Subject: Re: fast search
Posted by greg michael on Tue, 17 Oct 2006 17:17:57 GMT
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Actually, there's a mistake in that code - it's got mixed
procedure/function syntax. Should be like this:

```
function ss_MakeGalaxies,n
 p=replicate({x:0.,y:0.,z:0.},n)
 seed=0
 p.x=randomu(seed,n)*1000.
 p.y=randomu(seed,n)*1000.
 p.z=randomu(seed,n)*1000.
 return,p
end

function ss_distance,p1,p2
 return,sqrt((p2.x-p1.x)^2+(p2.y-p1.y)^2+(p2.z-p1.z)^2)
end

pro splitsearch,p,dist
 ;recursively splits the search volume into n_split^3 subvolumes. When
 ;there are fewer than 'threshold' points
 ;in a subvolume, checks for matches the brute force way - every point
 ;against every other.

 n_split=3
 threshold=75

 s=(size(p))[1]

 if s gt threshold then begin
  xmn=min(p.x,max=xmx)
  ymn=min(p.y,max=ymx)
  zmn=min(p.z,max=zmx)

  xg=xmn+findgen(n_split+1)*(xmx-xmn)/n_split ;grid boundaries
  yg=ymn+findgen(n_split+1)*(ymx-ymn)/n_split
  zg=zmn+findgen(n_split+1)*(zmx-zmn)/n_split

  for j=0,n_split-1 do begin
   for k=0,n_split-1 do begin
    for l=0,n_split-1 do begin
     w= where(  (p.x ge xg[j]-dist) and (p.x lt xg[j+1]+dist) and $
              (p.y ge yg[k]-dist) and (p.y lt yg[k+1]+dist) and $
                    (p.z ge zg[l]-dist) and (p.z lt zg[l+1]+dist))
     if n_elements(w) ge 2 then begin
      splitsearch,p[w],dist
```

```
    endif
   endfor
  endfor
 endfor

endif else begin
 for i=0,s-2 do begin
  for j=i+1,s-1 do begin
   if ss_distance(p[i],p[j]) le dist then begin
    print,p[i],p[j]
   endif
  endfor
 endfor
endelse
end
```

Then call it using:

```
IDL> p=ss_MakeGalaxies(1e5)
IDL> splitsearch,p,.5
{     454.665      175.794      87.0097}{     454.816      175.504
  87.3471}
{     556.761      981.076      933.809}{     556.654      980.922
  934.065}
{     981.340      196.286      105.551}{     981.387      196.102
  105.703}
```

The left and right columns are the neigbouring (< .5 units distant) xyz triples.

regards,
Greg