

Comparative Study of Optimized Completed Local Ternary Pattern (CLTP) for Face Recognition

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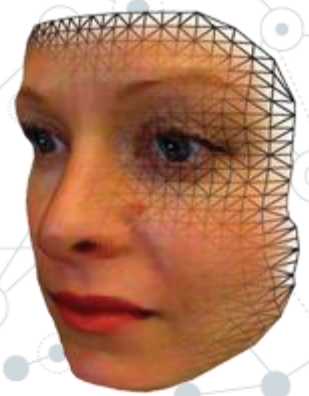
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Project Type: Research



**Universiti
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INTRODUCTION



- The face has the potential need for high security nowadays.
- In face recognition research, there are many face databases and there is no one descriptor can perform well with all databases.
- There are many feature descriptors are used and investigated for face recognition.
- LBP and its variant texture descriptors have some drawbacks
- CLTP is a new proposed texture to overcome the LBP drawbacks.

PROBLEM STATEMENT

- © LBP showed a good performance in many field but suffers from some drawbacks.
- © Many of texture features are proposed based on LBP and inherit the drawbacks.
- © Although CLTP overcome the LBP drawbacks and showed good accuracy in many applications result, but the threshold value to use in the CLTP was selected empirically.



OBJECTIVE



- 1) To overcome the CLTP manual threshold selection limitation using optimization algorithms to enhance its performance.
- 2) To develop a face recognition system using the new improved CLTP.
- 3) To study and investigate the new improved CLTP performance in face recognition systems with three different optimization algorithms using different standard face databases.

SCOPE



- This work is dedicated to face recognition.
- This work is planning to improve CLTP to use it in for face recognition task.
- This scope of study is limited to achieve a high recognition accuracy.

LITERATURE REVIEW



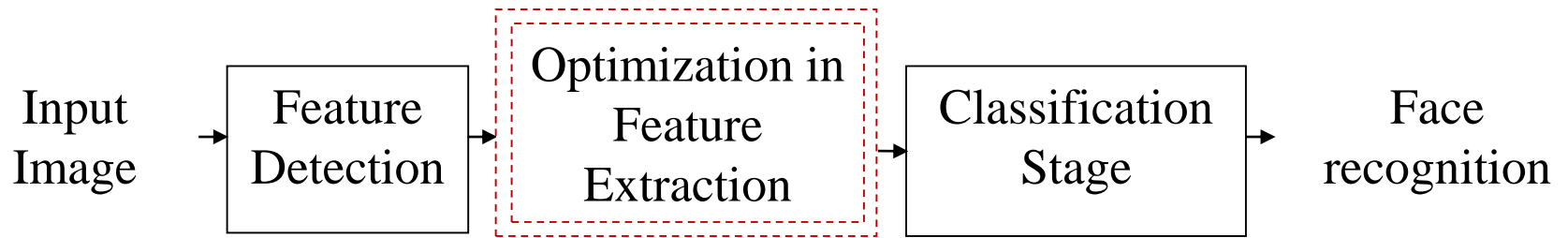
COMPARISON OF PREVIOUS ALGORITHM

Feature descriptors	Proposed by	Proposed year	Disadvantages
LHF	Zhao G, Ahonen T, et al.	2009	its work to achieves a rotation invariance by discarding the local orientation information will make some rough quantisation for the information.
LPQ	Ojansivu V, Heikkilä J.	2008	Limited to finite-sized image windows, so the result is still very tolerant of blur.
LBP	Ojala et al	1996	Small spatial area of support, noise sensitivity derives a huge variation.
LTP	X. Tan and B. Triggs	2007	Not invariant under grey-scale transform of intensity values as its encoding is based on a fixed predefined thresholding.
CLBP	Guo et al	2010	The CLBP pattern has the same problem as of traditional LBP, sensitive to noise as the value of the centre pixel is directly used as a threshold.

COMPARISON OF PREVIOUS ALGORITHM (2)

Feature descriptors	Proposed by	Proposed year	Disadvantages
COIF	Dong Wei, B.E., M.S.	1998	It do not have formula for coiflets for arbitrary genus, and no formal evidence of their existence for arbitrary genus.
FDCT	Candès E, Demagnet L, et al.	2006	It has high computational costs.
GOLD	Serra G, Grana C, et al.	2015	The space of covariance matrices can be formulated as a differentiable manifold, but not as a vector space. So, they can't promptly work with covariance matrices.
CLTP	T. Rassem and B. Khoo	2014	Double in size than CLBP and low speed to process the feature extraction.

METHODOLOGY



OCLTP

- ❖ Can say is an improvement of CLTP
- ❖ It using three different optimization algorithms to find the optimal threshold value in different database to use in CLTP extraction.
- ❖ Solve the issue of threshold value to use in the CLTP was selected empirically
- ❖ Can achieve a high recognition accuracy.

