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Subject: Create DXF file out of vertices and connectivities

Posted by [Tukee10](#) on Fri, 25 Jun 2004 21:25:47 GMT

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Hello,

I have following problem: I created the mesh structure of a volume with INTERVAL\_VOLUME, which gives me vertices (3,n) and connectivities (1,m). When I display it with XOBJVIEW, I get a wonderful 3d structure. How do I create a DXF file that contains the mesh structure ?

I know that it works with an IDLffDXF object. I tried that with following code:

```
ptr_verts = ptr_new(Verts)
ptr_conn = ptr_new(Conn)
```

```
oDXF = OBJ_NEW('IDLffDXF')
poly = {IDL_DXF_POLYGON}
poly.vertices = ptr_verts
poly.connectivity = ptr_conn
poly.dxf_type = 10
```

```
oDXF->PutEntity, poly
IF (not oDXF->Write('Mesh_Model.dxf')) THEN PRINT, 'Write Failed.'
OBJ_DESTROY, oDXF
```

It creates a DXF file, but when I open the file with AutoCAD, it seems to connect all the point in a strange way.  
Is there anyone who has an idea ?

Thanks,

Tukee.

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Subject: Re: Create DXF file out of vertices and connectivities

Posted by [Karl Schultz](#) on Mon, 28 Jun 2004 17:04:54 GMT

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"Tukee10" <turgutkaracay@hotmail.com> wrote in message  
news:e6feeb9d9fa4d9dad40235e15f6ab40b@localhost.talkaboutprogramming.com...

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> It creates a DXF file, but when I open the file with AutoCAD, it seems to
> connect all the point in a strange way.
> Is there anyone who has an idea ?

```

INTERVAL\_VOLUME returns a list of vertices and a connectivity list that represents tetrahedra (3D pyramid-like objects). If you used this vertex list and this connectivity list to create an IDLgrPolygon that you then displayed in XOBJVIEW, you should have seen quite a mess - or you got very lucky.

You should use TETRA\_SURFACE to create a polygonal surface from the tet mesh that you can then display in XOBJVIEW and put into DXF.

So, if INTERVAL\_VOLUME returns Verts and Conn, then

```
NewConn = TETRA_SURFACE(Verts, Conn)
```

```
XOBJVIEW, OBJ_NEW('IDLgrPolygon', Verts, POLYGONS=NewConn....
```

```
ptr_verts = ptr_new(Verts)
ptr_conn = ptr_new(NewConn)
```

```
oDXF = OBJ_NEW('IDLffDXF')
poly = {IDL_DXF_POLYGON}
poly.vertices = ptr_verts
poly.connectivity = ptr_conn
poly.dxf_type = 10
```

```
oDXF->PutEntity, poly
```

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Subject: Re: Create DXF file out of vertices and connectivities  
 Posted by [Tukee10](#) on Mon, 28 Jun 2004 17:50:22 GMT  
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Thank you for your response.

I forgot to add, that I'm using TETRA\_SURFACE to display in XOBJVIEW, which worked quite well. It displays the mesh structure I want, but when I write a DXF file, the mesh looks weird when I open it with AutoCAD. Is IDL\_DXF\_POLYGON the right structure format, if yes, does the DXF\_TYPE has to be 10 and are there other parameters to consider ?

Thanks,

Tukee.

---

Subject: Re: Create DXF file out of vertices and connectivities

Posted by [Dick Jackson](#) on Tue, 29 Jun 2004 06:15:27 GMT

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"Karl Schultz" <[kschultz\\_no\\_spam@rsinc.com](mailto:kschultz_no_spam@rsinc.com)> wrote in message news:<[10e0jrc69hn5715@corp.supernews.com](mailto:10e0jrc69hn5715@corp.supernews.com)>...

>  
> "Tukee10" <[turgutkaracay@hotmail.com](mailto:turgutkaracay@hotmail.com)> wrote in message  
>  
> news:[e6feeb9d9fa4d9dad40235e15f6ab40b@localhost.talkaboutpro gramming.com](mailto:e6feeb9d9fa4d9dad40235e15f6ab40b@localhost.talkaboutprogramming.com)...

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[...]

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> lucky.

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news:2d0234904ddaf48a12f5006bb0ae4bdb@localhost.talkaboutprogramming.com...

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> IDL\_DXF\_POLYGON the right structure format, if yes, does the DXF\_TYPE  
has  
> to be 10 and are there other parameters to consider ?

Hi Tukee, Karl,

I tried this out too, and indeed it seems the file is mucked up. It does  
look like a DXF writing bug to me. If you want to look further, here's  
what I did:

=====

PRO WriteDXFTest

:: From online help for Interval\_Volume

```
RESTORE, FILEPATH('clouds3d.dat', $  
  SUBDIRECTORY=['examples','data'])  
INTERVAL_VOLUME, rain, 0.1, 0.6, verts, conn  
conn = TETRA_SURFACE(verts, conn)  
; oRain = OBJ_NEW('IDLgrPolygon', verts, POLYGONS=conn, $  
;   COLOR=[255,255,255], SHADING=1)  
; XOBJVIEW, oRain, BACKGROUND=[150,200,255]
```

:: Simplify mesh

