**In this document, the main files related to watermarking in wavelet domain using 2D-GARCH models are introduced**

**1.Watermarking in wavelet domain**

* 1. **Insert watermark in wavelet domain:**

**Used in section 5-2-1 of book**

* Watermark insertion in D2,V2,H2 wavelet subbands
* [X,y,wD,wH,wV,zD,zH,zV]=watermark\_insert\_garch(X,wdr,wv);
* Inputs:
  + X:input image
  + Wdr: watermark to document ratio
  + wv: type of wavelet transform for example ‘db’4
* Important Outputs:
* y:watermarked image,
* wD: inserted watermark in D2
* wH: inserted watermark in H2
* wV: inserted watermark in V2

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* 1. **watermark detector in a wavelet subband based on using 2D-GARCH model**

**Used in section 5-2-1 of book**

function H=detector\_garch\_2D(y,w);

* Inputs:
  + Y: wavelet subband
  + W:watermark
* Important Outputs:
* H : is 1 if watermark detect and 0 if watermark not detect

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* 1. **watermark detector in a wavelet subband based on using 2D-GARCH-GG model**

**Used in section 5-4-1 of book**

watermark detector in a wavelet subband based on using 2D-GARCH-GG model

H=detector\_garch\_generalized\_Gaussian\_2D(y,w);

* Inputs:
  + Y: wavelet subband
  + W:watermark
* Important Outputs:
* H : is 1 if watermark detect and 0 if watermark not detect

Auxiliary files

* **watermark detector in a wavelet subband based on using Gaussian distribution (for comparison)n**

function H=detector\_gaussian\_2D(y,w);

* Inputs:
  + Y: wavelet subband
  + W:watermark
* Important Outputs:
* H : is 1 if watermark detect and 0 if watermark not detect
* **watermark detector in a wavelet subband based on using Generalized Gaussian distribution (for comparison)**

H=detector\_generalized\_Gaussian\_2D(y,w);

* Inputs:
  + Y: wavelet subband
  + W:watermark
* Important Outputs:
* H : is 1 if watermark detect and 0 if watermark not detect

**Note: Other files are related to different test reported in the book for example computing ROC and …**