CSE 344: Computer Vision

Homework 4 ; Arka Sarkar 2018222

Question 2

Obtaining a global feature descriptor using Spatial Pyramid Pooling (SPP).

The image was divided into 4,9,16,25 parts and for each part we calculated the mean and variance of all the color components. So we get a 54*6 = 324 len feature vector.

Algorithm

```
def calculateSppVector(img):
      parts = [4,9,16,25]
      vector = []
      for p in parts:
      size = int(p**0.5)
      n = int(img.shape[0]//size)
      for i in range(size):
              for j in range(size):
                      curr = img[i*n: (i+1)*n,j*n: (j+1)*n, : ]
                      vector.extend(calulateStats(curr))
      return vector

def calulateStats(matrix):
      vector = []
      for i in range(3):
              mean = np.mean(matrix[:,:,i])
              var = np.var(matrix[:,:,i])
              vector.append(mean)
              vector.append(var)
      return vector
```

Input/Output

Image Size - (240, 240, 3)

Global Feature vector for the image is : [76.29666666666667, 1795.2026833333334, 139.37625, 912.4402414930555, 116.17784722222223, 1055.340939809992, 85.06152777777778, 533.8684365547839, 130.41020833333334, 713.840965234375, 105.235625, 489.6009391927083, 62.27673611111111, 1231.2993199025848, 124.40694444444445, 1077.005507330247, 94.06784722222223, 701.6003273099924, 66.64708333333333, 1020.7082276041667, 124.75430555555556, 1008.2407453510801, 94.94979166666667, 629.3464374565972, 88.70765625, 1181.204378881836, 140.52390625, 1037.490990991211, 115.87390625, 1001.4995691162109, 81.43484375, 1433.370129663086, 136.7003125, 1098.6095624023437, 108.69078125, 960.3011025146484, 84.91796875, 379.1678021240234, 126.33171875, 616.7438689208984, 102.45546875, 433.94207946777345, 73.5140625, 1616.9179272460938, 141.60078125, 558.4392181396485, 106.15078125, 576.5389837646485, 45.0084375, 1618.3214913085937, 130.46453125, 1068.7093669677736, 115.7359375, 1189.5293334960938, 68.80109375, 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