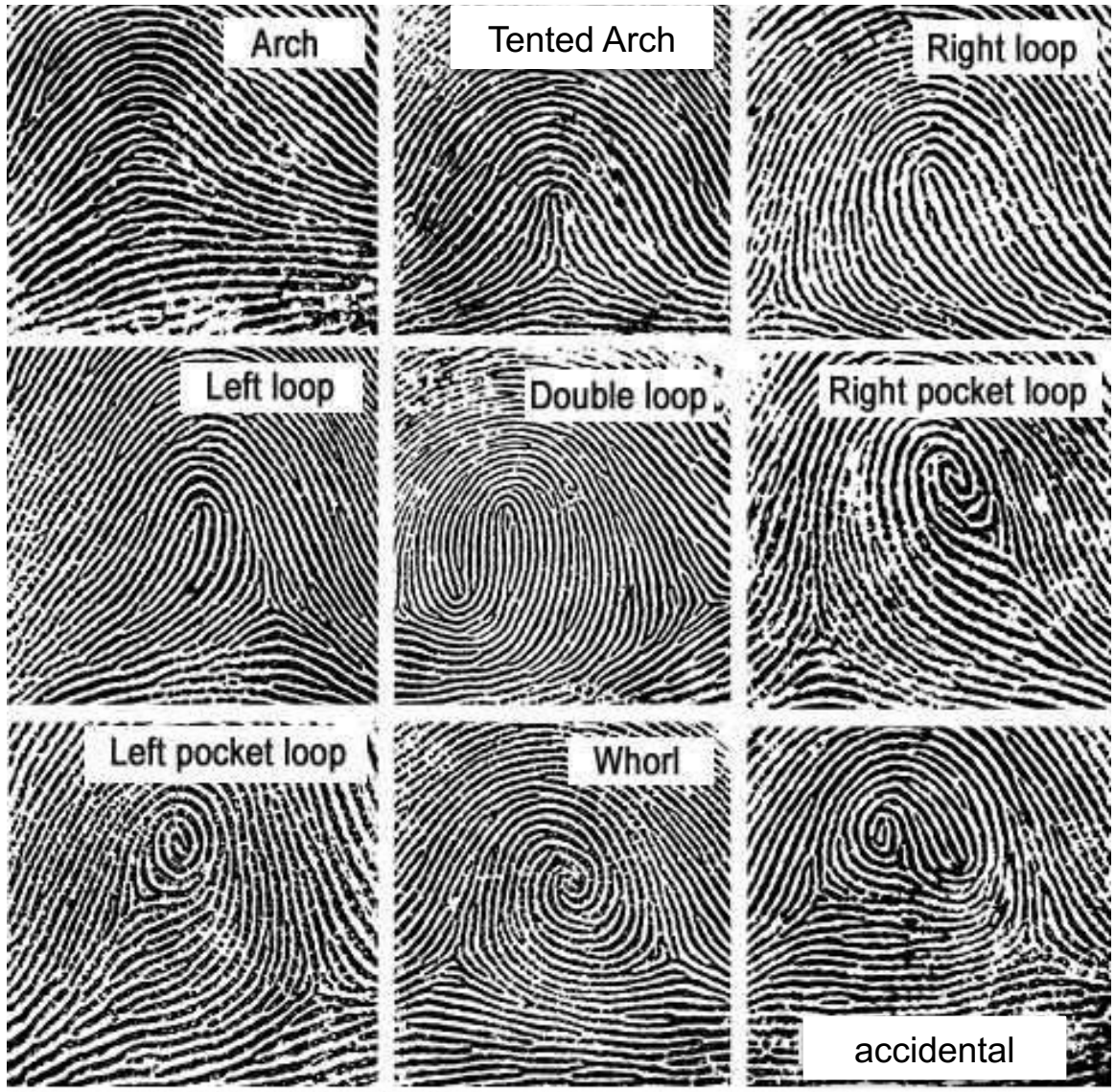
WHORL

About 30%
of the
population



LOOP

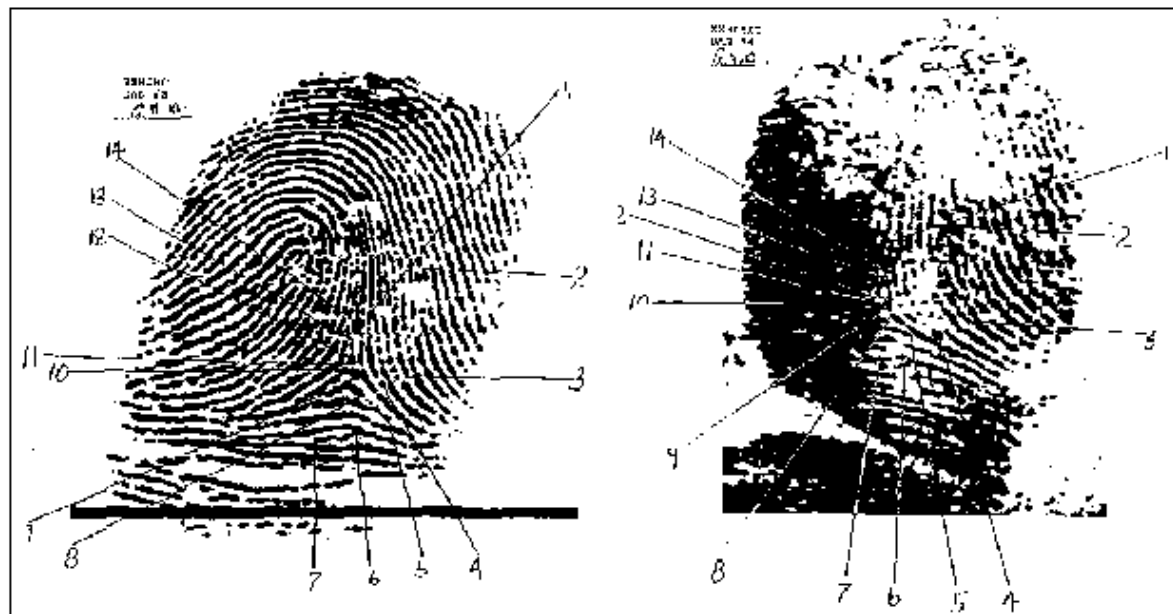
About 65%



Copyright: <http://www.FINGERPRINTS.TK>

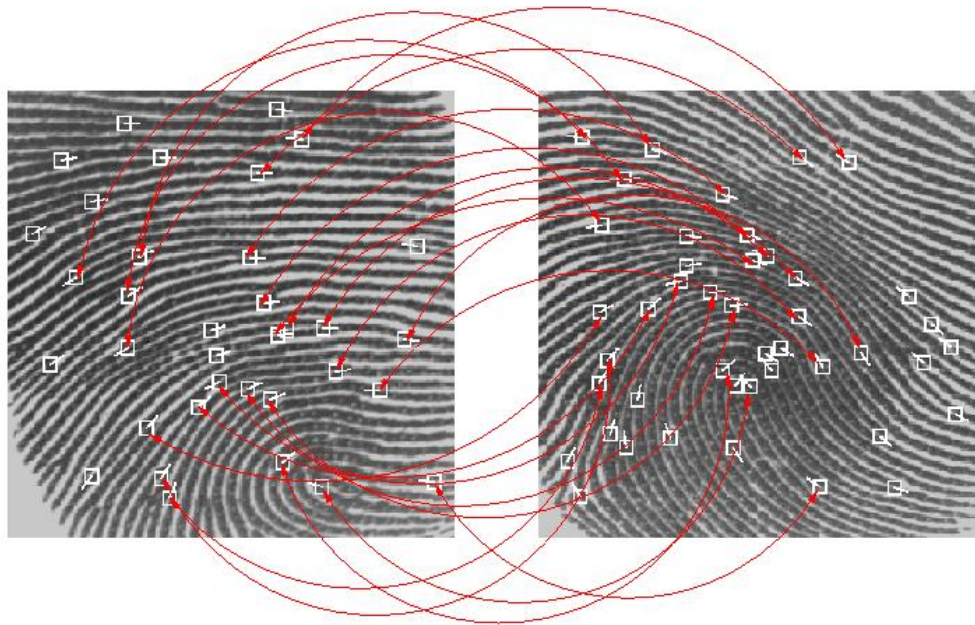
FINGERPRINT MINUTIAE PATTERNS

The individuality of any fingerprint is based not only upon the general shape or pattern it forms, but more importantly upon its ridge structure and specific characteristics.



“POINT by POINT”

An average fingerprint has 150 individual ridge characteristics.



