



Fingerprint Analysis

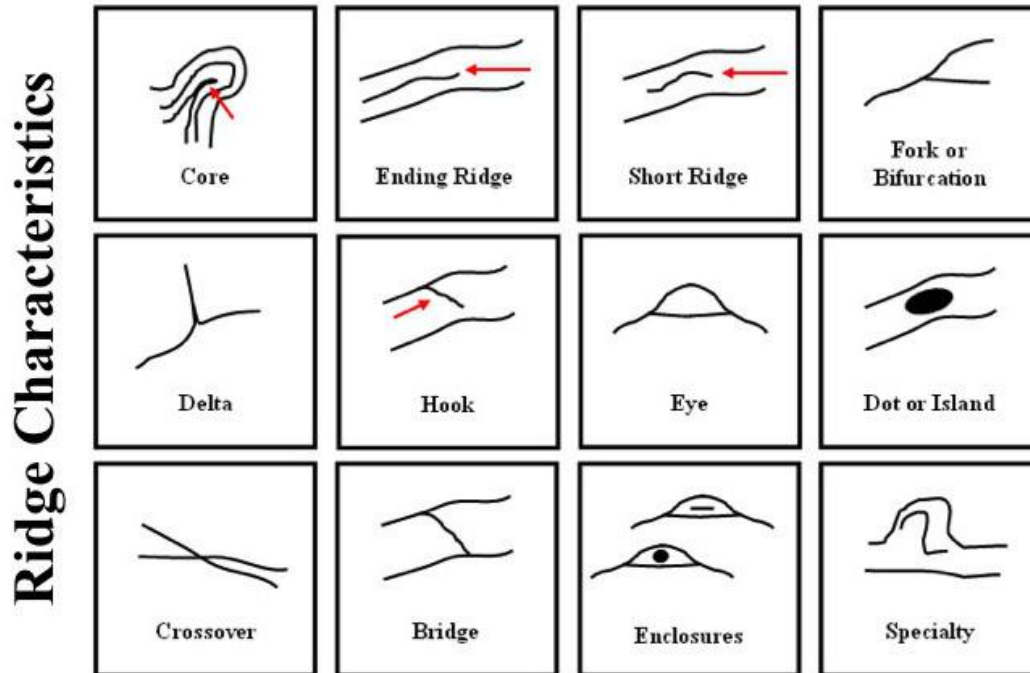
**How do fingerprint
scanners work?**

Part 4



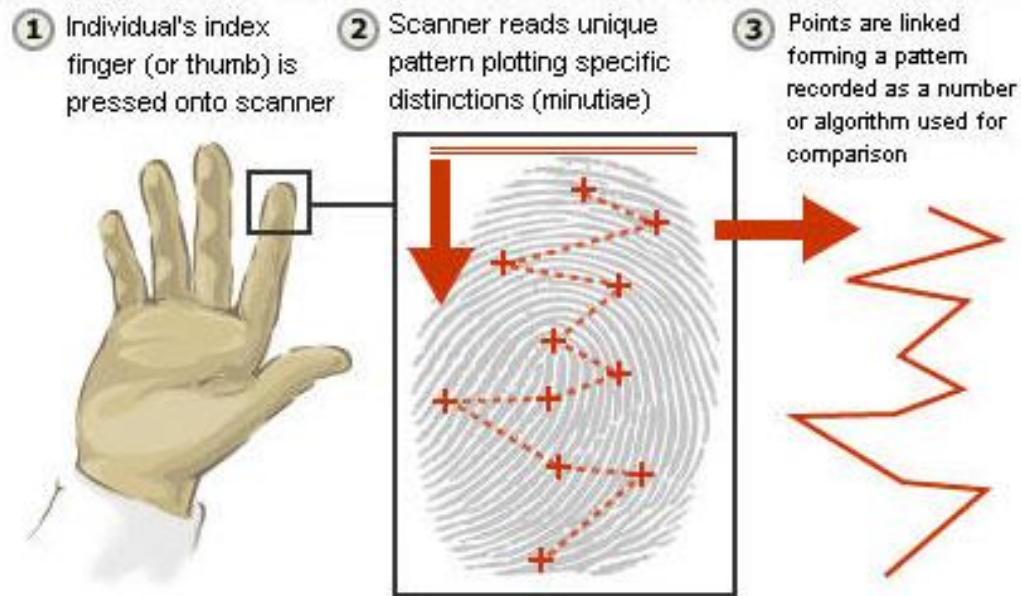
In movies and TV shows, automated fingerprint analysers typically overlay various fingerprint images to find a match. In actuality, this isn't a particularly practical way to compare fingerprints.

Smudging can make two images of the same print look pretty different, so we are rarely going to get a perfect image overlay. Additionally, using the entire fingerprint image in comparative analysis uses a lot of processing power, and it also makes it easier for somebody to steal the print data.



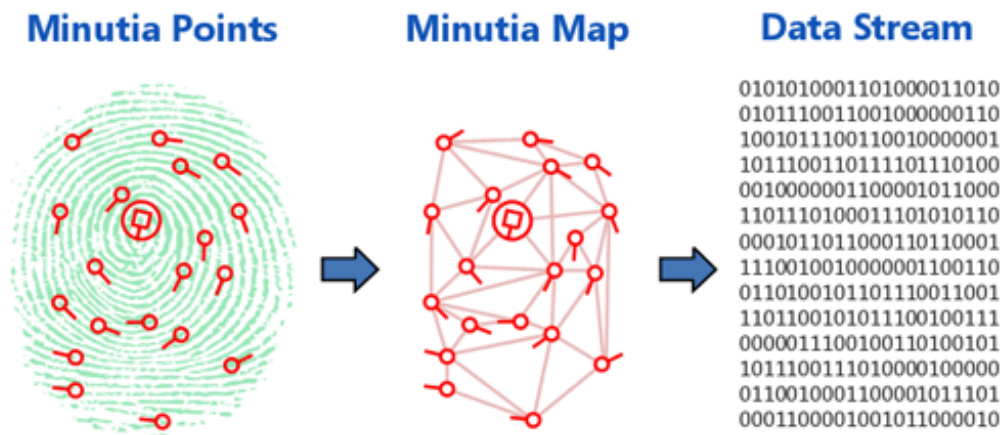
Instead, most fingerprint scanner systems compare specific features of the fingerprint, generally known as **minutiae**.

Typically, human and computer investigators concentrate on points where ridge lines end or where one ridge splits into two (**bifurcations**). Collectively, these and other distinctive features are sometimes called **typica**.

HOW POLICE AND SCHOOL FINGERPRINT SCANNERS RECORD IDENTITIES

The scanner system software uses highly complex algorithms to recognise and analyse these minutiae.

The basic idea is to measure the relative positions of minutiae, in the same sort of way we might recognize a part of the sky by the relative positions of stars. A simple way to think of it is to consider the shapes that various minutia form when you draw straight lines between them.



If two prints have three ridge endings and two bifurcations, forming the same shape with the same dimensions, there's a high likelihood they're from the same print.

To get a match, the scanner system doesn't have to find the entire pattern of minutiae both in the sample and in the print on record, it simply has to find a sufficient number of minutiae patterns that the two prints have in common. The exact number varies according to the scanner programming.



How do fingerprint scanners work?

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Source –

"How Fingerprint Scanners Work" by
Tom Harris on **HowStuffWorks.com**



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