```
ntri=mesh_decimate(verts,conn,connout,vertices=vertsdec,percent_poly=10)  
verts=vertsdec  
conn=connout
```

:: From Tukee10

```
ptr_verts = ptr_new(Verts)  
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oDXF = OBJ_NEW('IDLffDXF')  
poly = {IDL_DXF_POLYGON}  
poly.vertices = ptr_verts  
poly.connectivity = ptr_conn  
poly.dxf_type = 10
```

```
oDXF->PutEntity, poly
IF (not oDXF->Write('Mesh_Model.dxf')) THEN PRINT, 'Write Failed.'
OBJ_DESTROY, oDXF
```

:: Try it out

```
oModel = Get_DXF_Objects('Mesh_Model.dxf')
oDXFRead = oModel -> Get(/All) ; IDLgrPolygon
oModel -> Remove, /All
XObjView, oDXFRead
```

```
END ; WriteDXFTest
```

=====

... it looks like mostly-correct points are being joined up in a haphazard way, with a lot of joining of points in sequence along x and y.

Are we missing something in the DXF writing?

Cheers,

--

-Dick

Dick Jackson / dick@d-jackson.com  
D-Jackson Software Consulting / http://www.d-jackson.com  
Calgary, Alberta, Canada / +1-403-242-7398 / Fax: 241-7392

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Subject: Re: Create DXF file out of vertices and connectivities  
Posted by [Dick Jackson](#) on Tue, 29 Jun 2004 06:38:25 GMT  
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[Please ignore my previous post, I improved my testing code for clarity]

"Karl Schultz" <kschultz\_no\_spam@rsinc.com> wrote in message  
news:<10e0jrc69hn5715@corp.supernews.com>...

>

> "Tukee10" <turgutkaracay@hotmail.com> wrote in message

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SUBDIRECTORY=['examples','data'])
INTERVAL_VOLUME, rain, 0.1, 0.6, verts, conn
```

```

conn = TETRA_SURFACE(verts, conn)
; oRain = OBJ_NEW('IDLgrPolygon', verts, POLYGONS=conn, $
;   COLOR=[255,255,255], SHADING=1)
; XOBJVIEW, oRain, BACKGROUND=[150,200,255]

```

```

;; Simplify mesh

```

```

ntri=mesh_decimate(verts,conn,connout,vertices=vertsdec, $
    percent_poly=10)
verts=vertsdec
conn=connout

```

```

polyColor = [255, 0, 0]
dxfFile = 'Mesh_Model.dxf'
XObjView, Obj_New('IDLgrPolygon', verts, Polygons=conn, $
    Color=polyColor), $
    Title='IDLgrPolygon Made From Raw Data'

```

```

;; From Tukee10

```

```

ptr_verts = ptr_new(Verts)
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```

```

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```

```

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OBJ_DESTROY, oDXF

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;; Try it out

```

```

oModel = Get_DXF_Objects(dxfFile)
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```

```

;; Vert_Colors are all black, change color to
;; something more visible
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XObjView, oDXFRead, Title='Read From DXF File'

```

```

END ; WriteDXFTest

```

```

=====

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Subject: Re: Create DXF file out of vertices and connectivities

Posted by [Karl Schultz](#) on Tue, 29 Jun 2004 21:26:33 GMT

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"Dick Jackson" <dick@d-jackson.com> wrote in message  
news:B78Ec.933959\$0R5.650290@pd7tw3no...

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```

```

> polyColor = [255, 0, 0]
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> XObjView, Obj_New('IDLgrPolygon', verts, Polygons=conn, $
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>     Title='IDLgrPolygon Made From Raw Data'
>
> ;; From Tukee10
>
> ptr_verts = ptr_new(Verts)
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> =====
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> y.
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> Are we missing something in the DXF writing?
>

```

Well, yes and no.

A dxf\_type code of 10 is DXF FACE3D, which is a 4-vertex polygon. I think that IDL will still try to write FACE3D entities if you use this code even though your data isn't arranged this way. This will lead to incorrect, or

at least, unintended output in your dxf file. The DXF heart example that ships with IDL contains FACE3D entities, and this might lead some to try to use this code to write entities. I think that if you had a bunch of 4-vertex polygons, a code of 10 would work.

You can try a code of 9 (polygon). Yes, I know that the IDL docs don't say that 9 is valid for a IDL\_DXF\_POLYGON structure, but it is. IDL actually ends up generating DXF POLYLINE entities with the appropriate settings to indicate that it is a polyface mesh.

That being said, if you use code 9, IDL will run your polygons through the tessellator. I believe that this is done to make sure that the mesh is a simple triangle mesh that is appropriate for the DXF polyface mesh. The trouble is that your output from ISOSURFACE, INTERVAL\_VOLUME/TETRA\_SURFACE, and many other routines are already lists of triangles. Running them through the tessellator is not necessary and in fact can mess up the mesh. I'm not sure right now why the mesh gets corrupted. I'm looking in to it. IDL should really avoid the tessellation if it can. (We have an open problem report related to this)

Karl

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