

Comp3000 Project

OpenDX

Mincom MineScape

A Comparison

October 18th 2004

A Comparison

- Fair Comparison
 - Same Data set
 - Same interpolation method (triangles)
 - Same display requirements (Coloured based on height, Caption and Legend)
- Tools
 - Speed
 - Usability
 - Display accuracy

OpenDX

- Visualisation Package
- Open Source
- IBM's Visualisation Data Explorer (1991)
- Became Open Source to attract developer community creativity
- Current Version: 4.3.2

Mincom MineScope

- 1979 – Mincom's first product
- Idea of two Mining Engineers
- Sponsorship of BHP to begin product development
- Commercial Product since 1979
- Mining Specific
- Current Version 4.115

OpenDX Features

- GUI Interface –
 - Direct Interactors eg Zoom and Rotate
 - Indirect Interactors eg Slide Bars
- Polymorphic Modules eg Compute, which performs several functions
- Object Orientated Self Describing Data Model
- Client/Server environment

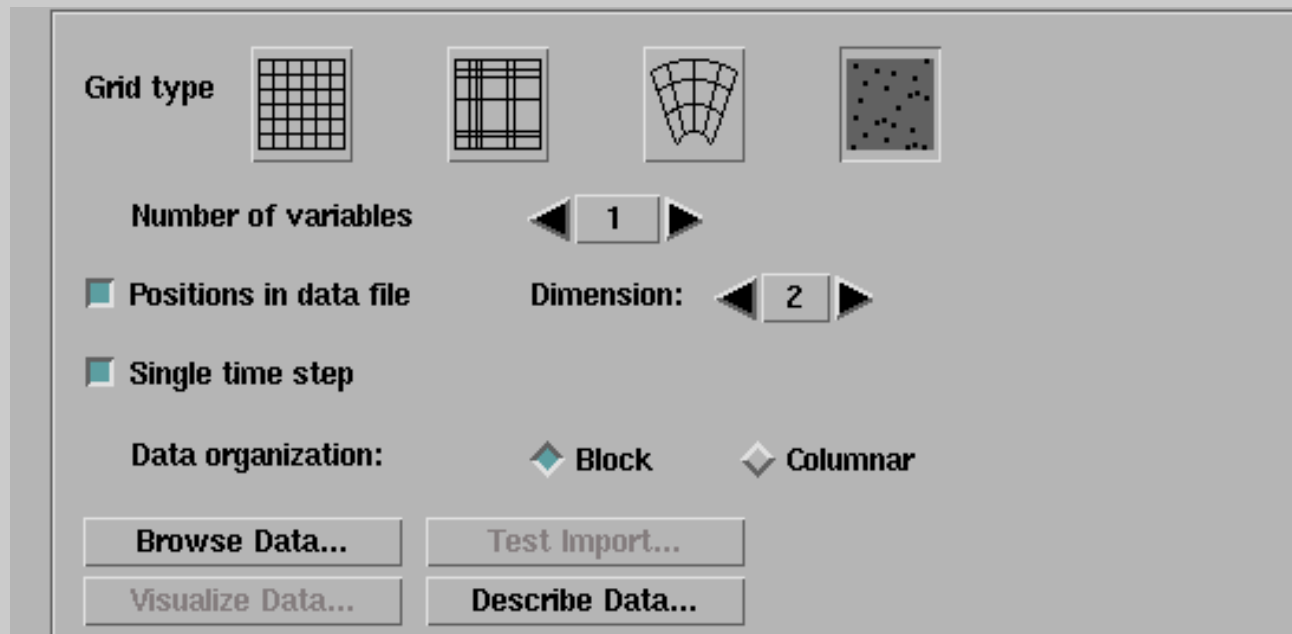
MineScape Features

- GUI
- CAD
- Multi processor
- Etc etc

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Import Data – OpenDX

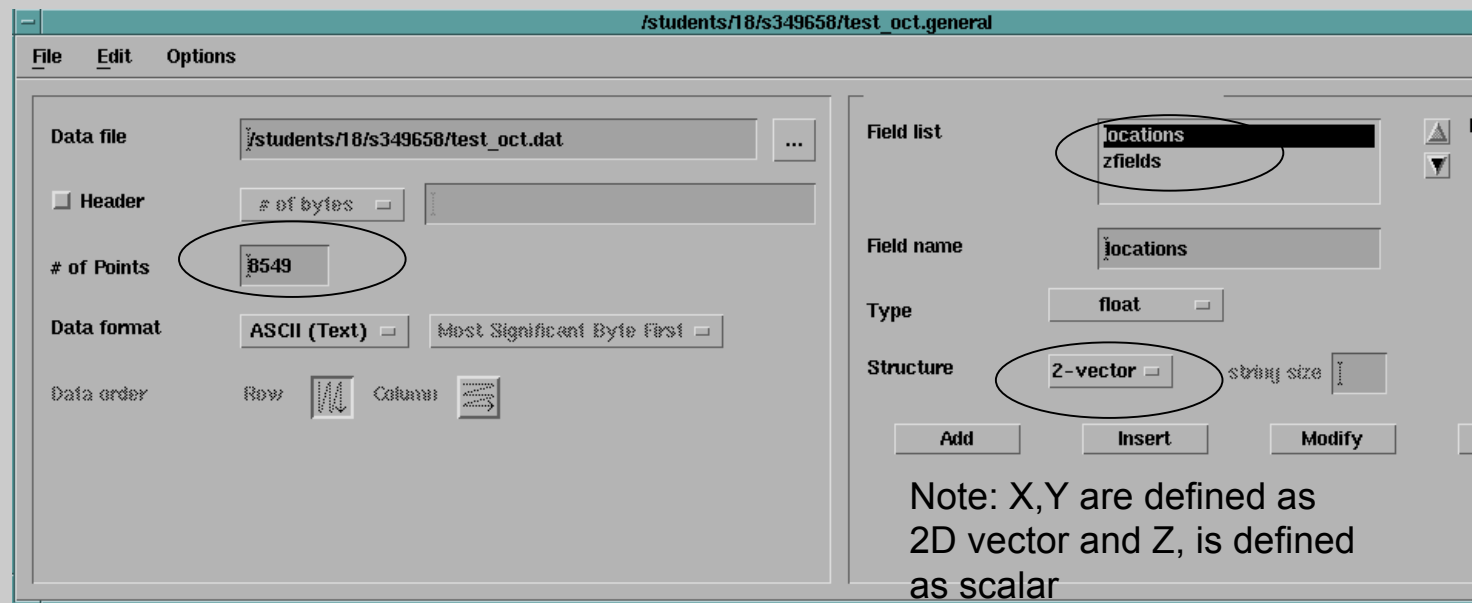
- View ASCII data - X, Y, Z
- General File – Scattered Data




