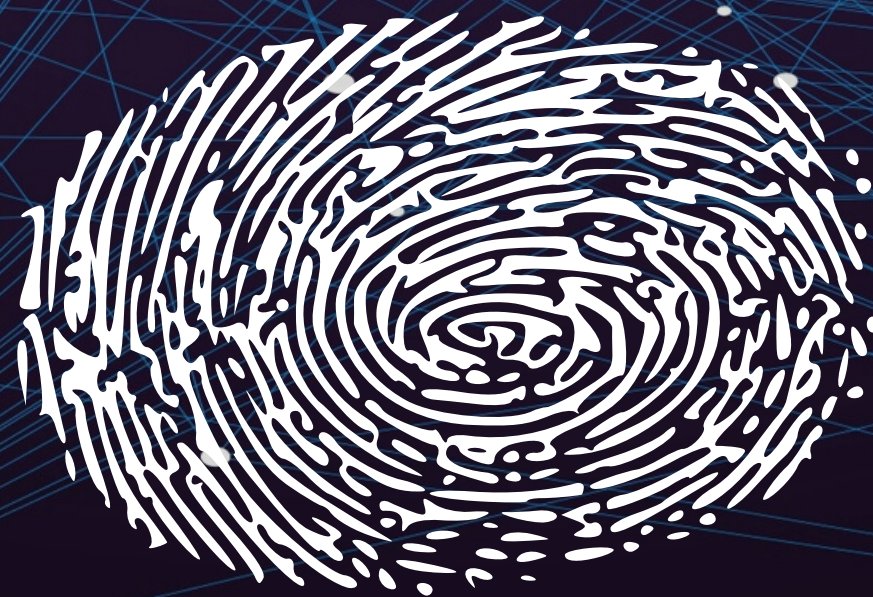


FINGERPRINT FEATURE IDENTIFICATION

PYTHON PROGRAM TO COMPARE THE
FEATURES BETWEEN 2 FINGERPRINT IMAGES



INTRODUCTION:

Our project is based on fingerprints, which is inspired from forensic science. Fingerprint applications can be useful for various security and identification purposes. when it is used in the right way, it makes our lives easier and more convenient.



PROBLEM :

Every fingerprint is unique hence it helps in solving problems like in government, commercial and forensic related services in our lifestyle.

An approach we use for fingerprint image analysis is to find the criminal records and help investigators solve the crime in forensics.



Limitations :

But sometimes, the computer errors or insufficient information might cause problems in the analysis.

And also due to the privacy and security concerns, it will be difficult to obtain fingerprint data of humans or criminals.

PROPOSED APPROACHES :

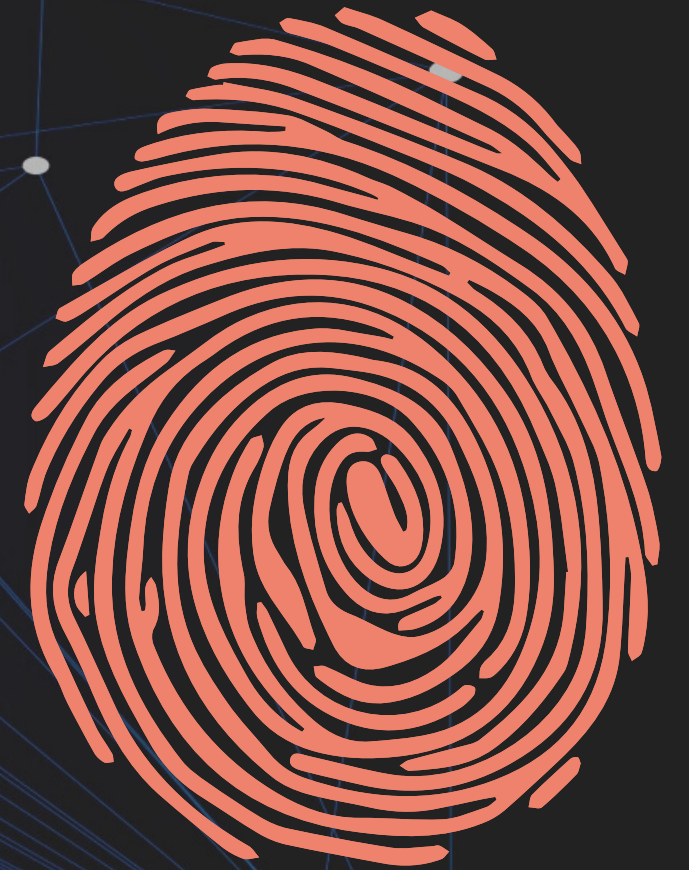
We are using feature extraction in our project and in will detect every small feature from a fingerprint image.

