



Maestría en Ingeniería en Sistemas y Computo Inteligente

Title

**System for automatic people identification by means
of computer vision and machine learning**

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1. Introduction

Identification of people is a process that performs the day-to-day human being, through various means, such as voice, fingerprint or ID card. It is often used to perform face recognition between one person and another, which can occur physically or picture.

However with increasing number of people performing this task becomes complex, tedious and sometimes confusing to determine that a person is who they say they are. Therefore they have proposed different solutions for automating the process of identifying a person using algorithms both computer vision and machine learning.

2. Objectives

2.1. General objective

Developing a system to automate the identification of people by means of face recognition using computer vision and machine learning.

2.2. General objective

- To build an interface to manage a people identification system.
- To characterize face images using the LBP and SIFT methods.
- To assess at least three machine learning algorithms for people identification.

3. Method

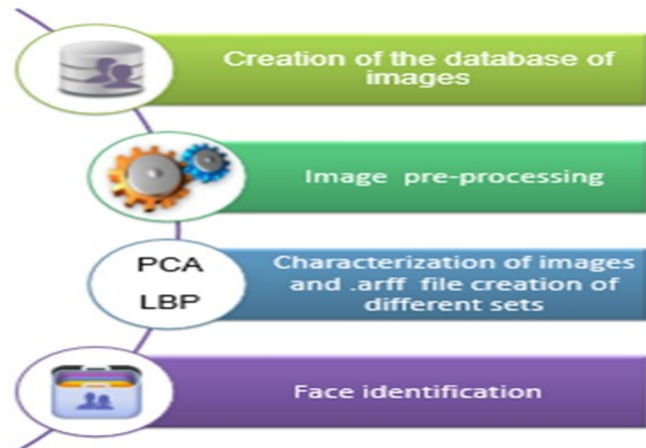


Figure 1. Methodology utilized in this research

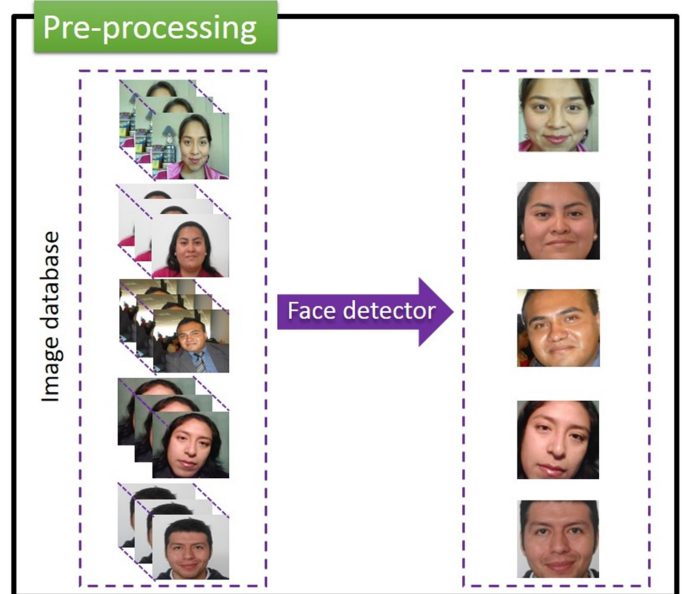


Figure 2. Sample pre-processing images of faces. Left: original images, right: pre-processing images

