
Subject: Re: Fractional Pixels Origin?

Posted by [Mark Hadfield](#) on Sun, 19 Feb 2006 20:50:35 GMT

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JD Smith wrote:

> ... the natural "I'm a tiny ant living on the
> surface of your detector and measuring pixel positions from the edge
> with my tiny little ruler": [0.5,0.5].

Suffice it to say that's what natural to one person can seem very unnatural to another.

Well perhaps it doesn't suffice, so I'll spell it out. I am a tiny scientist crawling over a chess board measuring stuff. I go the first square and make a measurement in its centre: I'll store that at index [0,0] and record the location as [x0,y0]. Then I move through the squares on the chess board stepping dx in the x direction by in the y direction until I get to [x0+63*dx,y0+63*dy]. I now have a set of measurements, my_data, dimensioned [64,64], and a pair of location vectors, x=x0+dx*findgen(64) and y=y0+dy*findgen(64). The measurements are *at* the locations, as is only natural.

I can contour this:

```
contour, my_data, x, y
```

I can do a surface

```
surface, my_data, x, y
```

or I can plot a slice

```
plot, x, my_data[:,3]
```

Then I think, "wouldn't it be cool to show this data with one of those new-fangled false-colour images!" Obviously, I want the command to be

```
my_image_plot, my_data, x, y
```

Now the image will fill the space $-0.5 \cdot dx < x < 63.5 \cdot dx$, $-0.5 \cdot dy < y < 63.5 \cdot dy$, but that's a detail for the plotting program. Then I think, "Hang on. I don't like the little square, uniform areas around each data point, because this variable varies smoothly" so I change to an image in which the colour is interpolated between data points. The data points are still at the same locations, so now I want my image to fill the space $0 < x < 63 \cdot dx$, $0 < y < 63 \cdot dy$.

So my contention is that if you think of images as just another way to

show data, not privileged above contours, surfaces, then the natural convention is to have the lower-left data point at [0,0].

--

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