“POINT by POINT”

There is **NO STANDARD** number

The **DECISION** is left

ENTIRELY to the examiner

-If between 10 to 16 specific points of reference for any two corresponding fingerprints identically compare, a match is assumed.

Automated Fingerprint Identification System (AFIS)

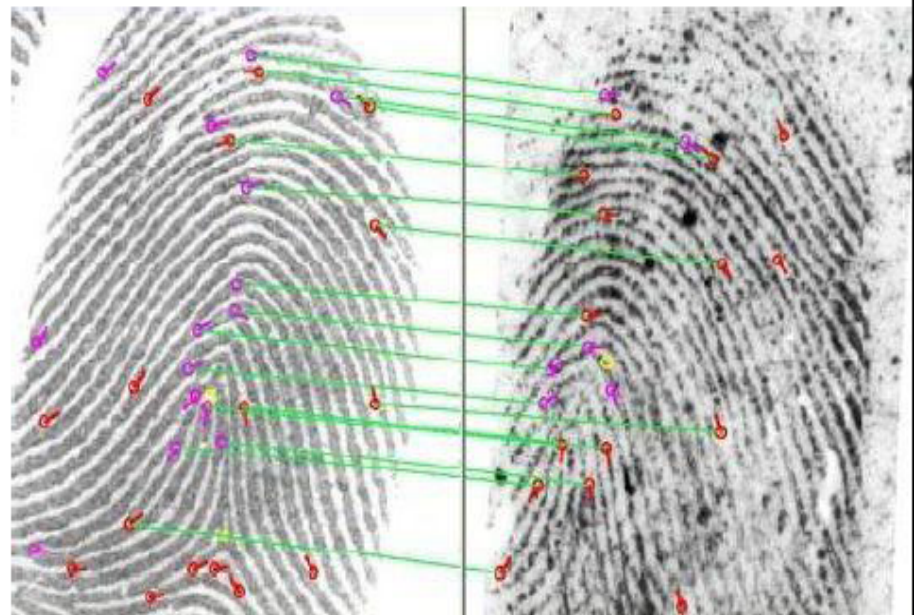
How it works:

- Computer scans and digitally encodes fingerprints
- Records the position and orientation of minutiae (ridge ending/ bifurcations/ etc.)
- Creates a geometric pattern
- Stores in a data base & allows 1000's of fingerprints to be compared per second via computer



Comparison of unknown prints in AFIS

- AFIS ranks known prints from files to unknown print
- An expert compares to determine if there's a match.
- Criminal courts consider 12 points a "match" for prints.



Known print on file

Unknown print

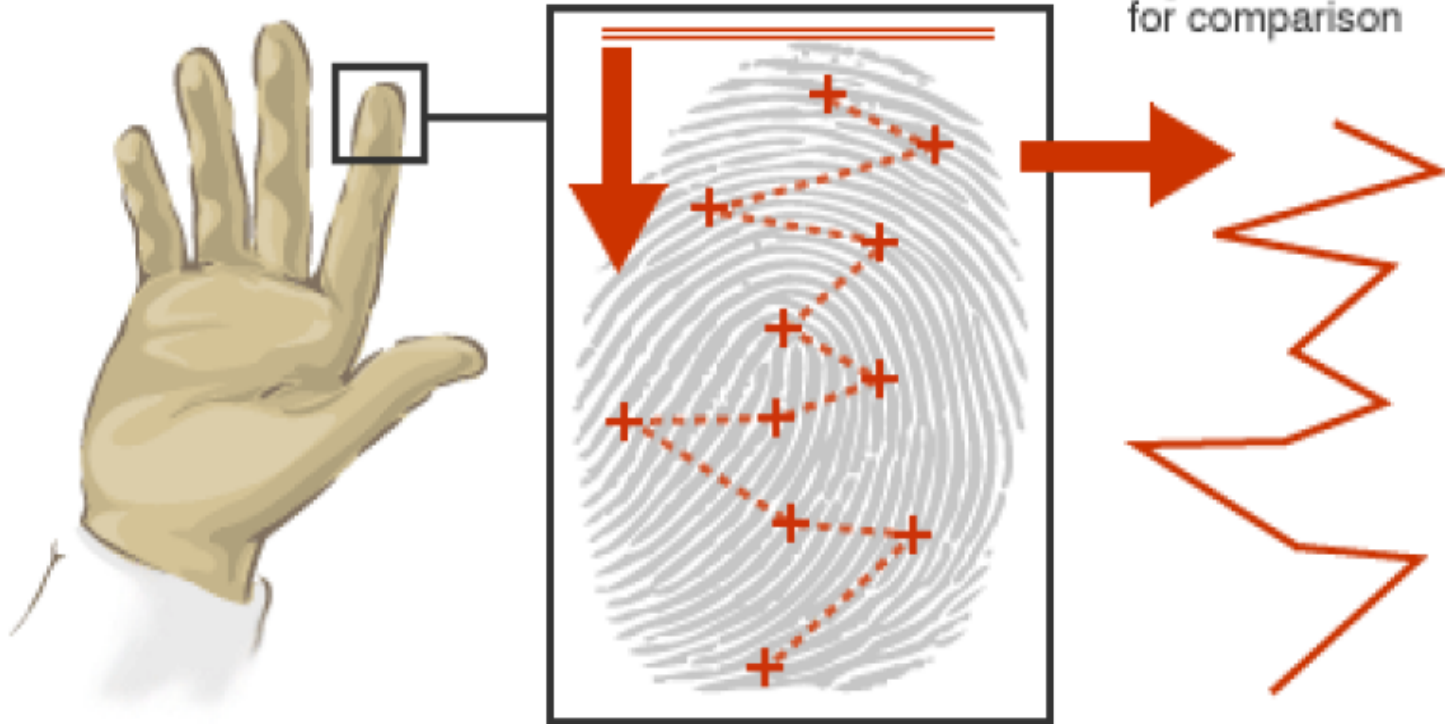
iPhone (and other) FINGERPRINT RECOGNITION

