Al in Face Recognition

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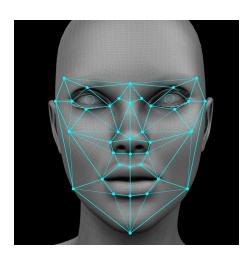
Introduction

A **facial recognition system** is a technology capable of matching a human face from a digital image or a video frame against a database of faces, typically employed to authenticate users through ID verification services, works by pinpointing and measuring facial features from a given image.



Techniques

 Geometrical features: feature extraction method based on ratios of distances, compute a set of geometrical features such as nose width and length, mouth position, and chin shape.



 Eigenfaces: new faces are compared to the ones in the training set.

Face image₁ =
$$(23\% \text{ of } E_1) + (2\% \text{ of } E_2) + (51\% \text{ of } E_3) + ... + (1\% E_n)$$

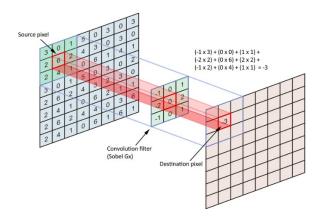


Convolutional Neural Networks (CNN)

The face recognition system usually made up though the CNN algorithm but, what is that?

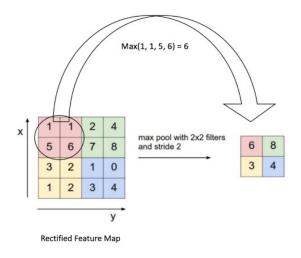
The convolutional neural networks consist in three type of hidden layers: the Convolutional Layer, Pooling Layer, Fully-Connected Layer.

Convolutional layer: Is the first hidden layer, it takes from the input a nxn size pixels to apply a filter on them. The filter matrix is of a smaller size than the input pixels matrix.



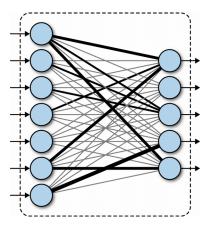
Convolutional Neural Networks (CNN)

Pooling layer: Its function is to reduce the spatial size of the representation to reduce the amount of parameters to work with.

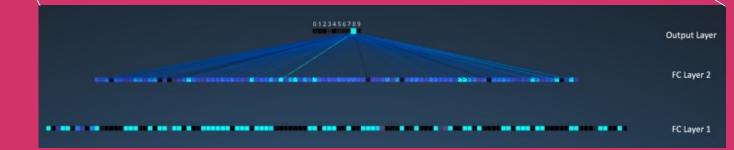


Convolutional Neural Networks (CNN)

Fully-Connected layer: Neurons in a fully connected layer have full connections to all activations in the previous layer, as seen in regular Neural Networks.







Applications

- Photography
- Unlock a phone
- Find missing people
- Help the blind people
- Identify people on social media





Conclusions

There are also some disadvantages:

- Threatens privacy
- Racist and sexist algorithms. There are some applications struggling while recognising black women.

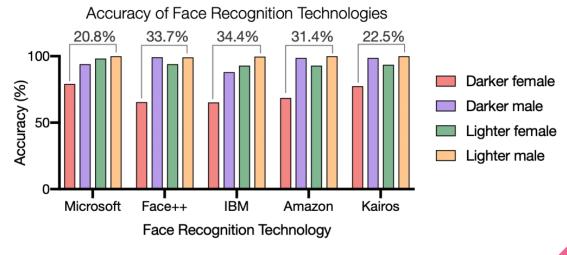


Fig.1 Results of "Gender Shades" project

Thank you for your attention!