Subject: Re: polar interpolation
Posted by James Kuyper on Mon, 13 Jan 2003 17:40:05 GMT
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Stein Vidar Hagfors Haugan wrote:
>
> James Kuyper <kuyper@saicmodis.com> writes:
>
>> Thomas Gutzler wrote:
>>>
>>> Good morning,
>>>
>>> I am looking for a function that can do a polar interpolation of a
>>> [2,n]-array.
>>> What I don't want is to convert polar koordinates to rect, interpolate,
>>> and reconvert them to polar.
>>
>> If you have data that comes close to the pole, that's precisely what you
>> should do. Otherwise, you're going to see some very bizarre results in
>> that vicinity. The pole is a singular point in that coordinate system,
>> and you can only approach it by using a coordinate system where it isn't
>> a singular point.
>>
>> If you don't come close to the pole, you should be able to use ordinary
>> interpolation routines, treating rho, theta as if they were x and y.
>> That won't produce exactly the right results, but anything that produces
>> exactly the right results is going to be mathematically equivalent to
>> converting back to rectangular coordinates.
>
> Wouldn't it be better to do the interpolation close to the pole in a
> rotated (i.e. translated) polar coordinate system? Tilt the polar axis
> by 90 degrees, interpolate, tilt back?

That would work, but it has no advantages over converting to rectangular coordinates, and it has the disadvantage of treating near-polar data differenently from other data. The conversion from polar coordinates with one pole to polar coordinates with a different pole is no simpler than the conversion to rectangular coordinates. In fact, the easiest way to do the conversion is to use rectangular coordinates as an intermediate step. Rotation around a polar axis is simple; moving the polar axis is not.

--
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