HOW FINGERPRINT SCANNERS RECORD IDENTITIES

① Individual's index finger is pressed onto scanner

② Scanner reads unique pattern plotting specific distinctions (minutiae)

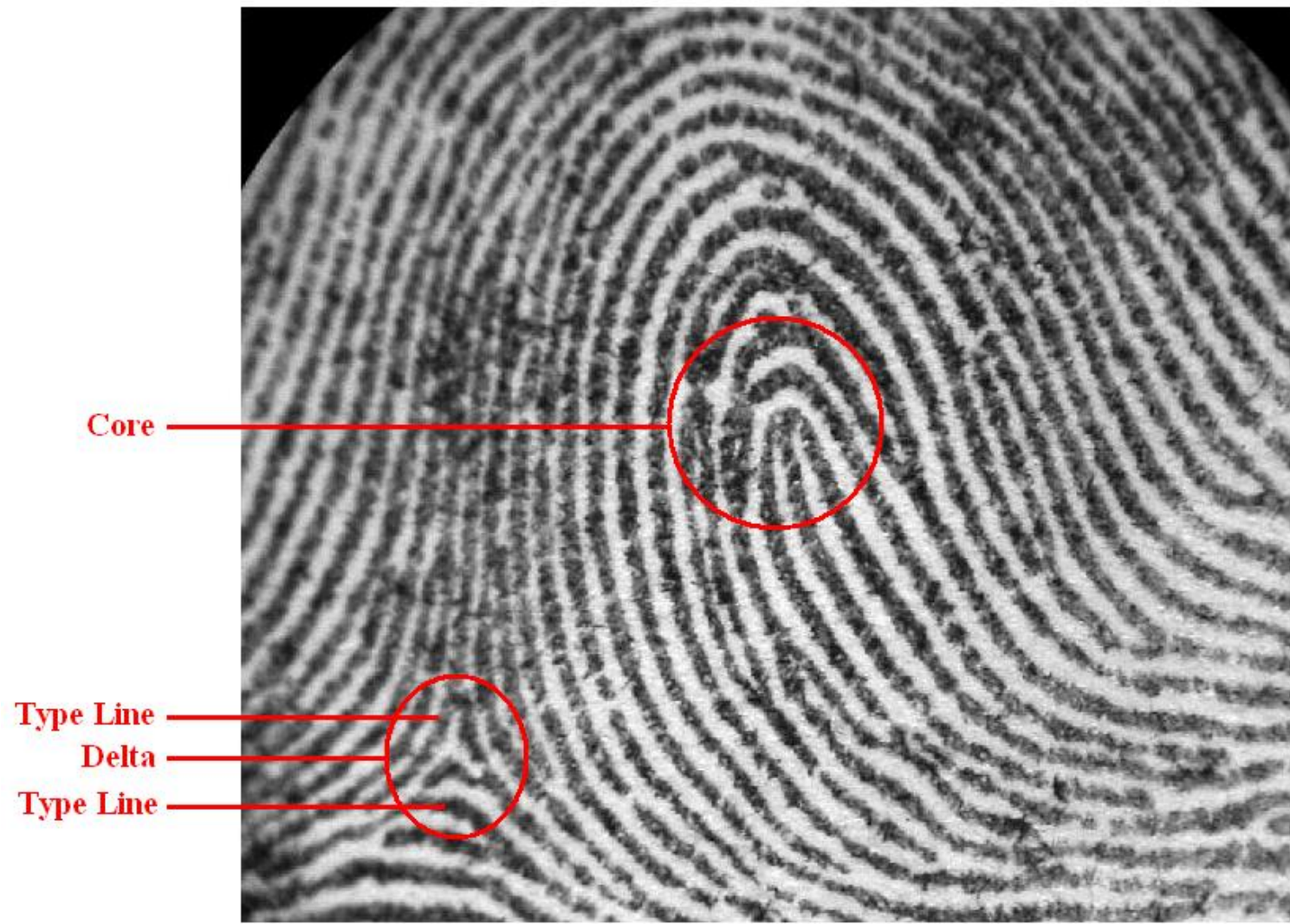
③ Points are linked forming a pattern recorded as an algorithm used for comparison



