Subject: Re: Averaging quaternions
Posted by jelansberry on Sat, 20 Mar 2004 15:23:03 GMT
View Forum Message <> Reply to Message

I've finally realized that all I contributed was questions and complaints and no alternative solutions.

If I were doing this, I would probably convert the quaternions to Euler (or Bryant) angles first (convert the quaternion to a direction cosine matrix, then extract the Euler angles). Then, I would compute the average of the Euler angles, and then convert the resulting average Euler angles back to a quaternion (convert the Euler angles to a direction cosine matrix, then extract the quaternion).

The only thing you have to worry about with Euler (or Bryant) angles is that there will always be a singularity for any chosen sequence. For example, if you choose a 3-2-1 Bryant sequence (i.e., first rotation about the 3-axis, second rotation about the subsequent 2-axis, third rotation about the subsequent 1-axis) then there will be a singularity whenever the second rotation angle is an odd multiple of 90 degrees (in that case, there is no unique solution for the first and third rotation angles). However, you can always look at the data and select an Euler (or Bryant) sequence that has no singularity.

John

"Graham" <GrahamWilsonCA@yahoo.ca> wrote in message news:eda30d78.0403181434.229b3b53@posting.google.com...
> Does anyone know if it is possible to take an average of regularly
> sampled quaternions to get a mean orientation (i.e. a mean rotation
> matrix)? I seem to recall there being a trick involved but beyond
> re-normalizing the resuling (averaged) quaternion, I cannot remember
> what it is.
>
> Cheers,
> Graham