Subject: Re: Registration of 3D shells?
Posted by anne.martel on Fri, 17 May 2002 09:35:34 GMT
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The registration of 2 surfaces is quite a common problem in medical image registration. One sucessful approach is that proposed by Charles Pelizzari (JCAT, 1989, 13:20-26) where you try to fit one surface on top of the other like fitting a hat on a head. The most efficient way to do this is to generate a distance map (sometimes called a chamfer map) using one surface and then rotate the other surface so that the distance between any point on the rotated surface and the stationary surface is minimised. You usually only need to calculate the distance for a subset of the surface points. The only problem with the algorithm is that it can converge to a local minimum (like putting on the hat back to front)

Anne

"Dick Jackson" <dick@d-jackson.com> wrote in message news:<3cQE8.82791$GG6.7187426@news3.calgary.shaw.ca>...
> "Craig Markwardt" <craigmnet@cow.physics.wisc.edu> wrote in message
> news:onptzxkpqu.fsf@cow.physics.wisc.edu...
>>
>> "Dick Jackson" <dick@d-jackson.com> writes:
>>
>>> Hi all,
>>>
>>> I'd like to know if anyone has any experience to share on registration
> of 3D
>>> shells. That is, if you have two IDLgrPolygons (or Surfaces) that are
>>> 'snapshots' of the surface of an object, which:
>> ...
>>
>> Hi Dick--
>>
>> Are these 2d or 3d data sets? When you say surface that could be an
>> isosurface within a 3d data volume, or simple the surface z = f(x,y)
>> of a 2d data set.
>>
>> I think registration of 2d data sets is commonly done with a cross
>> correlation.
>
> Yes, they are generally like a z = f(x,y) surface, in that a surface doesn't
> wrap around behind itself. With some datasets we have regular (x,y),
> sometimes not.
>
> As I understand it, cross correlation could find the best x-y translation

> with regular (x,y), but we have rotation and translation in 3D to contend
> with. My solution will need 6 parameters, can cross correlation help out
> here?
>
> Thanks for your interest!
>
> Cheers,
