

## **ACKNOWLEDGMENT**

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Leman

## **ABSTRACT**

The use of highly secured and easy to use systems in the modern life has become an important issue. Using passwords for bank accounts, mails, credit, and debit cards is becoming more difficult and less secure. The use of biometrics in recognition systems has attracted the attention of researchers due to its simplicity and high efficiency. Ear has been introduced as one of the unique features of the human being that is stable for the whole life. Many works have been proposed about the use of ear biometrics in recognition. The use of neural network has also encountered a huge revolution due to the development of digital electronics and to its simple structure and high efficiency. Neural network has proven its ability in solving many non-linear problems with simple efforts. It has been widely proposed and used in biometrics and ear recognition. This work proposes the use of artificial neural network back propagation algorithm for ear recognition. The ear photographs will be processed and fed to the network in the learning process. A set of tests will be carried out to evaluate the efficiency of the ANN. Different low and high noise values will be used in order to test the efficiency of the proposed system. The results obtained from the different experiments have proved the high efficiency of neural networks for ear recognition. A recognition rate of 95% was obtained with slightly noised images, while a rate of 85% was obtained with highly noised images. These results are considered excellent and promising for better results in future works.

### **Keywords:**

Artificial neural networks, Biometrics, Ear recognition, back propagation.

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