Subject: One ellipse to rule them all
Posted by ianpaul.freeley on Mon, 11 Feb 2008 22:30:12 GMT
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I'm hoping someone has done this before and can help me out.

I have a bunch of x,y points, and I'd like to find the ellipse (with
minimum area) that encompasses all of them. Any thoughts?

cheers,
I.P. Freeley

Subject: Re: One ellipse to rule them all
Posted by Vince Hradil on Tue, 12 Feb 2008 00:40:56 GMT
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On Feb 11, 5:55 pm, Vince Hradil <hrad...@yahoo.com> wrote:
> On Feb 11, 5:06 pm, ianpaul.free...@gmail.com wrote:
>
>> On Feb 11, 4:51 pm, David Fanning <n...@dfanning.com> wrote:
>
>>> ianpaul.free...@gmail.com writes:
>>>> I'm hoping someone has done this before and can help me out.
>
>>>> I have a bunch of x,y points, and I'd like to find the ellipse (with
>>>> minimum area) that encompasses all of them. Any thoughts?
>
>>> I can show you how to find an ellipse:
>
>>> http://www.dfanning.com/ip_tips/fit_ellipse.html
>
>>> To enclose all the points I would, uh, expand it
>>> slowly. :-)
>
>>> Cheers,
>
>>> David
>
>>> --
>>> David Fanning, Ph.D.
>>> Fanning Software Consulting, Inc.
>>> Coyote's Guide to IDL Programming (www.dfanning.com)
>>> Sepore ma de ni thui. ("Perhaps thou speakest truth.")
>
>> My gut tells me I should be able to do it analytically. I *think* the
>> two points that have the largest separation should define the major
>> axis and position angle. Then I just need to fit for the minor axis

>> from the rest of the points, and the largest one is the winner.
>
> Look here - and references therein:http://www-eleves-isia.cma.fr/documentation/CgalDoc2
.4/basic_lib/Opti...

Here's Welzl's paper: http://citeseer.ist.psu.edu/235065.html

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Subject: Re: One ellipse to rule them all
Posted by David Fanning on Tue, 12 Feb 2008 05:56:19 GMT
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Vince Hradil writes:

> Look here - and references therein:
> http://www-eleves-isia.cma.fr/documentation/CgalDoc2.4/basic
_lib/Optimisation_ref/Class_Min_ellipse_2.html

I haven't looked, yet, and I am sure the answer
is there, but what about finding all those points
on the convex hull:

http://www.dfanning.com/tips/convex_hull.html

And then fitting an ellipse to them, ignoring the
points inside. It would be an interesting experiment
to see if this gets you anywhere close to what you
are looking for. I haven't time for the experiment
myself, but the code is all there and...

Cheers,

David

--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming (www.dfanning.com)
Sepore ma de ni thui. ("Perhaps thou speakest truth.")
