Subject: Minimum area ellipse - quadratic optimisation?
Posted by Olivia on Thu, 16 Feb 2006 14:19:07 GMT
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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