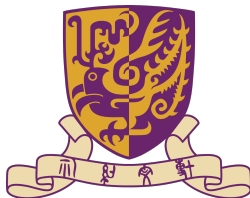# EIE4512 - Digital Image Processing

Totorial

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Corrupt an image with noise

Spatial noise filter

Adaptive spatial filter

Corrupt an image with noise

- Degradation Function

  $$g(x, y) = H[f(x, y)] + \eta(x, y)$$

- Function Definition
  ```
  g = imnoise(f, type, parameters)
  ```

- Adding Gaussian noise of mean m, variance var
  ```
  g = imnoise(f, 'gaussian', m, var)
  ```

- Adding Gaussian noise with zero-mean, local variance V
  ```
  g = imnoise(f, 'localvar', V)
  ```

- Corrupting Image with salt and pepper noise with density d
  ```
  g = imnoise(f, 'salt & pepper', d)
  ```

Spatial noise filter

- Spatial filtering on image G using a TYPE filter of size M by N.
  ```
  F = SPFILT(G, TYPE, M, N, PARAMETER)
  ```

- Ex:following

  ```
  F = SPFILT(G, 'amean', M, N)        Arithmetic mean filtering.
  F = SPFILT(G, 'gmean', M, N)        Geometric mean filtering.
  F = SPFILT(G, 'hmean', M, N)        Harmonic mean filtering.
  F = SPFILT(G, 'chmean', M, N, Q)    Contraharmonic mean
                                      filtering of order Q. The
                                      default is Q = 1.5.
  F = SPFILT(G, 'median', M, N)       Median filtering.
  F = SPFILT(G, 'max', M, N)          Max filtering.
  F = SPFILT(G, 'min', M, N)          Min filtering.
  ```

▶ An M-function implements Adaptive Spatial Filter, g is the input image, Smax is the maximum size of the adaptive filter window.

```
f = adpmedian(g, Smax)
```