**An Automatic Eye Iris Detection Method**

# Main phases:

*1- Image Preprocessing*

2- Selecting Window sizes

3- Entropy Score

4 - Iris Darkness Score

5- Hypothesis Calculation

6- Testing results on a dataset

**Description:**

1- Image Preprocessing

Converting images into grayscale and passing them into Viola & Jones face detector which uses haar-like features so we can focus on our area of interest (faces).

2- Selecting Window sizes:

*We set up windows to scan the image, where the iris radius r is approx third the face width.*

*w = 2r + deltaX , h = 2r + deltaY.  
 where deltaX ,deltaY are arbitrary constants added to our random windows.  
we select the best k windows in terms of entropy score.*

3- Entropy Score

Entropy is a good measure for uncertainty it's continuous, a strictly convex function, which reaches a maximum value when all probabilities are equal, and maximized in a uniform probability distribution *context.*

Shannon introduced an important concept which is the entropy, in the form

H score = , where wi is the ith window

4 - Iris Darkness Score

we sum up the pixel values within the range of radius r from the eye center to calculate our iris darkness score  
 C score =

5- Hypothesis Calculation  
Our Hypothesis is based on the summation of the two scores  
T score = H score + C score  
and we will select the center of the highest scored window as our our iris center.

6- Testing results on a dataset

Our Automatic Iris detector accuracy will be tested using a labeled dataset