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**Fighting Identity Theft with
Advances in Fingerprint
Recognition**

Dick Mathekga

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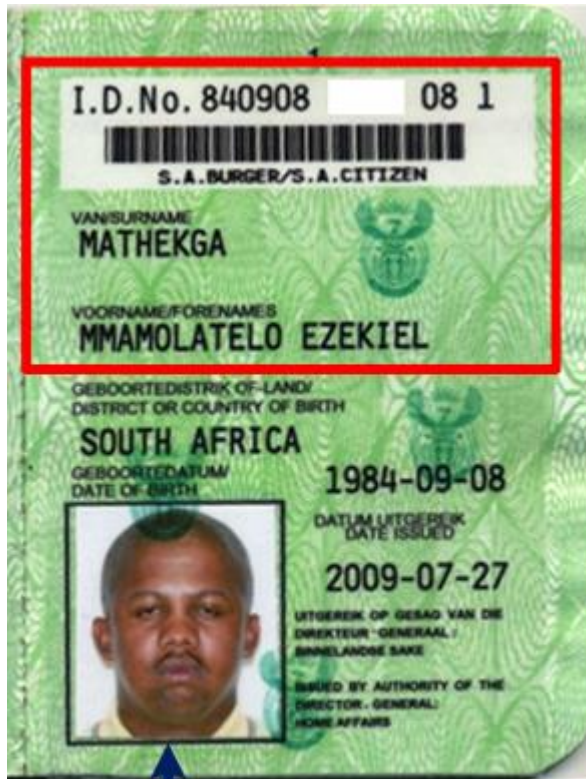
Outline

- Identity theft is ...
- Made possible by ... and ...
- Can be solved through ...
- Biometric recognition against a central database is such a method
- Adoption of technology is slow
- Software description
- Software performance

Identity theft is ...

... when **person a** assumes the identity of **person b**, using identifying information of **person b**; usually to:

- gain access to privileges available to **person b**
- commit a crime and not have it linked back to them.



person a



person b

Made possible by ...

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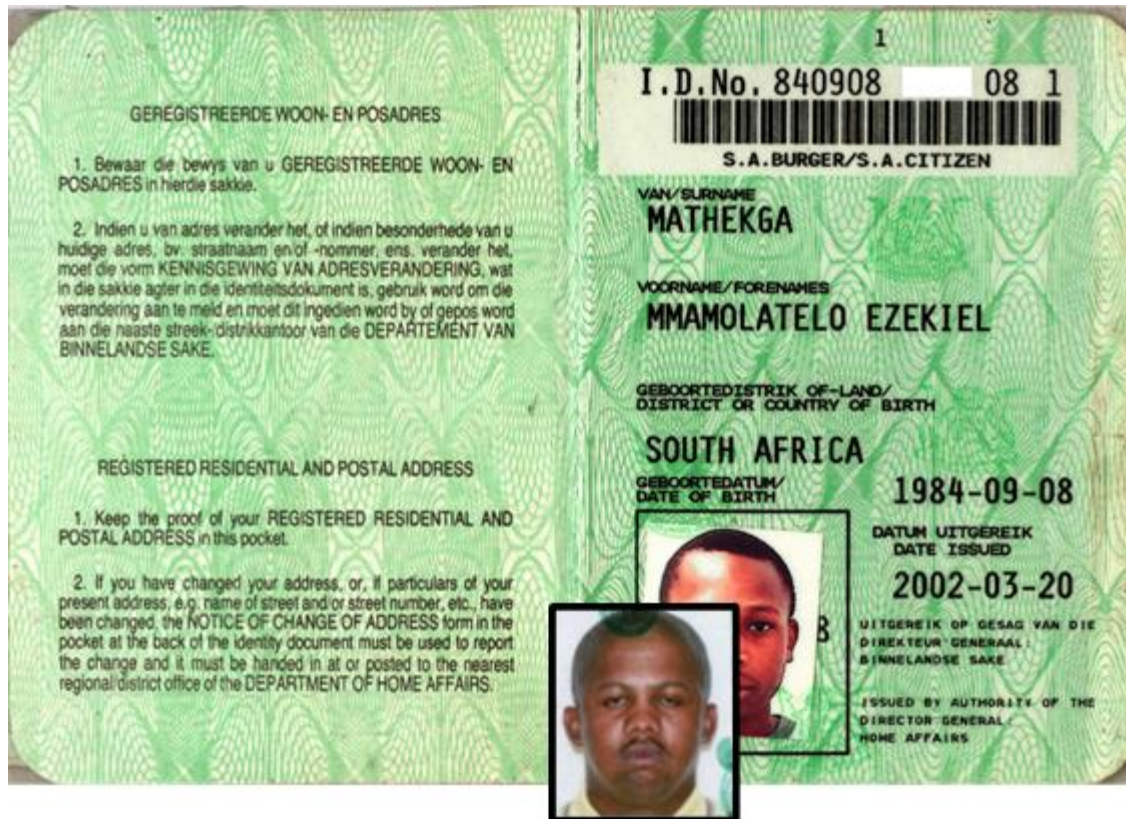


Full Names
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... and ...