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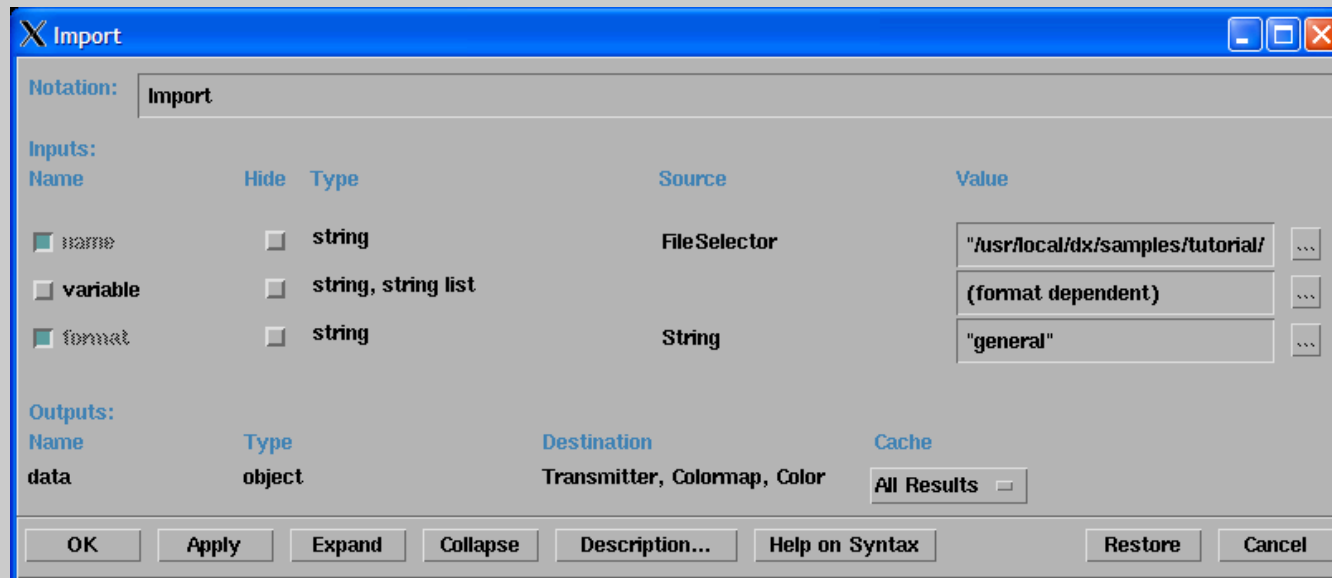
OpenDX - Import

