Subject: New Fast Kriging Semivariogram Spherical Model Incorrect?
Posted by David Fanning on Wed, 16 Oct 2013 14:10:21 GMT
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Folks,

I have been writing a new cgKrig2D function for my own use that provides orders of magnitude faster kriging for general use than the (extremely!) slow Krig2D function that is supplied with all currently released versions of IDL. In doing so, I have come to believe that the Spherical modeling function in both the old version of Krig2D and in the new version Chris released here last week is incorrect.

I base my conclusion on the mathematical models described here:

http://help.arcgis.com/en/arcgisdesktop/10.0/help/index.html #//009z00000076000000.htm

The original version of the spherical mathematical model used this code:

```
r = d/t[0]
v = t[1] + t[2] * (r * (1.5 - 0.5 * r *r) > 0)
z = where(d eq 0, count)
if count ne 0 then v[z] = 0
return, (t[1] + t[2]) - v
```

Chris believed this to be wrong, and offered this code in the new, faster, version:

```
r = d/t[0] < 1
v = t[2]*(1 - r*(1.5 - 0.5*r*r))
v[WHERE(r eq 0, /NULL)] = t[1] + t[2]
return, v
```

This also appears to be incorrect to me. I think the correct version is something like this:

```
r = d/t[0]
v = t[2]*(1 - r*(1.5 - 0.5*r*r)) + t[1]
v[WHERE(d eq 0, /NULL)] = 0
v[WHERE(d gt t[0], /NULL)] = t[1] + t[2]
return, v
```

What think you experts?

Cheers,

David

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Coyote's Guide to IDL Programming: http://www.idlcoyote.com/
Sepore ma de ni thue. ("Perhaps thou speakest truth.")