
Subject: MINIMUM DISTANCE BETWEEN TWO CURVES

Posted by [Mark C.](#) on Thu, 22 Jun 2000 07:00:00 GMT

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Given:

$a=f(x,y,z)$ and $b=g(x,y,z)$, both a and b are separate curves. (Not straight lines. Nor do they loop over themselves). f and g are unknown functions. Only know g and f by some points in 3D space. Points are irregularly spaced.

Objective:

Find the minimum distance between a and b . Give the coordinate where this minimum occurs in term of the nearest point on a and the nearest point on b .

Needs help:

Does anyone have a routine to do such calculation using IDL? Any other suggestions appreciated.

Thanks in advance,

Mark Chan

Subject: Re: MINIMUM DISTANCE BETWEEN TWO CURVES

Posted by [David Fenyes](#) on Tue, 04 Jul 2000 07:00:00 GMT

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> $a=f(x,y,z)$ and $b=g(x,y,z)$, both a and b are separate curves. . . .

> Find the minimum distance between a and b . Give the coordinate where this

You are minimizing $F(i)-G(j) = f(x(i),y(i),z(i))-g(x(j),y(j),z(j))$, a func. of 2 params. There is no general method for accomplishing this for f and g unknown. It's been a while since I used IDL, but it uses Numerical Recipes, which has some minimization routines, including simplex (will gravitate to a local minimum) and simulated annealing (better chance of global minimum). I seem to recall some of these are in IDL.

I've seen some genetic programming algorithms on the web as well. Any good algorithm or operations research book should get you started.

David

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