- General File



OpenDX

- General File is read by  function in OpenDX

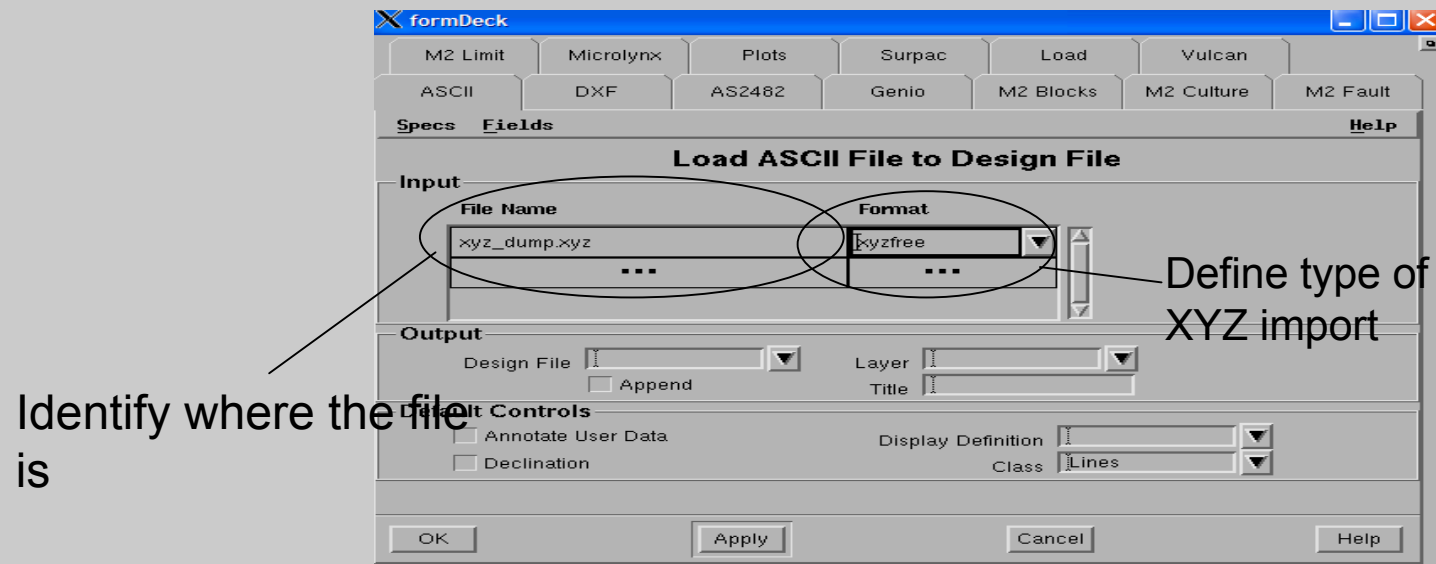


OpenDX

- Advantages
 - Simple GUI interface
 - Feedback Screen
 - Many formats accepted
 - Easy intuitive access
- Disadvantages
 - Data Format must be known
 - Number of Data must be known
 - Several steps to achieve import

Mincom MineScape

- Identify where to import file (MineScape explorer)
- Identify where the data file is



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MineScape

- Define the XYZ format

Feature Format Spec

Format

Name: xyzfree

Field Definitions

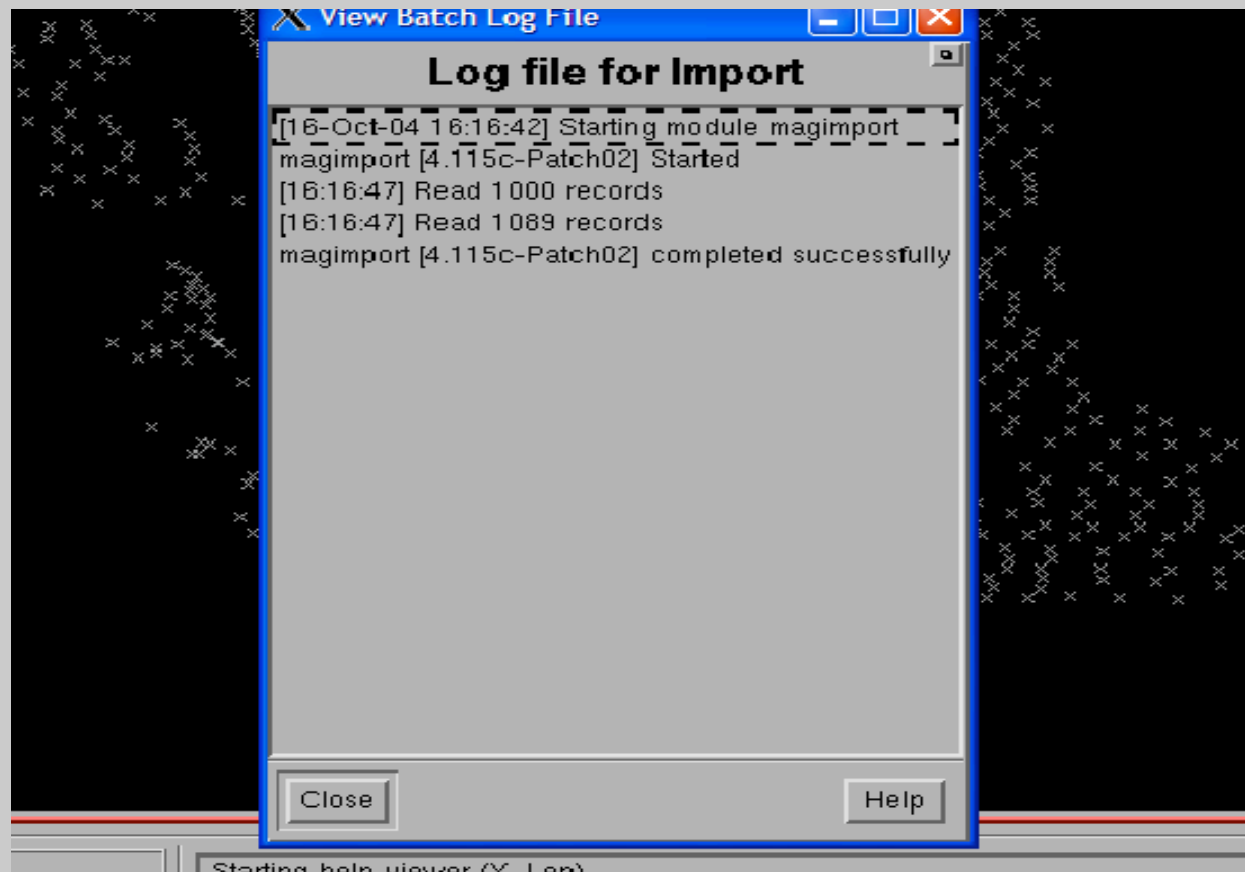
Fixed Field	Start	Length/Token	
<input type="checkbox"/> Easting	1	1	
<input type="checkbox"/> Northing	1	2	
<input type="checkbox"/> Elevation	1	3	
<input type="checkbox"/> Relative			
<input type="checkbox"/> Relative ID			ID Character/s
<input type="checkbox"/> Declination			
<input type="checkbox"/> Azimuth			
<input type="checkbox"/> Horiz. Angle			
<input type="checkbox"/> Dip			
<input type="checkbox"/> Distance			
<input checked="" type="checkbox"/> Element Type			Type Mapping
<input type="checkbox"/> Layer			Layer Mapping
<input type="checkbox"/> Display			Display Mapping
<input type="checkbox"/> Break Field			<input type="checkbox"/> Include Breakline <input type="checkbox"/> Break on Blank Line
<input type="checkbox"/> User Data			
<input type="checkbox"/> Identifier			ID Character/s
<input type="checkbox"/> Continuation			

