Subject: Re: Fitting an ROI to a distribution of points
Posted by David Fanning on Wed, 01 Feb 2006 17:14:49 GMT
View Forum Message <> Reply to Message

Olivia writes:

> I have a set of (x,y) coordinates which represent point-like galaxies
> in a galaxy cluster. Ultimately I want to describe the shape of the
> cluster as an ellipse, but I was planning on making some kind of blob
> first. I thought of gaussian smoothing, but I cannot work out how to
> get a filled in shape described by pixels to start working with. Does
> anyone have any ideas?

Here are a couple of articles describing techniques that you might be able to use. The first describes how to create a convex hull around a set of points. You could fill in the polygon (convex hull) to create a blob of some sort. The second describes how to calculate an ellipse for a set of random points using a weighed average approach.

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

Cheers,

David

--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: http://www.dfanning.com/

Subject: Re: Fitting an ROI to a distribution of points
Posted by Edd Edmondson on Wed, 01 Feb 2006 17:21:20 GMT
View Forum Message <> Reply to Message

Olivia <olivia.roberts@merton.ox.ac.uk> wrote:
> I have a set of (x,y) coordinates which represent point-like galaxies
> in a galaxy cluster. Ultimately I want to describe the shape of the
> cluster as an ellipse, but I was planning on making some kind of blob
> first. I thought of gaussian smoothing, but I cannot work out how to
> get a filled in shape described by pixels to start working with. Does
> anyone have any ideas?

Plenty of ways, the majority of which I wouldn't dare include in an astrophysical analysis. Better to bite the bullet now and have a

slightly complex way of handling it than be trying to figure out exactly what effects your choice has on your analysis later.

For now, if you just want to get a filled in shape it might be best to find the minimum enclosing circle or ellipse. Your cluster shouldn't have so many members that it would be impractical to calculate the angular distance between all members and find the most distant pair. Having that code in place later will probably not be entirely wasted when you change method slightly too.

If you're working in astrophysics at Oxford say hello from me - I left last month :-)

--
Edd

Subject: Re: Fitting an ROI to a distribution of points
Posted by Edd Edmondson on Wed, 01 Feb 2006 17:24:10 GMT
View Forum Message <> Reply to Message

David Fanning <davidf@dfanning.com> wrote:
> Olivia writes:

>> I have a set of (x,y) coordinates which represent point-like galaxies
>> in a galaxy cluster. Ultimately I want to describe the shape of the
>> cluster as an ellipse, but I was planning on making some kind of blob
>> first. I thought of gaussian smoothing, but I cannot work out how to
>> get a filled in shape described by pixels to start working with. Does
>> anyone have any ideas?

> Here are a couple of articles describing techniques that you
> might be able to use. The first describes how to create
> a convex hull around a set of points. You could fill
> in the polygon (convex hull) to create a blob of some
> sort. The second describes how to calculate an ellipse
> for a set of random points using a weighed average
> approach.

> http://www.dfanning.com/tips/convex_hull.html
> http://www.dfanning.com/ip_tips/fit_ellipse.html

After posting, I'd definitely take that fit_ellipse approach!

--
Edd

Subject: Re: Fitting an ROI to a distribution of points
Posted by Olivia on Fri, 10 Feb 2006 15:42:39 GMT
View Forum Message <> Reply to Message

Thanks, that was really helpful!

Olivia