This will also solve the problems caused by human errors and avoid natural factors in between the analysis.

PROPOSED APPROACHES :

Project with the idea of fingerprint identification by identifying the several features of the fingerprint in the image form. We used python language for the project and made the program by using libraries mainly OpenCV, numpy, pandas, Matplotlib. For the data, we used 2 fingerprint images saved in a file from the internet.

We couldn't use any real database from the internet or websites because of security and privacy reasons.



IMPLEMENTATION DETAILS :

ALGORITHM :

ORB: Oriented fast & Rotated Brief. It is a part of OpenCV and is mostly used for computer vision related programs.

(Feature Based Algorithms):

1.SIFT: Scale Invariant Feature Transform.

2.BF matcher: Brute Force matcher.

3.FLANN: Fast library for approximate nearest neighbors.

PROCESS :

1.Constructing a scale space so that the features are scale independent.

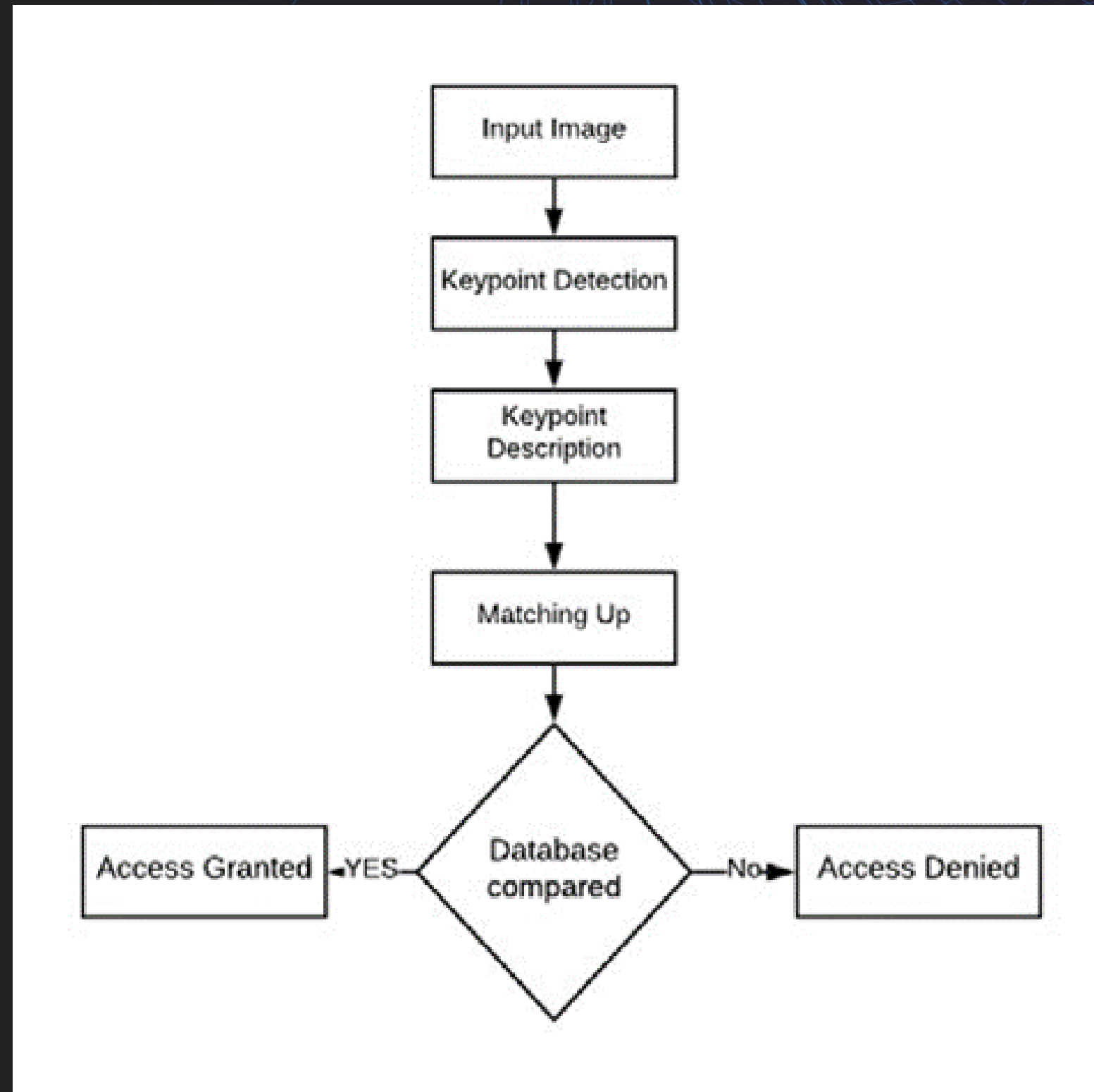
2.Key point localization to identify the key points.