Cancel Help

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MineScape

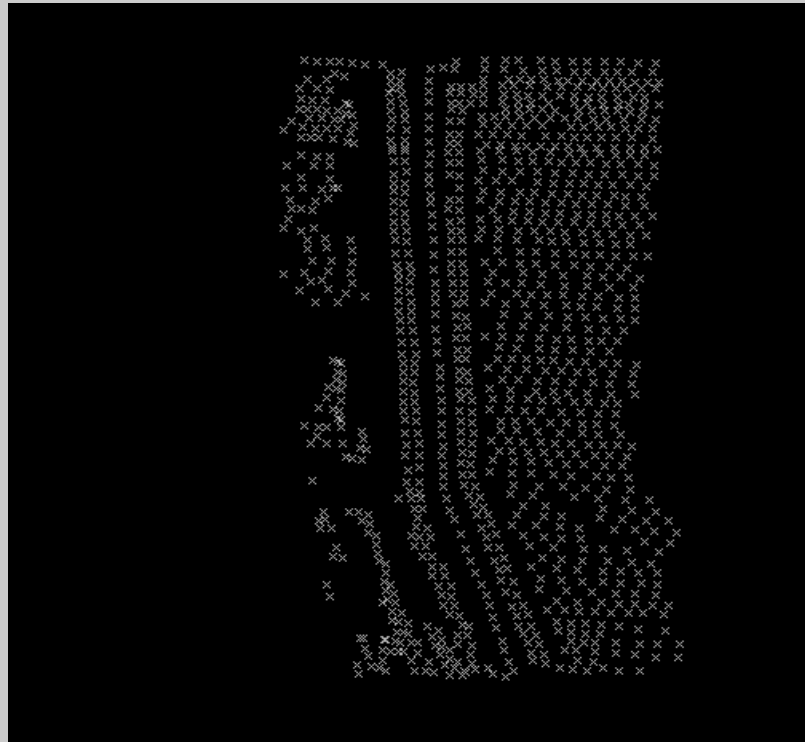
- Feedback Module



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MineScape

- Automatic Display in GUI



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MineScape

- Drill Down to find import functions
- Immediate Visualization – points come in for visualization, triangulate etc later
- Or import for specific interpolator (i.e grid, triangulation (similar to opneDX))
- Simple format choices
- Modular execution
- Feedback Window

