Subject: Re: Fitting Circles
Posted by Struan Gray on Wed, 01 Dec 1999 08:00:00 GMT
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F.N.Hatfield@Leeds.ac.uk writes:

> I am trying to fit a circle to a set of points (x,y), and
> from this determine the centre point (x0,y0) and radius r0.
> It is also very important that I obtain the standard
> deviations or errors in the x0,y0 and r0.

I can see two approaches, depending on what you mean by *the* s.d..

First, Craig Markwardt's MPFIT and associated routines are much more useful than curvefit:

http://cow.physics.wisc.edu/~craigm/idl/

This will let you find the circle with the mimimum least squares error w.r.t. your set of points. You can then define a suitable region of r0,x0,y0 space and simply calculate the least squares error for an appropriately dense set of points. IDL's built in MOMENT routine can then be used to extract the s.d. for each variable.

Alternately, there is a simple algebraic expression for the unique circle passing through any three points. If you calculate it for all permutations (warning: the number of permutations will explode if you have lots of points) you can generate arrays of r0, x0, and y0 values. Again, MOMENT can then be used to extract statisics (or you can roll your own mean and s.d. calculation).

Struan