NSP
Powering Trusted & Connected World

Fingerprint Identification System

Identifing criminals using Universal Criminal Workstation

Biometric Workstation for Identification, Records & Match

Overview:

The two-underlying premises of fingerprint identification are uniqueness and permanence. Human fingerprints are detailed, unique, difficult to alter, and durable, making them ideal for marking human identity. Matching two fingerprints is one of the widely used reliable biometric techniques and needs an expert computer system operating under threshold scoring rules, to determine they are likely to have originated from the same finger or palm.

The fingerprint identification systems consist of the capturing, processing, and storing of the fingerprint image then comparing the print with the fingerprint repository and obtaining/ storing/ displaying comparison results.

Exemplar prints or known prints (prints deliberately collected for a subject for enrolment or identification) are collected either as live scans using scanners or on paper cards using ink.

The image acquisition is accomplished using fingerprint scanners by measuring the physical difference between ridges and valleys to identify the fingerprint pattern. This live scan image is digitally processed to create a biometric template (a collection of extracted features) and the captured image is then processed using digital image processing techniques to be stored in a database.

The fingerprint matching technique uses minutiae, or ridge characteristics, to identify specific points on an example print and tries to find a matching print in the database with the same information/ pattern.

Use case

A government law enforcement agency used the program “Criminal Workstation” that housed a huge database of fingerprints and other details of known criminals. The fingerprint identification system consisted of a fingerprint scanner and an image processing application. The fingerprint was collected either using the scanner or collected on the paper card using ink and scanned later. These prints were processed and stored in the database. Stored images were later compared and identified against a large number of prints in the master repository. This resulted in the following three scenarios

1. Match was found in civil records
2. Match was found in the criminal database
3. No match was found.

On finding a match in the criminal database the criminal is identified

Industry:

Law enforcement agencys

Challenges

The system in use had the following issues

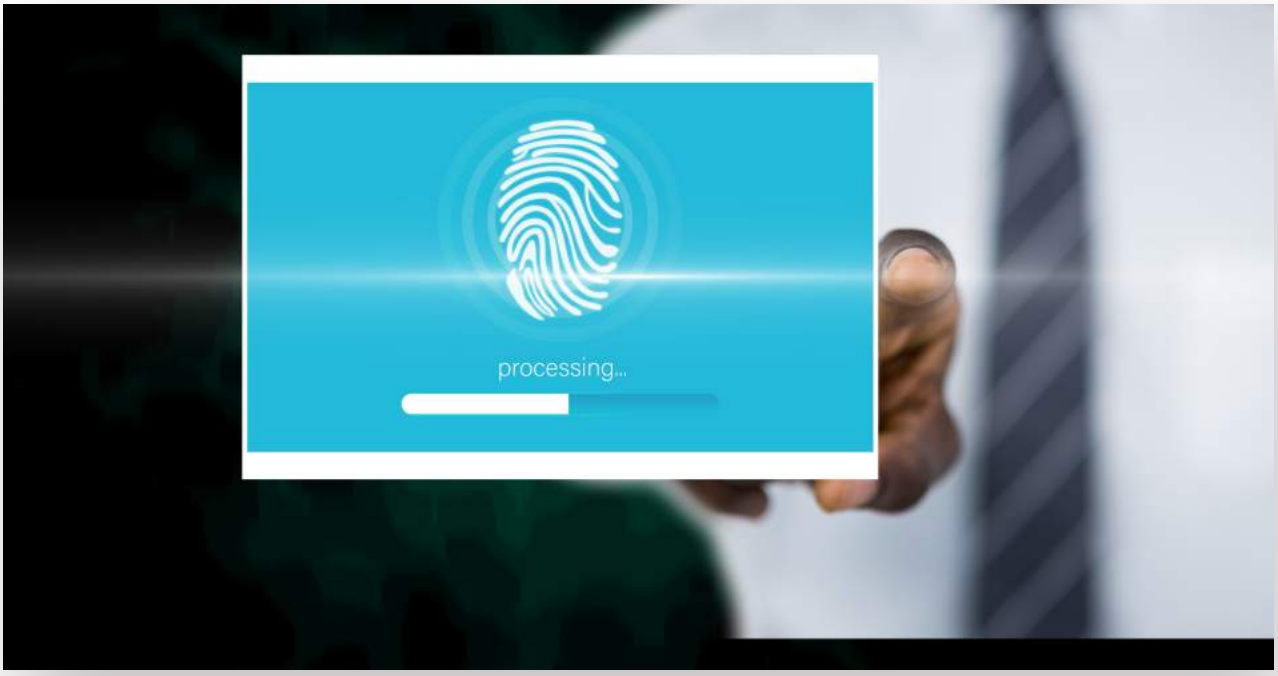
1. The end-user required training to operate it, and the user interface was not intuitive.
2. It could not be run on any client
3. Handling paper-based fingerprint capture was difficult if smudged
4. For proper identification and matching complete print was necessary

As a result, the workflow was not smooth and resulted in backlogs and waiting.

Solution

A comprehensive cross-platform desktop React application was built on the Electron architecture framework, with the following advantages:

1. The flexibility of being able to run on any client.
2. New intuitive UI/UX based on design thinking principles was designed and implemented.
3. An improved image capturing capability with the ability to match finger prints using a portion of the captured image.



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