A Comparison

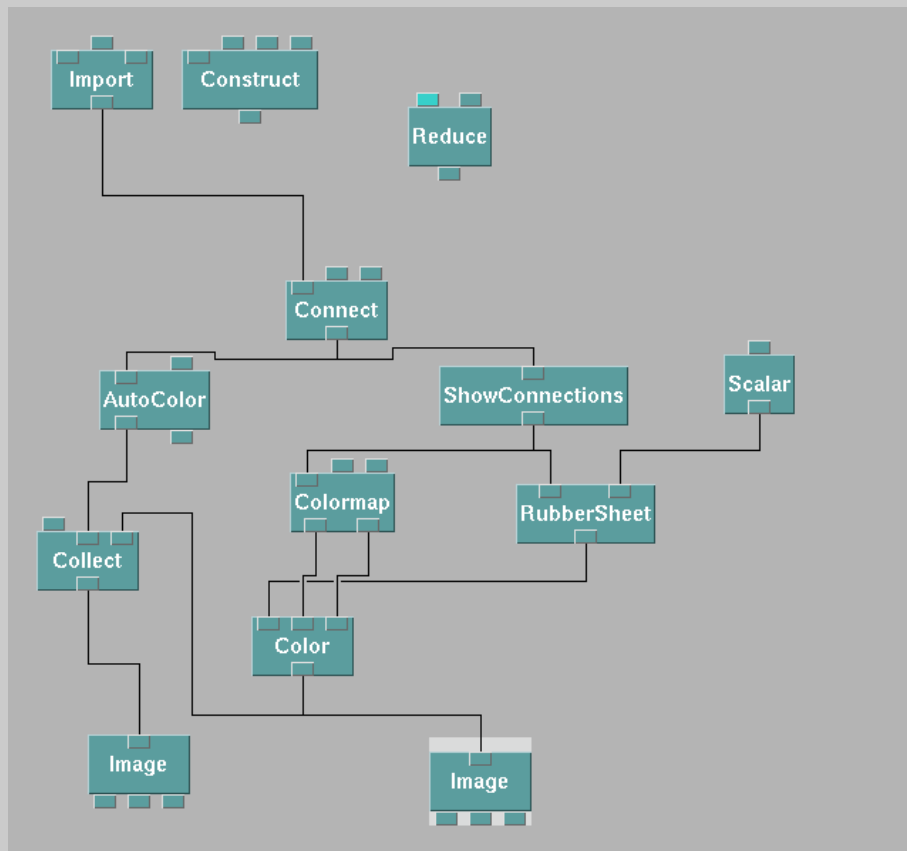
OpenDX		Mincom MineScape	
Advantages	Disadvantages	Advantages	Disadvantages
GUI Interface	Data Format must be known	Limited number of steps	Difficult to find import function
Many Formats accepted	Number of points must be known	GUI interface	
Feedback Screen	Several steps to achieve import	CAD Interface	
Easy intuitive access		Many formats accepted	
		Feedback module	

Displaying Data - OpenDX

- Data Flow Method (dropping modules onto a canvas)
- Data flow and transformation between modules indicated by line
- Separated into areas for improved logic
- Modules are numerous

