Subject: Re: Minimum area ellipse - quadratic optimisation?
Posted by Paolo Grigis on Thu, 16 Feb 2006 15:15:30 GMT
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well, since you said that the center is fixed:

find the minimum area circle (which has the radius equal the distance
from the farthest point to the center, very easy) and squeeze it progressively
(along the direction perpendicular to the line connecting the center
to the farthest point) until you get a point outside the ellipse.
Trace one step back, and you're done!

Ciao,
Paolo

Olivia wrote:
> Dear All,
>
> My aim is to fit an ellipse with a known center onto a distribution of
> points, where all points have to be inside or on the ellipse, and the
> ellipse chosen is of the minimum area.
>
> I thought a brute force and not very clever way of doing this would be
> to calculate the area taking each set of 3 points to solve the 3
> remaining unknowns, (a, b, and orientation angle), in the ellipse
> equation, and finding which one had the smallest area. But this
> wouldn't work obviously as there would be no condition that all the
> other points have to be inside the ellipse. I have read up on quadratic
> optimization but have to admit I do not really understand the maths.
>
> I posted on this topic before, but it is important that my ellipse
> fitting method does not rely on convex hulls. I wrote a program which
> does fit ellipses to the point distributions, but not the ellipses with
> the minimum area.
>
> I am sure the problem can't be as hard as I am finding it, and I am
> feeling right now like drawing the 600 or so ellipses my program needs
> myself! Any suggestions really would be very helpful. Thanks,
>
> Olivia
>