Subject: Re: Distance calculation for lots of stars
Posted by Jeremy Bailin on Thu, 16 Jul 2015 16:08:16 GMT
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On Monday, July 13, 2015 at 2:49:37 PM UTC-4, matthewp...@gmail.com wrote:
> On Monday, July 13, 2015 at 2:36:32 PM UTC-4, wlandsman wrote:
>> A couple of comments:
>>
>> You are not using the correct formula for the distance on a sphere. (Near the pole, stars can have very different right ascensions but be separated by less than an arc second.)
>>
>> If stars are separated by more than 1 arc second in declination, then they must be more than 1 arc second apart. So a first step is to just search in declination, and you only need the full distance computation when the declination differs by less than 1 arc second.
>>
>> Jeremy Bailin's program matchall_sph.pro uses many such tricks to speed up the processing. It is available in his tar file jib-1.2.tgz available from
>> http://www.simulated-galaxies.ua.edu/jbiu/ --Wayne
>>
>
> Thanks Wayne, I'm looking at matchall now.
>
> I apologize, I didn't note that I have already taken into account the position on the sphere. The code I posted is a gross over generalization of the bigger picture!
>
> I've run into some issues with very close stars but the reduction comes later anyway. I'll implement the declination change and check that against matchall.
>
> Matthew

Even if you're dividing out by cos(dec) (which is my guess from what you're saying), you're still going to get the wrong answer near the pole. But the short answer is that you should use matchall_sph (or match_sph if you only want the closest match) -- it uses a lot of tricks to make things orders of magnitude faster, so it is worth your time to get it working for you.

-Jeremy.