
Subject: Re: Three questions

Posted by [muswick](#) on Thu, 09 Apr 1998 07:00:00 GMT

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In article <352BD7FA.256B@bial1.ucsd.edu>,

David Foster <foster@bial1.ucsd.edu> wrote:

>

> biomedical wrote:

>>

>> Three questions:

>>

>> 1: what is 'sharp' function to images, or 'sharpening'?

>> what is 'unsharp' ? how to do them in IDL?

>

> These are just basic filtering techniques, to enhance either

> low-frequency or high-frequency information in the image.

> You can use convolution (CONVOL) with specialized kernels to

> perform both.

'sharpening' is as David states, a filtering technique to enhance high-frequency information. If you plot the gray scales of one row of an image, you would see the plotted points go up for white and down for black. At the edges of objects, you see several points changing in value (from the left side of the edge) to the value from the other edge.

```
      .
    ...  ....  ...
      ..      .      .
      ..      .      .
      ...     ....  ...
      .
10 pixel  10 pixel  10 pixel plot
plot of orig. plot sharpened  sharpened with
                (ideal)  overshoot.
```

The unsharp mask is a method of sharpening, in which the original image is smoothed (unsharpened), then the difference of (original - smooth) is the unsharp mask. This mask is then added in various degrees to the original to effect sharpening.

Applying to the above example.

```
gray
value
```

```
6
5  ...      ..      ...
4  ..      ...      .
3  ..      ...      .
```

```

2      ...      ..      ...
1      ...      .      .
0      .. .. ..
-1     .

```

10 pixel plot of orig. 10 pixel plot smoothed 10 pixel plot unsharp mask 10 pixel plot sharpened by adding (orig - smooth) the unsharp mask

Now I'll proceed with the rest of your questions.

```
>
>> 2: how to read 1-bit Tiff (mono) file?
```

Unfortunately, RSI does not provide a very robust set of routines to read some of the standard file formats, especially those items that are not part of the baseline.

Typically, 1-bit tiff images are stored as G4 encoded Hoffman/Run-Length. IDL unfortunately does not support this. One method I know to read these images would be to use Microsoft Imager on a PC, then convert and store the images as 8bit gray scale. Then read this image into IDL. There is software to convert TIFF files to other formats, it just depends on you platform and compilers etc.

I would love IDL to support G3/G4 TIFF, and 12 bit JPEG.

```
>> 3: how to do the Matlab image processing, please take a look at:
>> http://www.mathworks.com/demos/toolbox/image/ipss0011.html
>> how to removes the minor regions, skeletonize, ...
>
...
>
> IDL can be used to do what the slide show does, but will require
> some coding. When you get a better idea of what you need, ask
> the newsgroup again, and be more specific. I'm sure someone has
> coded some of these tasks.
>
> Dave
>
```

David is correct on the fact that IDL can do all of the operations, though some procedures may need to be written. I think I am most concerned at this point on your input data, given your request of 1-bit TIFF images. Are your images already binary? or are they half-tone representations?

Good Luck

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