

A COMPARATIVE STUDY OF FINGERPRINT MATCHING TECHNIQUES

Chapter 5 – Conclusion and Recommendations



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# Conclusion

The two algorithms, Scale Invariant Feature Transformation (SIFT) and Minutiae-based algorithm can be implemented using the Python Programming language.

Both algorithms are able to extract unique features on sample data. These unique features can be used to match one fingerprint to another.

The processes can be visualized in a Graphical User Interface using the PyQt5 library and their performance including runtime collected.

Scale Invariant Feature Transformation (SIFT) is more likely to accurately identify subjects with (some sort of distortion on their fingerprints) such as cuts, dust or skin-oil on the fingerprint or on the scanner. Minutiae is less likely to identify subjects with distortions or aberrations on their fingerprints.

Minutiae based algorithm will run faster on larger datasets as compared to SIFT, however its accuracy is reduced.

Both algorithms have good performance, running under 3 milli seconds on a database containing 500,000 sample fingerprint images.

# Recommendations and Future Work

* Both algorithms should be reimplemented in the latest version of python and the accompanying libraries as they can offer significant improvement to runtime
* Larger data sets should be used to validate the efficiency of each algorithm as the size of a dataset increases
* The criteria for the match scores should be varied to investigate/confirm the efficiency of the algorithms