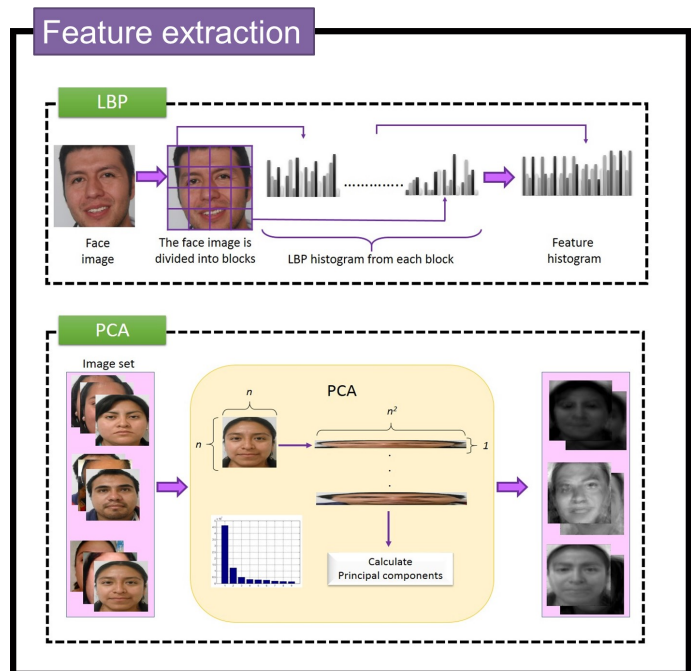


Figure 3. Characterization techniques. Up: LBP, down: PCA

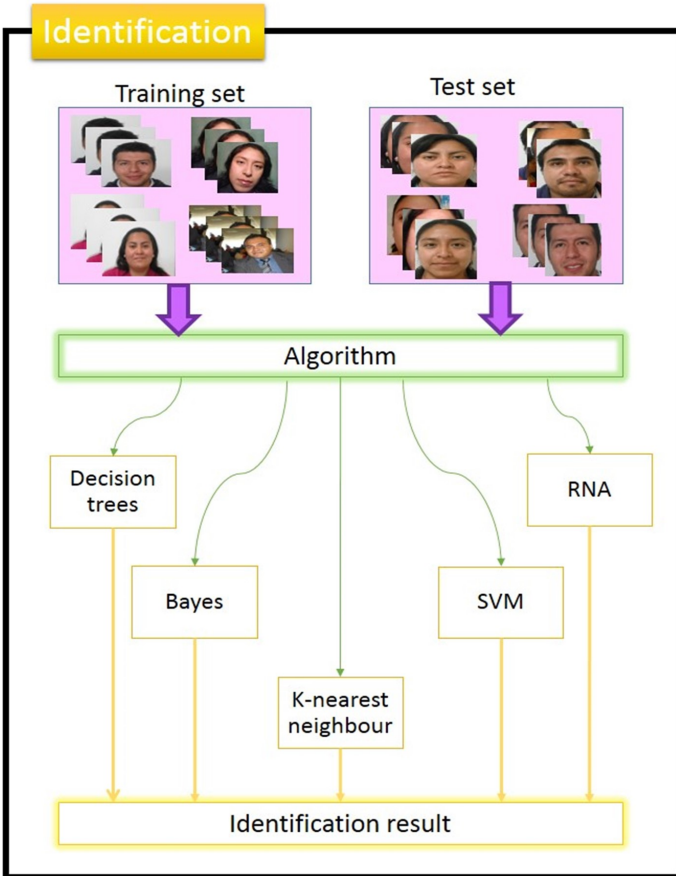


Figure 4. Classification with different methods of machine learning

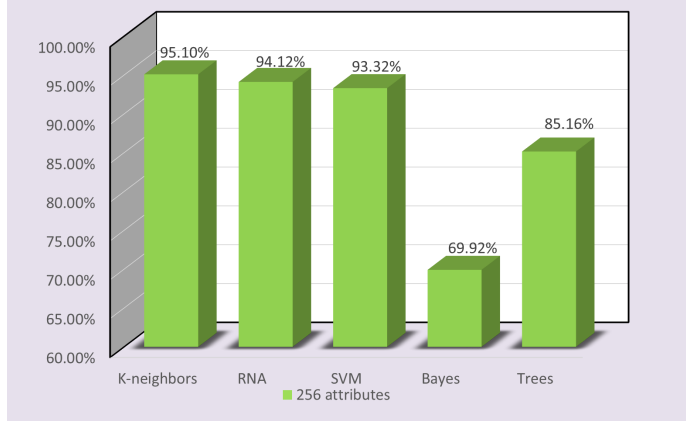


Figure 6. Comparison of algorithms with better classification accuracy using LBP

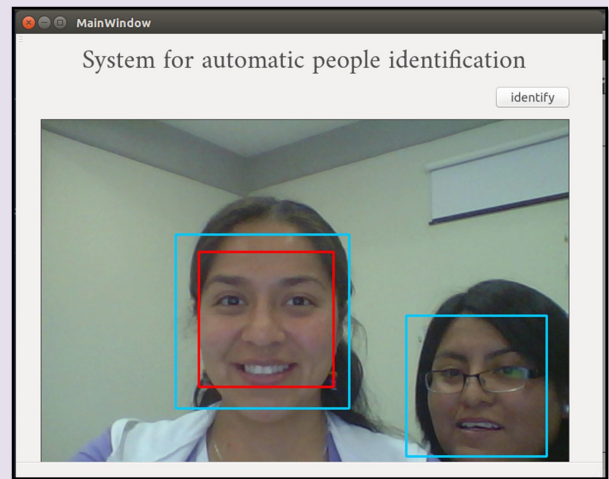


Figure 7. Interface people identification.

4. Results

Experimental results with different methods of machine learning were performed using two techniques of image characterization: PCA and LBP.

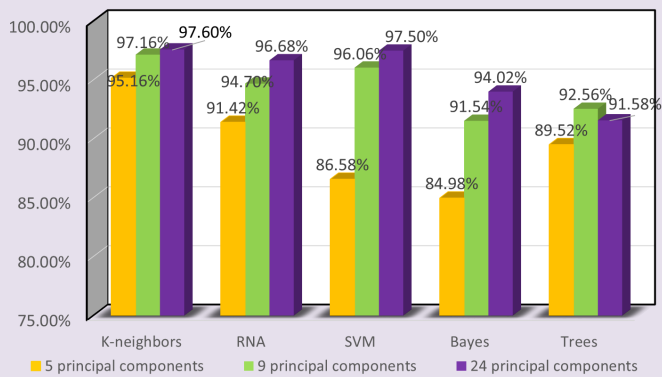


Figure 5. Comparison of algorithms with better classification accuracy using PCA

5. Conclusion

According to preliminary results we can conclude that the algorithm of k-nearest neighbors obtained the best identification accuracy with 97.6%. In contrast, the decision tree algorithm showed the lowest performance with 91.5%.

Acknowledgements

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