Subject: Average outline of several contours
Posted by Beat.Schmutz on Fri, 21 Nov 2003 05:22:48 GMT
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I have combined 8 contours of bone cross-sections into one image
(individual ROIs in a IDLgrROIGroup). Now I like to determine the
path/outline which represents the average of these 8 contours. Is
anyone aware of a program/code/method that enables me to achieve this?
Any help would be greatly appreciated.

Beat Schmutz

Subject: Re: Average outline of several contours
Posted by K. Bowman on Fri, 21 Nov 2003 15:14:00 GMT
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In article <f40e34db.0311202122.37499b6@posting.google.com>,
Beat.Schmutz@flinders.edu.au (Beat Schmutz) wrote:

> I have combined 8 contours of bone cross-sections into one image
> (individual ROIs in a IDLgrROIGroup). Now I like to determine the
> path/outline which represents the average of these 8 contours. Is
> anyone aware of a program/code/method that enables me to achieve this?
> Any help would be greatly appreciated.
>
> Beat Schmutz

Assuming the contours are roughly circular, you could do this:

Compute the centroid (average position) of all the points in all the
contours.

Transform the contours to polar coordinates centered on the centroid.

Interpolate each contour to regularly spaced points in theta.

Average the radial values of the contours at each regular theta.

Transform back to Cartesion coordinates, if necessary.

The only tricky thing I see is doing the interpolation in theta across
the "seam" (where theta equals both 0 and 2 pi). That should be easy to
fix by rotating the coordinates by pi for points near the seam.

Ken Bowman

Subject: Re: Average outline of several contours
Posted by Beat.Schmutz on Sun, 23 Nov 2003 11:42:41 GMT
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> Assuming the contours are roughly circular, you could do this:

The contours are roughly circular for the shaft region of the bone but
not for the ends (condyles). Sorry, I should have mentioned that in
my original posting.

>
> Average the radial values of the contours at each regular theta.

Thanks for your suggestion, I'll keep it in mind.

Cheers,

Beat

Subject: Re: Average outline of several contours
Posted by Craig Markwardt on Sun, 23 Nov 2003 20:19:09 GMT
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Beat.Schmutz@flinders.edu.au (Beat Schmutz) writes:

>> Assuming the contours are roughly circular, you could do this:
>
> The contours are roughly circular for the shaft region of the bone but
> not for the ends (condyles). Sorry, I should have mentioned that in
> my original posting.

Personally, I think averaging in contour space is a problem. Contours
are sensitive to any little fluctuation in the underlying image. For
example, a noise fluctuation in a single pixel might produce small
extra contour loops.

Instead, I would say you should add the underlying images together,
and then find the master contour from the mean image.

Good luck!
Craig

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Craig B. Markwardt, Ph.D. EMAIL: craigmnet@REMOVEcow.physics.wisc.edu

Subject: Re: Average outline of several contours
Posted by Beat.Schmutz on Tue, 25 Nov 2003 03:44:00 GMT
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> Personally, I think averaging in contour space is a problem. Contours
> are sensitive to any little fluctuation in the underlying image. For
> example, a noise fluctuation in a single pixel might produce small
> extra contour loops.
>
> Instead, I would say you should add the underlying images together,
> and then find the master contour from the mean image.
>
> Good luck!
> Craig

Thanks Craig.

Beat