Characteristics of Fingerprints

- Forensic examiners look for
 - **Core**
(the center of a whorl or loop)
 - **Deltas**
(triangular regions near a loop)
- **Ridge count**
 - Counting from the core to the edge of the delta
 - Distinguishes one fingerprint from another





Core

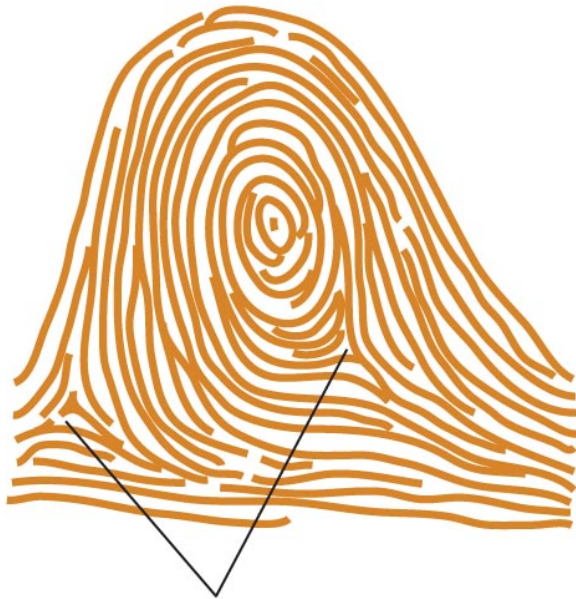
Type Line

Delta

Type Line

Characteristics of Fingerprints

Central pocket loop whorl



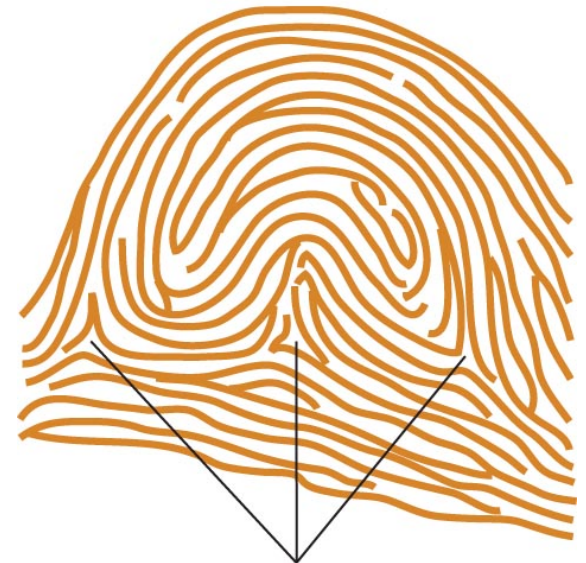
Deltas

Double loop whorl