3.Ensuring that key points are rotation invariant.

4.Description for each key point.

IMPLEMENTATION DETAILS :

ALGORITHM DIAGRAM

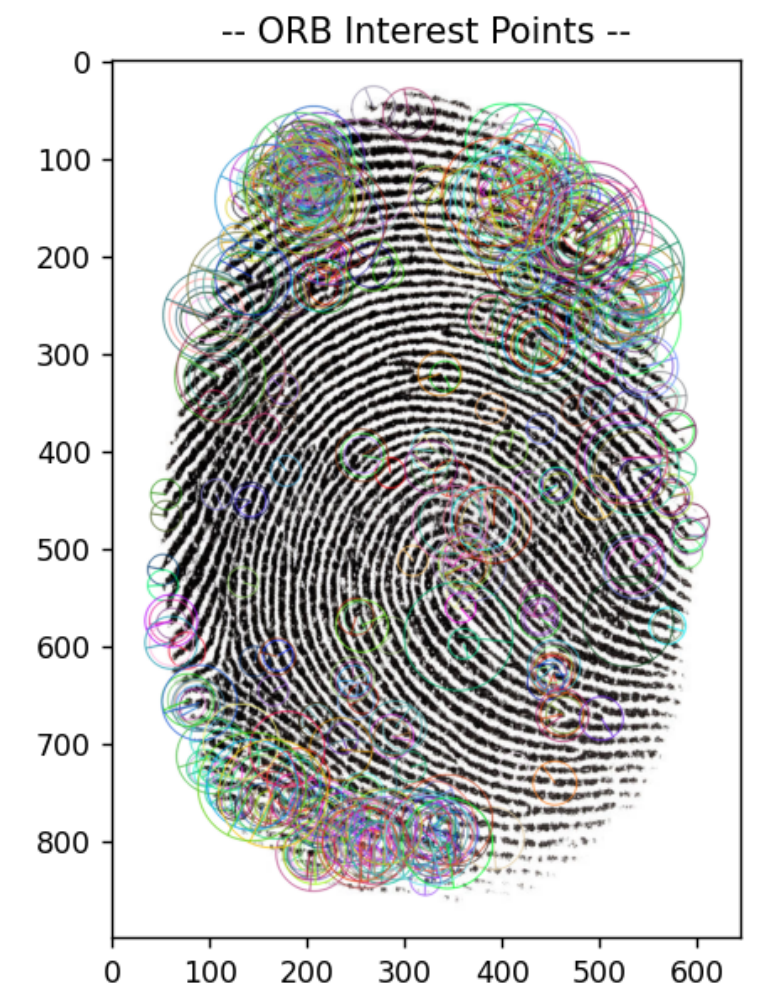
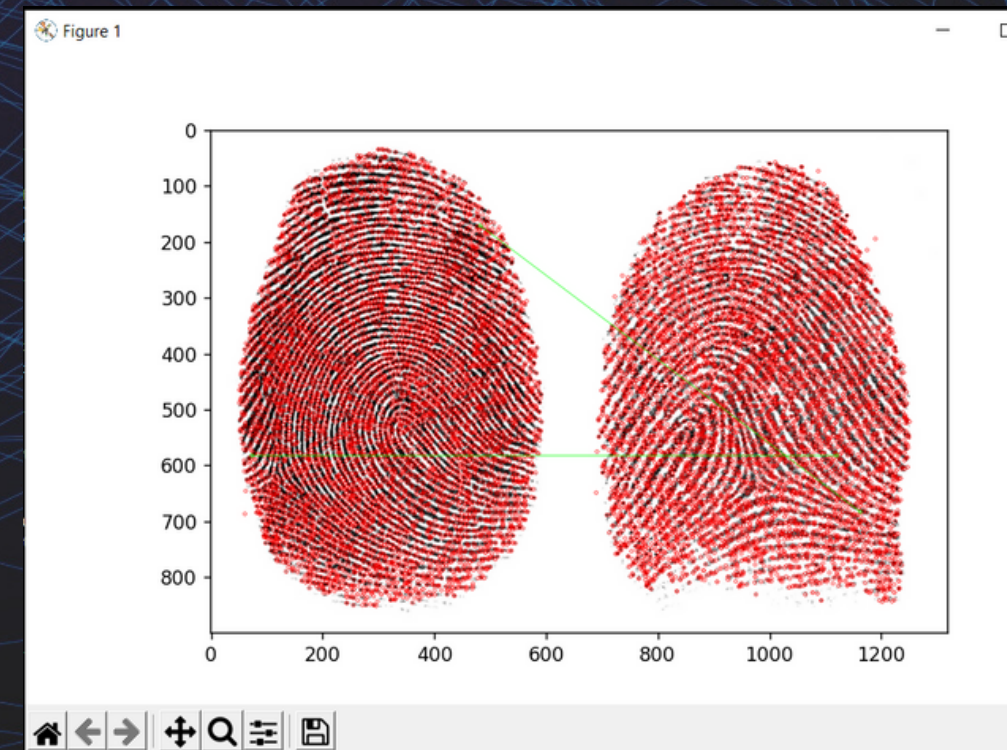
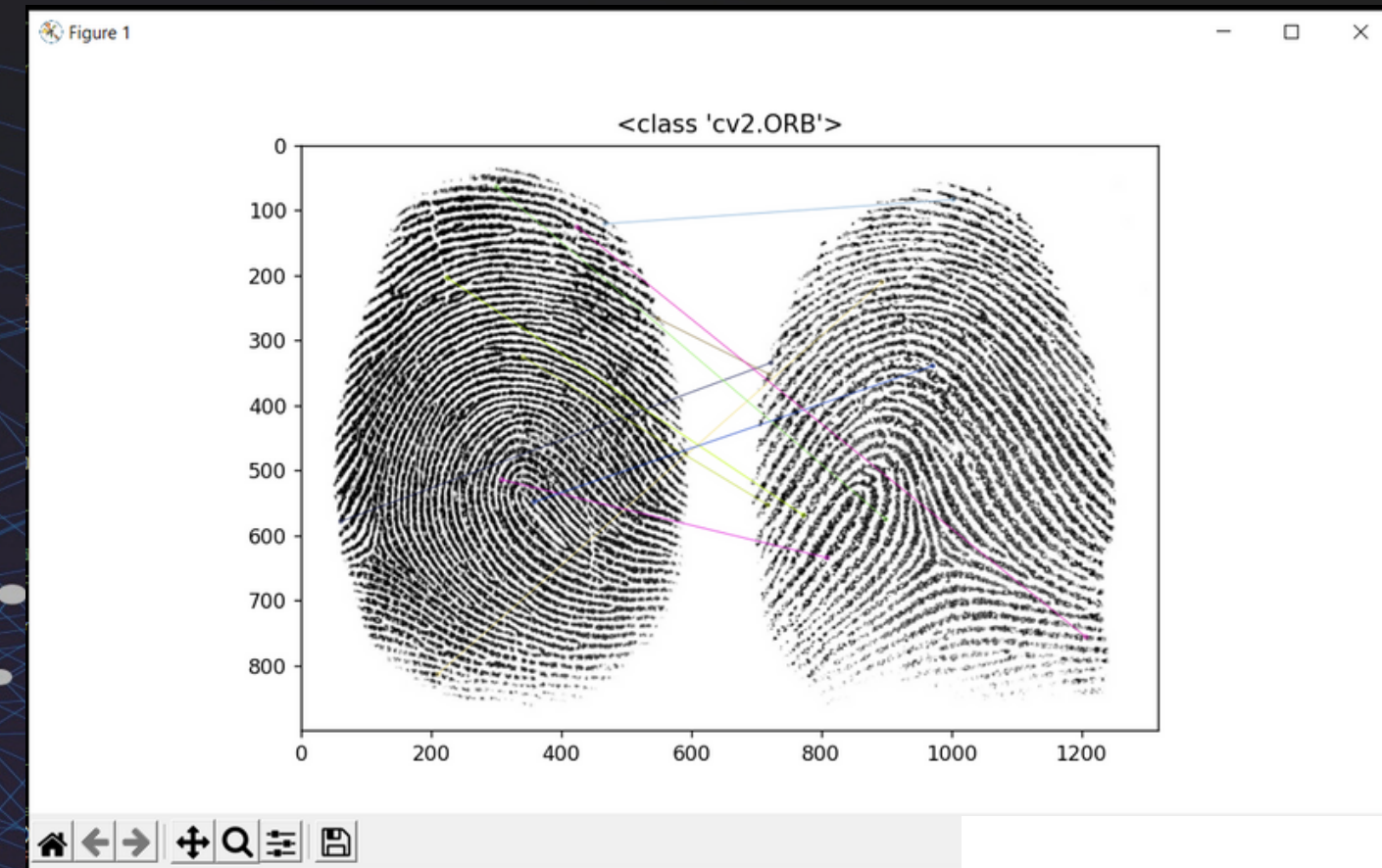


CODE PROCESS DESCRIPTION

- 1.import required libraries.
- 2.import image location and file.
- 3.convert colour for the image detection.
- 4.ORB detector used to detect key points,
- 5.matplotlib to plot diagrams.
- 6.feature match ing with SIFT algorithm.
- 7.plot image figure with key poits.
- 8.using keypoints, description, and images to detect high level features using FLANN algorithm.

RESULT:

Using this fingerprint feature analysis, we identify the features through the diagram. And then compare the 2 fingerprint images and find out if they are same person or different by the output obtained from the program. It helps in forensics to link crime records, commercial purposes like in ATM, etc.



CONCLUSION :

The uniqueness of fingerprints combined with the ease with which they are left on a surface when touched makes them an invaluable aid to those seeking to solve crimes. In general, fingerprint use in identification is very reliable, although every attempt must be made to remove or minimize errors.

Fingerprint Identification plays a very significant role in the field of Digital Forensics, they have provided key evidences in countless cases of serious crimes. Fingerprints have been used by police & other authorities to identify individuals that helped in solving cases related to thefts and murders, that eventually led to their arrest and convictions.

REFERENCES :

Wikipedia,
opencv.org,
python.org,
GitHub,
Kaggle.



THANK YOU

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