Displaying Data - OpenDX

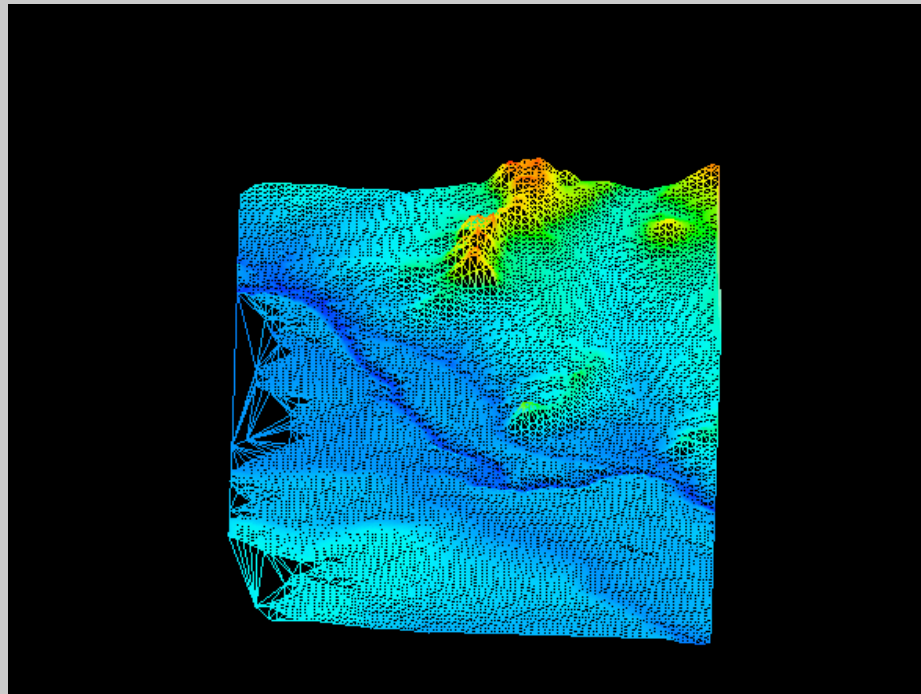
- Topo Network



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Displaying Data - OpenDX

- Resulting Image



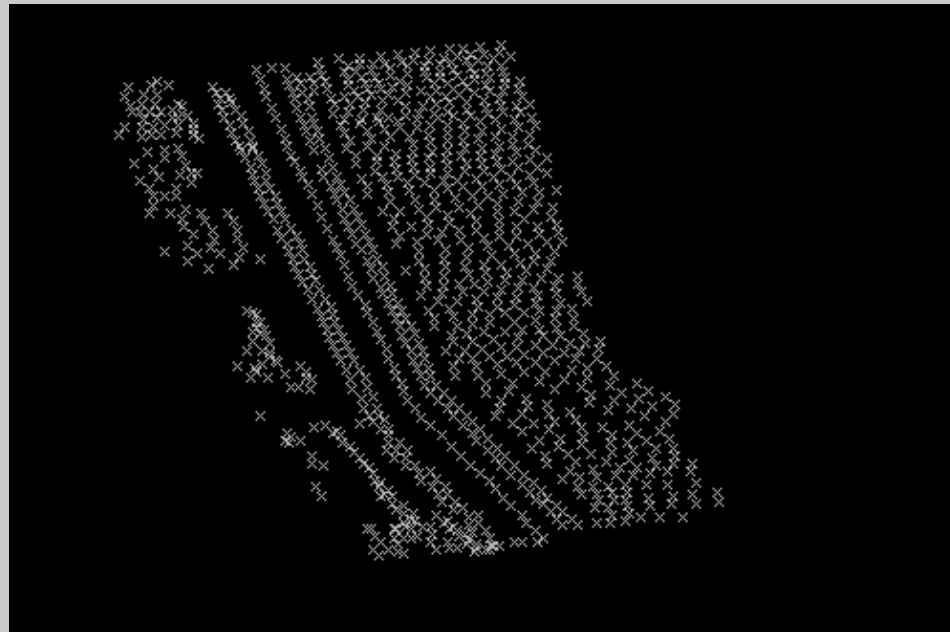
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Displaying Data - OpenDX

- Topography display not representative of topography and different to MineScape.
- Why?
 - The process of triangulating the data in 2D (X,Y) and then displaying the data in 3D may have lead to a mis – interpretation of the “variable” or Z co-ordinate.
 - The process of importing scattered data and then using the “connections” module to triangulate the data may not be the best approach in openDX, however, for a comparisons between MineScape and openDX could occur a common data process procedure occurred.
 - The triangulating algorithm used to interpret data in openDX may be different to that used in MineScape.