Deltas

Accidental whorl

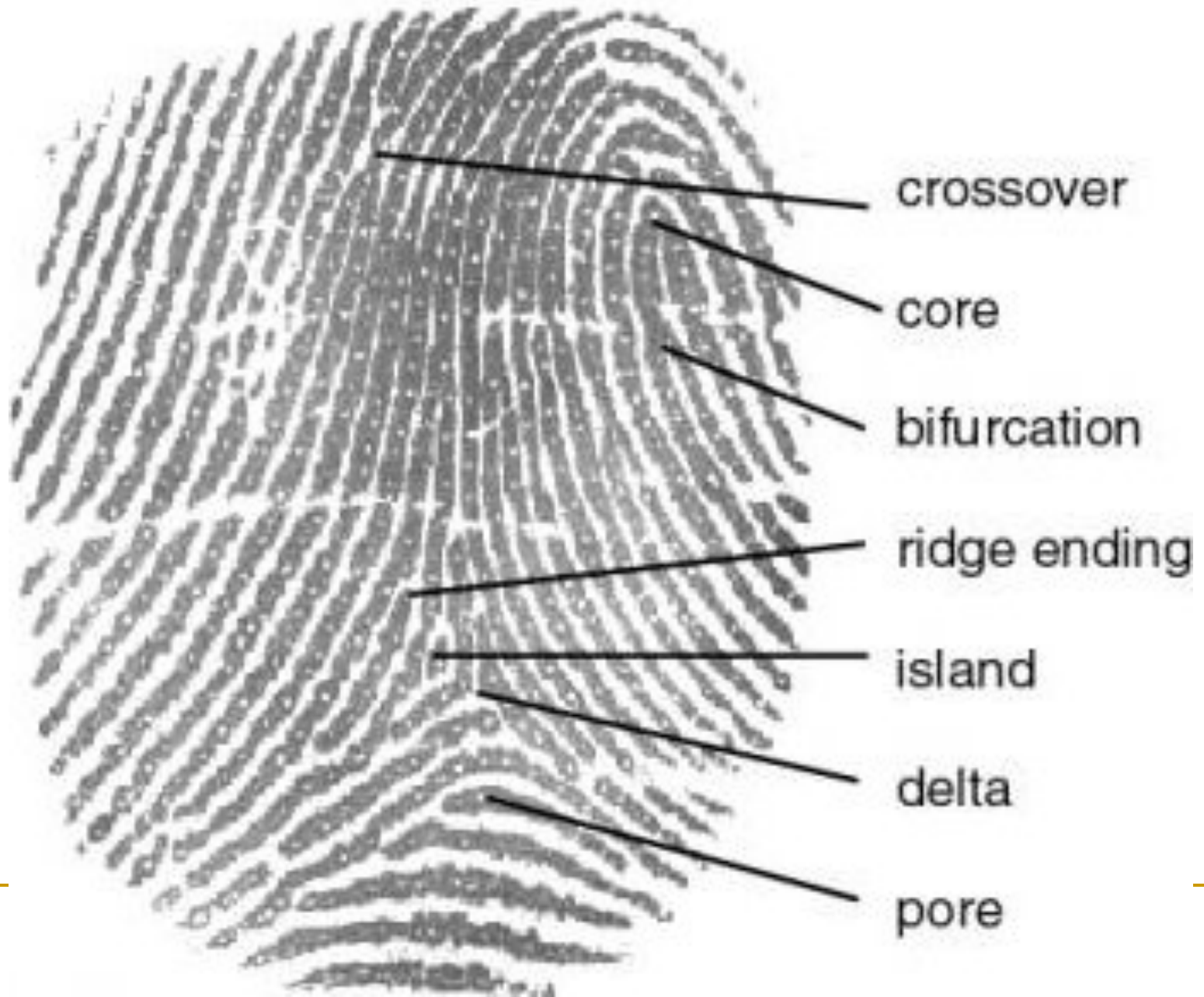


Deltas

Fingerprint Minutiae Patterns

Name	Visual Appearance
1. Ending ridge (including broken ridge)	1. 
2. Fork (or bifurcation)	2. 
3. Island ridge (or short ridge)	3. 
4. Dot (of very short ridge)	4. 
5. Bridge	5. 
6. Spur (or hook)	6. 
7. Eye (enclosure or island)	7. 
8. Double bifurcation	8. 
9. Delta	9. 
10. Trifurcation	10. 

RIDGE CHARACTERISTICS - MINUTIAE



Most adults have 150 identification marks on each finger

