Subject: Seeking specific graphic filter - Any help?
Posted by Bernhard Schaffer on Mon, 12 Dec 2005 07:58:58 GMT
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Hi!

This is not directly an IDL question, although I want to implement the filter in IDL later on (and may then ask again :c))

I just post it here, because I have the hope that among the audience some "graphic experts" might be listening,

who can point me in the proper direction. I am looking for a good image filter or image processing routine for my

image data.

The aim of the images is to identify phases. The image data I get has the following "specialties" plus "additional

knowledge" to be used:

1.) - The "(physical) source" from which my image data is generated consists of two or more phases with more

or less sharp interfaces to each other. So, despite a short translation width of a few pixels, each point in the image

is either of the phases.

2.) - The images start up with "zero-counts" in each pixel. The, depending on the physical source, individual pixels

get increased values. To clarify this: say the upper half of an images is Phase A, and the lower one Phase B. The

image acquisition starts with 0 everywhere. Now, step-by-step, one (random) pixel is chosen. If this pixel is within the

upper half, the pixel-value is increased by 1. If in the lower, nothing happens. (The image is going to "map" Phase A)

After a while I will have an image with "no" values in the lower half, and several bright pixels in the upper half. (But also

several "dark" pixels in between.)

3.) - The phases have a "concentration" too, on which the value of the pixels will be further increased. Following the

picture from above, we would still increase "nothing" in the lower half, but plus "A1" in the upper half, whereas "A1" stands for the

concentration of the phase A in this pixel. After a while we would therefore create an image which is "dark" in the lower half, but

has several bright pixels in the upper half. However, some regions in the upper half will hold "brighter" pixels than others.

4.) - Unfortunately, the image will also contain additional "noise"-pixels. Say, to a certain extent, a random pixel will increase its value by 1, independently of where on the map it sits.

All together we end up with an image which is "zero" in general, has some individual "brighter (noise) pixels" all over, and has

more bright pixels in the upper half (more dense) as well as brighter pixels there (more intensity). Within the upper half, there will be

some regions with in general "brighter" pixels. We, additionally, have the knowledge, that the interface between "Phase A, where pixels should have intensity, depending on the concentration of Phase A" and "Phase B, where no pixels should show any intensity" is rather sharp.

The filter I am seeking should provide me with the following:

An image with a "smooth" intensity-variation, but outlining Phase A/Phase B SHARPLY. The "smooth" variation within Phase A should

represent the "concentration" of Phase A.

Now the problem I get with "standard" Low-Pass filters is, that I get my "smooth" variation in Phase A, but I will loose my "sharp" interface in between the phases. However, I need to "segmentize" the image into the two

phases (currently done by thresholding, therefore I need the smooth variation within Phase A).

I created three sample image to demonstrate the problem:
http://bejoscha.tavernmaker.de/tempstore/demo.htm

Any help is appreciated!

regards,

Bernhard Schaffer