OPTIMIZATION ALGORITHM

OPTIMIZATION ALGORITHM	YEAR
ANT LION OPTIMIZER (ALO)	2015
WHALE OPTIMIZATION ALGORITHM (WOA)	2016
GREY-WOLF OPTIMIZATION ALGORITHM (GWO)	2014

OCLTP FLOWCHART

**Find Best
Threshold
Value**



Face Database / Gallery

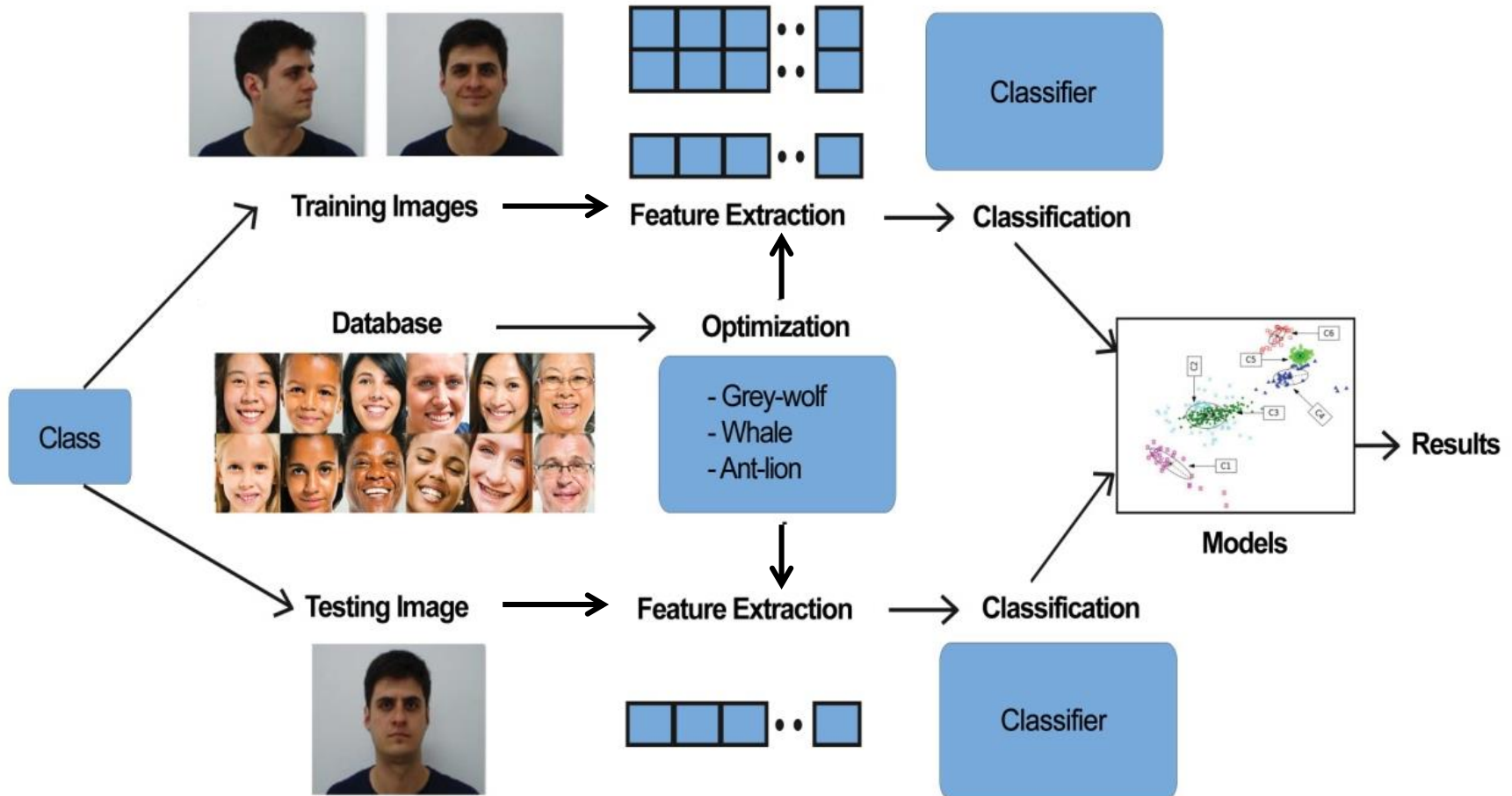
**Threshold
value**



CLTP extraction



OCLTP FLOWCHART



EXPECTED OUTCOME

◎ To achieve a high performance face recognition system using an OCLTP as an improvement of the original CLTP.

◎ OCLTP will show it has achieved highest accuracy result in face recognition system than existing texture descriptor and obtain the best result in different database in this research.

CONCLUSION

The previous proposed CLTP has some limitation so there is a need to enhanced the CLTP algorithm by using the optimization technique. A high performance face recognition system can be achieve by using an OCLTP texture descriptor as an improvement of the original CLTP.



THANK YOU

