Comp3402 Unit1 Unsharp Masking

C.B.Price September 2021

Purpose	So far, we have enhanced images by stretching their contrast, or smoothing to reduce noise. Here we shall see how to enhance the edges of images, to make them sharper. A very useful technique of image enhancement used in the medical sector.
Files Required	Octave scripts in the zipped folder "Octave_ImProc_Release" on the module site.
ILO Contribution	Position Paper 1 (part 1) Learning outcome 2.
Send to Me	
Homework	

Activities

1   Applying Unsharp Masking

As discussed in class, unsharp masking first smooths the original image, and subtracts the smoothed from the original. This difference image will contain pixels near edges in the image. We then add a proportion of the difference to the original, thus emphasising regions near edges.

(a) Run the script "UnsharpMasking". Start with the default image "lena.jpg". You will see the original and difference images. Choose a value for alpha. Here's how the output image is calculated

ImOutput = ImInput + alpha*(ImInput – ImInputSmoothed)

(b) Try with some other images. This should work well with color images, since we are not changing the distribution of pixel values.

2   Compare with Histogram Equalization and contrast stretching

When I was working as a research assistant at the Academic Hospital in KULeuven (Belgium), I was developing image enhancement algorithms for clinical diagnosis. Radiologists who were evaluating my algorithms preferred unsharp masking over contrast stretching or histogram equalization.

(a) Why do you suppose this was?

(b) Do you have any preference? (or not?) Why?