Can be solved through ...

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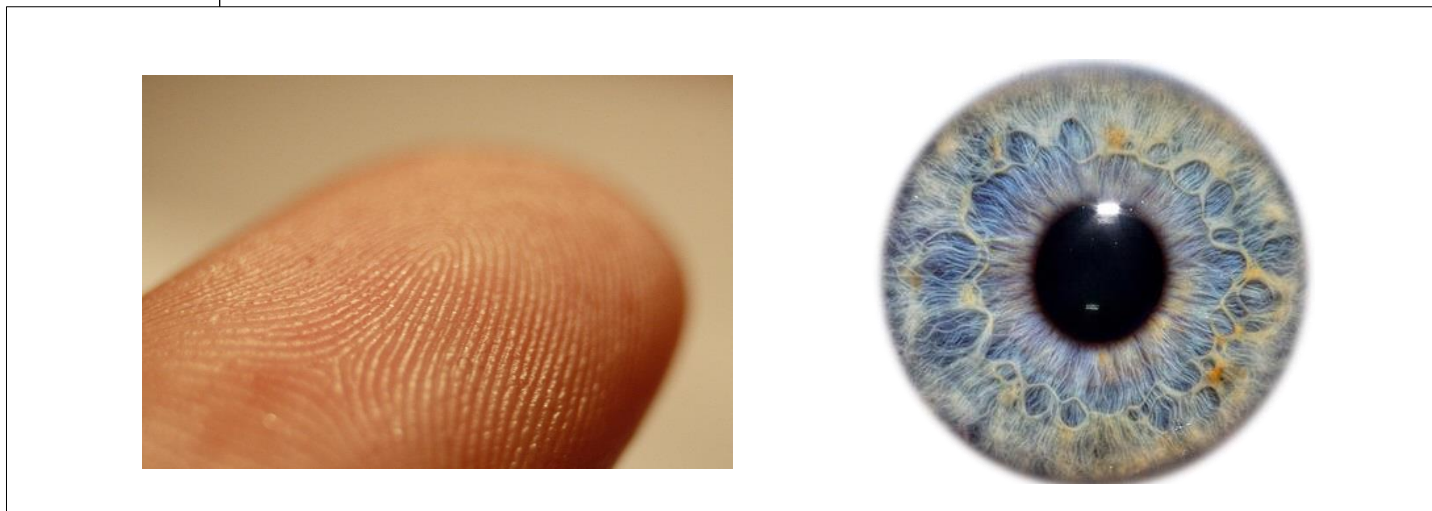
... a more reliable method of **confirming** identity.



Biometric recognition against a central database is such a method

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Use of a biometric to automatically determine or confirm an identity



Adoption of technology is slow

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Hardware



Software



Software description

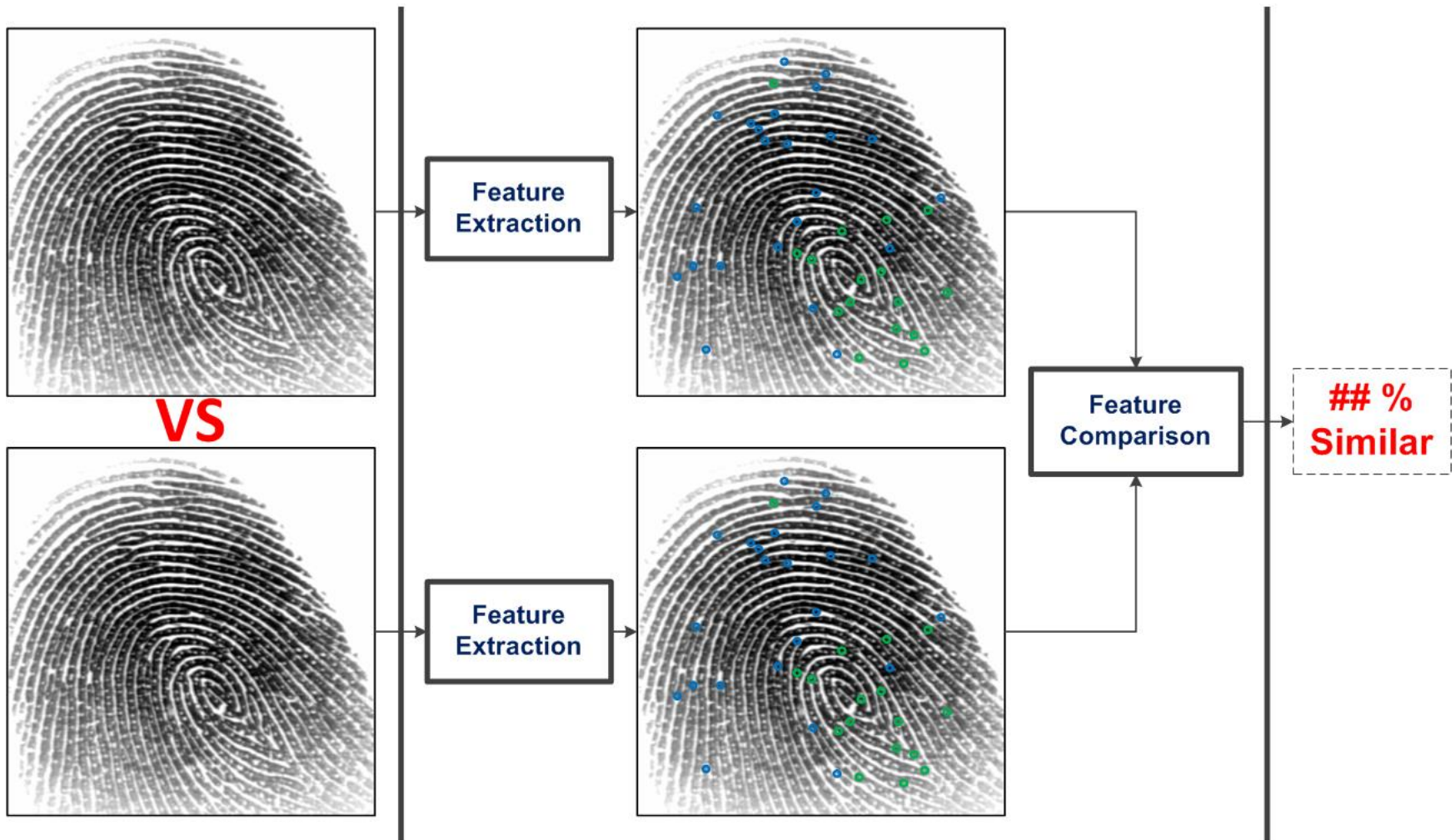
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Software library with functions needed to perform biometric recognition using fingerprints; including the following core functions:

- fingerprint feature extraction
- fingerprint feature comparison
- fingerprint classification

Software description (cont ...)



Software description (*cont...*)

There are 5 different types of **fingerprint patterns** and thus 5 **fingerprint classes**.



Whorl



Tented Arch



Left Loop



Right Loop



Plain Arch

Feature extraction

- fingerprint features can be extracted from quality fingerprints.
- not all features are always extracted or extracted correctly.
- overall performance is below that of most commercial software and were making improvements.



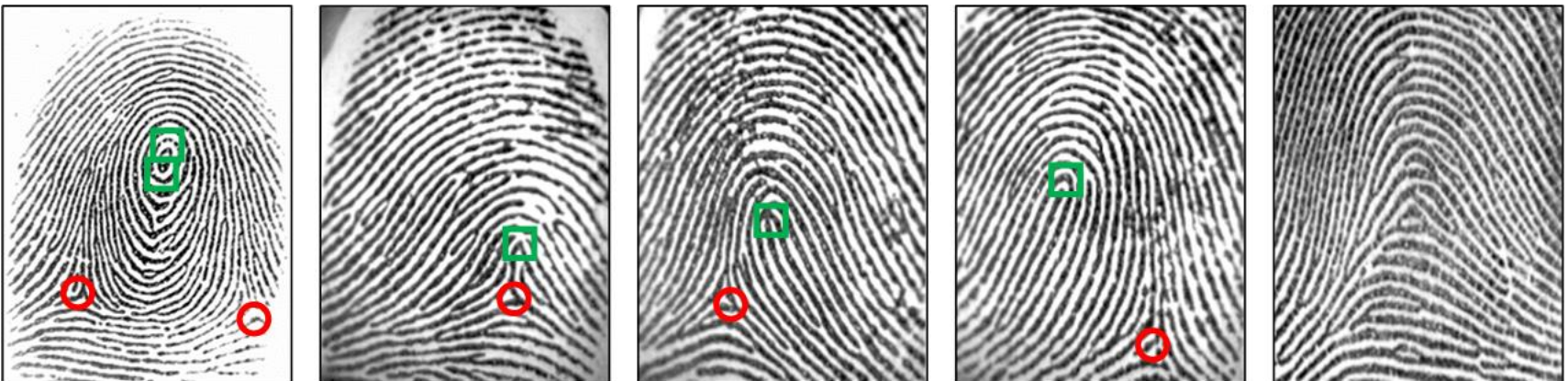


Feature comparison

- ❑ matching features from different fingerprints can be identified
- ❑ performance of our similarity score formula compare favourably with those in the published literature
- ❑ overall performance still below that of best commercial products

Fingerprint classification

- ❑ we have obtained classification accuracies of over 90% classifying fingerprints in Database 1 of the 2002 and 2004 fingerprint verification competitions
- ❑ accurate location of singular point remains a challenge; especially for poor quality fingerprints



Summary

- Identity theft was defined and one of its many consequences mentioned
- The reasons why identity theft is possible were presented.
- A solution to the problem of identity theft was discussed.
- A hindrance to the realisation of the solution was presented.
- CSIR's contribution to the realisation of the solution is discussed.

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Thank you

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