Performace on differnet parameter setting in GA-BPNN

1st Zih Jie Lin

Computer Science Information Engineering.

Fu Jen Catholoic University

New Taipei City, Taiwan

406261597@gapp.fju.edu.tw

I. 問題一

程式碼:

```matlab
% load color image and display it
I = imread('lenna-RGB.tif');
figure,
subplot(3,2,1), imshow(I), title('Original image');
% convert it to grayscale if needed
grayI = rgb2gray(I);
subplot(3,2,2), imshow(grayI), title('Grayscale image')
% divide the image into 4 parts with the same size
[row,col] = size(grayI);
I1 = grayI(1:round(row/2), 1:round(col/2));
I2 = grayI(1:round(row/2), round(col/2)+1:end);
I3 = grayI(round(row/2)+1:end, 1:round(col/2));
I4 = grayI(round(row/2)+1:end, round(col/2)+1:end);
subplot(3,2,3), imshow(I1), title('UpperLeft')
subplot(3,2,4), imshow(I2), title('UpperRight')
subplot(3,2,5), imshow(I3), title('LowerLeft')
subplot(3,2,6), imshow(I4), title('LowerRight')
```
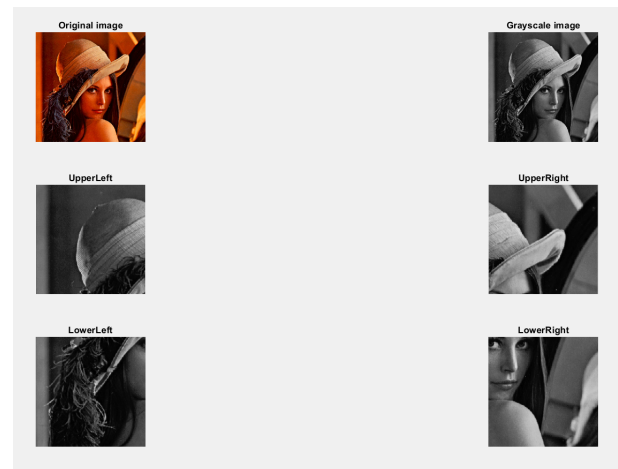

Fig. 1. The result of problem1

II. 問題二

A. 選定辦法

- Nearest-neighbor interpolation
- Bilinear interpolation
- Bicubic interpolation

B. 圖片

Fig. 2. Cat

Fig. 3. Cat after converting to grayscale

C. 程式碼

```
1  I = imread('cat.jpg'); %% read picute
2  grayI = rgb2gray(I); %% to grayscale
3  imwrite(grayI,'grayCat.jpg');
4
5  grayI = imread('grayCat.jpg');
6
7  S = ["nearest","bilinear","bicubic"]; %
       test method
8
9  for i = 1:3
10     plotno = i;
11     grayI2 = grayI;
12     for j = 1:10
13         for N = 1:j %% shrink the size of
                the image by two 6 times (
                recognize limit)
14             grayI2 = imresize(grayI2,0.5,
                    S(i));
15         end
16
17         for N = 1:j %% shrinking
                imagesback to its originalsize
18             grayI2 = imresize(grayI2,2);
19         end
20
21         % figure, imshow(grayI2)
22         subplot(10, 3, plotno), imshow(
                grayI2), title(S(i) + j);
23         plotno = plotno + 3;
24         imwrite(grayI2,"grayCat"+ i + "_"
                + j + ".jpg");
25     end
26  end
```

D. 比較

三種辦法都在縮小 7 次在復原後無法辨識為一隻貓，Nearest-neighbor interpolation 的顏色和原圖較相近。

隨著縮小次數增加，Nearest-neighbor interpolation 會變成一格格大黑/白點。Bilinear interpolation 則像是起霧一般，變成一小點黑白點。Bicubic interpolation 則是皆於兩者之間。

Fig. 4. Using Nearest-neighbor interpolation shrink the size of the image by two 7 times and undo.
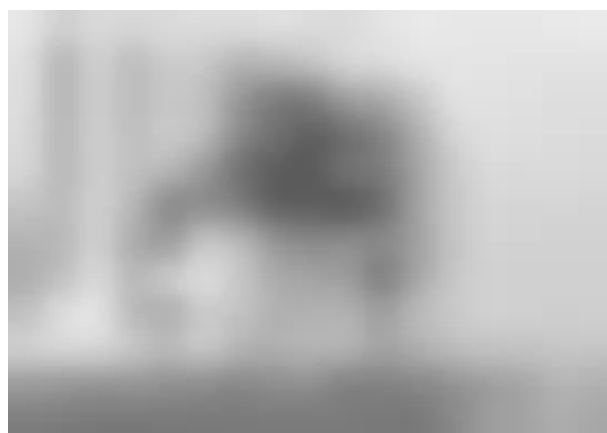

Fig. 5. Using Bilinear interpolation shrink the size of the image by two 7 times and undo.
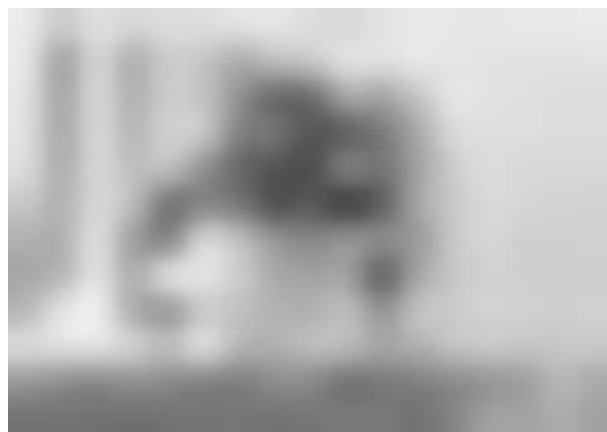

Fig. 6. Using Bicubic interpolation shrink the size of the image by two 7 times and undo.