
Subject: Re: Measuring sphericity of a set of voxels.
Posted by [penteado](#) on Fri, 28 Aug 2009 05:22:12 GMT
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On Aug 28, 1:32 am, Gianguido Cianci <gianguido.cia...@gmail.com> wrote:

- > Does anybody have ideas on how one could determine how close to
- > spherically symmetric a set of voxel intensities are?
- >
- > The way I see it there are two separate questions:
- >
- > 1. how rotationally symmetric are the brightness values
- > 2. how constant are the values as you get farther from the center
- >
- > I am most interested in #1. But #2 is cool too!
- >
- > Was thinking of getting the principal axes and checking how similar
- > they are to each other for Q #1... but I suspect there might be a
- > better way.

Though spherical distributions have 3 equal moments of inertia, it also happens for other shapes (a cube being one of them, if I remember right).

You could calculate the density as a function of spherical coordinates, and then see how constant the density is for a given radius (or the integrated mass under some radius), as a function of the two angles. The first thing I would do is to make a plot of those quantities to see how flat the curves are, then start looking for measures of it (the standard deviation being the simplest one). It seems to me that the tricky part to calculate those things may be resolution issues, if the number of points you have is not very large.

Subject: Re: Measuring sphericity of a set of voxels.
Posted by [cgguido](#) on Fri, 28 Aug 2009 15:46:40 GMT
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Thanks for your reply pp!

- > Though spherical distributions have 3 equal moments of inertia, it
- > also happens for other shapes.

yeah, that is what i meant when I said there would be a better way.

- >
- > You could calculate the density as a function of spherical

- > coordinates, and then see how constant the density is for a given
- > radius (or the integrated mass under some radius), as a function of
- > the two angles. The first thing I would do is to make a plot of those
- > quantities to see how flat the curves are, then start looking for
- > measures of it (the standard deviation being the simplest one). It
- > seems to me that the tricky part to calculate those things may be
- > resolution issues, if the number of points you have is not very large.

Indeed it could be a problem since my blobs are about 3 or 4 pixels in diameter...

What about calculating the correlation between the blob brightness and the brightness of an ideal sphere "imaged" with no voxel noise? Could even do this twice: once for a solid sphere and once for a sphere with a gaussian distribution of brightness....

What do you think?

Thanks,
Gianguido
