Subject: Re: How to add 5% possion noise for a image in IDL
Posted by dplatten on Fri, 12 Apr 2013 13:40:37 GMT
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I took what Wayne posted and adapted it a bit. The function below will add a user-provided % of noise to a uniform image, where I'm defining % noise as (stdev / mean) * 100.

It doesn't work for non-uniform images at the moment.

Regards,

David

Test code:

```
seed = 1001L
testImage = FINDGEN(100,100) * 0.0 + 1000.0
PRINT, "Mean and standard deviation of original image is: " + STRING(MEAN(testImage)) + ", " +
STRING(STDDEV(testImage))

noisyImage = DJP_addNoise(testImage, 5.0, seed)
PRINT, "Mean and standard deviation of new image is " + STRING(MEAN(noisyImage)) + ", " +
STRING(STDDEV(noisyImage))

cgWindow, 'cgImage', testImage, WTitle='Original image', /Keep_Aspect
cgWindow, 'cgImage', noisyImage, WTitle='Image with noise added', /Keep_Aspect



FUNCTION DJP_addNoise, image, percentNoise, seed
  Compile_Opt IDL2

  IF(N_ELEMENTS(image) GT 0) THEN BEGIN

    ; Return an image with each value replaced by a Poisson deviate
    h = HISTOGRAM(image, MIN=0, REVERSE=rr)
    noisyImage = image

    FOR i = 0, N_ELEMENTS(h) - 1 DO BEGIN
      IF h[i] NE 0 THEN BEGIN
        sub = rr[rr[i]:rr[i+1]-1] ; Get subscripts
        currentMean = i+1
        noisyImage[sub] = RANDOMU(seed, N_ELEMENTS(sub), POISSON=currentMean)

        newMean = SQRT(currentMean) / (percentNoise / 100.0)
        noisyImage[sub] += newMean - currentMean ; this adjusts the standard deviation to the
required level
        noisyImage[sub] *= currentMean / newMean ; this adjusts the mean back to what it was to
```

```
start with
      ENDIF
    ENDFOR

    RETURN, noisyImage

  ENDIF ELSE BEGIN

    RETURN, 0

  ENDELSE

END
```