Subject: KMean Clustering of RGB Images
Posted by helaha on Tue, 08 May 2007 10:45:56 GMT

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Recently I tested the Kmeans clustering of an RGB image with the
CLUSTER and CLUST_WTR commands.
The results were not very promising, because they depended on the
image orientation and on the number of image pixels.
I'm not a specialist in clustering, but in my opinion the results
should be identical, especially regardless of the order of the data
points.

Here is a short script for testing. The total number of pixels can be
set with the variable "SmallSize" for the CONGRID command.
The REVERSE or TRANSPOSE commands can be activated optionally.
Any ideas?
Many thanks for any input!
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PRO Cluster_KMean_Image

  ;Load RGB Image
  ImageName = DIALOG_PICKFILE()
  CD, FILE_DIRNAME(ImageName)
  READ_JPEG, ImageName, RGBImage
  IIMAGE, RGBImage, /NO_SAVEPROMPT, /OVERPLOT

  Info = SIZE(RGBImage)
  ImageSizeX = Info[2]
  ImageSizeY = Info[3]

  ;Make image smaller and therfore the clustering time shorter
  SmallSize = 20
  RGBImage = CONGRID(RGBImage, 3, SmallSize, SmallSize, /INTERP)

  ;Optional
  ;RGBImage[0,*,*] = REVERSE(REFORM(RGBImage[0,*,*]), 2)
  ;RGBImage[1,*,*] = REVERSE(REFORM(RGBImage[1,*,*]), 2)
  ;RGBImage[2,*,*] = REVERSE(REFORM(RGBImage[2,*,*]), 2)
  ;or
  ;RGBImage = TRANSPOSE(RGBImage, [0, 2, 1])

  PixelN = ULONG(SmallSize * SmallSize)

  ;Convert to RGB Space with 3 variables and PixelN items

```
RGBSpace = REFORM(RGBImage, 3, PixelN)

;KMean Clustering
k = 2
Weights   = CLUST_WTS(RGBSpace, N_CLUSTERS = k, N_ITERATIONS = 20)
CenterInd = CLUSTER  (RGBSpace, Weights, N_CLUSTERS = 2)

Center = TRANSPOSE(Weights)

;Set RGB space to the cluster centers
FOR j = 0, k-1 DO BEGIN
    Ind = WHERE(CenterInd EQ j, Count)
    PRINT, 'Count Cluster k', j+1, Count
    FOR d = 0l, Count-1 DO RGBSpace[*, Ind[d]] =
REFORM(Center[j,*])
ENDFOR
;Convert RGB Space to Image
Image_Clust = REFORM(RGBSpace, 3, SmallSize, SmallSize)

;Display magnified clustered image over original image
IIMAGE, CONGRID(Image_Clust, 3, ImageSizeX/2, ImageSizeY/2), /
NO_SAVEPROMPT, /OVERPLOT

END
```