**In this document, the main files related to denoising images in curvelet domain using 2D-GARCH models are described**

**1.Denoising in curvelet domain**

**For curvelet transform we used curvelab V2 by Candes et al**

**As mentioned in the book we used wrapping method so, we used fdct\_wrapping\_matlab folder and all of our files is in this folder but all folders of curvelab V2 are available**

**3.1. Denoising using 2D-GARCH model**

**Denoising using 2D-GARCH model use “**denoising\_curvelet**”**

**Used in section 4-3 of book**

* function x=denoising\_curvelet(y,p1,p2,q1,q2,va);
* Inputs:
  + y:noisy image
  + p1,p2,q1,q2: degree of 2D-GARCH model
  + va: variance of noise
* Important Outputs:
* x:denoised images

\*Note: for reducing multiplicative noise first use log transform and then above function

If not know the variance of noise use following function

x=denoising\_curvelet\_unkownvar(y,p1,p2,q1,q2);

* Inputs:
  + y:noisy image
  + p1,p2,q1,q2: degree of 2D-GARCH model
  + va: variance of noise
* Important Outputs:
* x:denoised images

**3.2 Denoising using 2D-GARCH-GG model**

**Denosing using 2D-GARCH generalized Gaussian (2D-GARCH-GG) model use “**denoising\_curvelet\_unkownvar\_GG**”**

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

x=denoising\_curvelet\_unkownvar\_GG(y,p1,p2,q1,q2);

* Inputs:
  + y:noisy image
  + p1,p2,q1,q2: degree of 2D-GARCH models in mixture model usually 1,1,1,1
* Important Outputs:
* x:denoised images

\*Note: for reducing multiplicative noise first use log transform and then above function