Subject: Re: Averaging quaternions
Posted by Craig Markwardt on Thu, 18 Mar 2004 23:39:43 GMT

GrahamWilsonCA@yahoo.ca (Graham) writes:

> 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.

I am sure I will be scolded by somebody, but I believe that you can
average the quaternion components, and then normalize as you say.
This is assumes that you are noise dominated.

Also, there is one trick that I can think of, which is that
quaternions are degenerate. For each unique rotation, there are two
possible quaternions whose components have opposite signs. This is
because a positive rotation about axis V is identical to a negative
rotation about axis -V.

If your system is capable of both signs indiscriminately, then you
must make the sign conventions uniform. For example, by always making
one component positive.

Some advertising since you crossposted on the IDL newsgroup: I do have
a fairly comprehensive quaternion IDL library on my web page.

Craig

P.S.   http://cow.physics.wisc.edu/~craigm/idl/idl.html   (under Math)

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