Displaying Data - MineScape

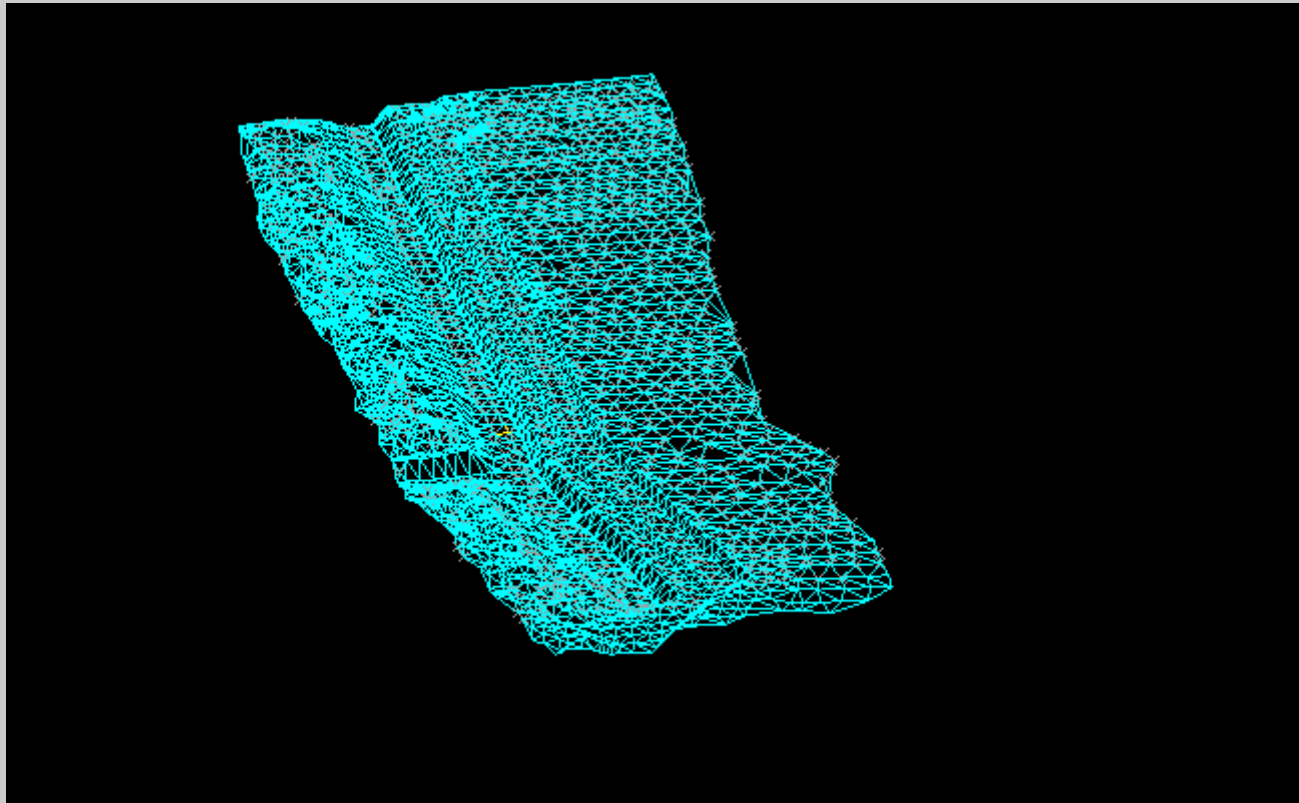
- Data displayed by points or
- Data directly triangulated and displayed as per user



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Displaying Data - MineScape

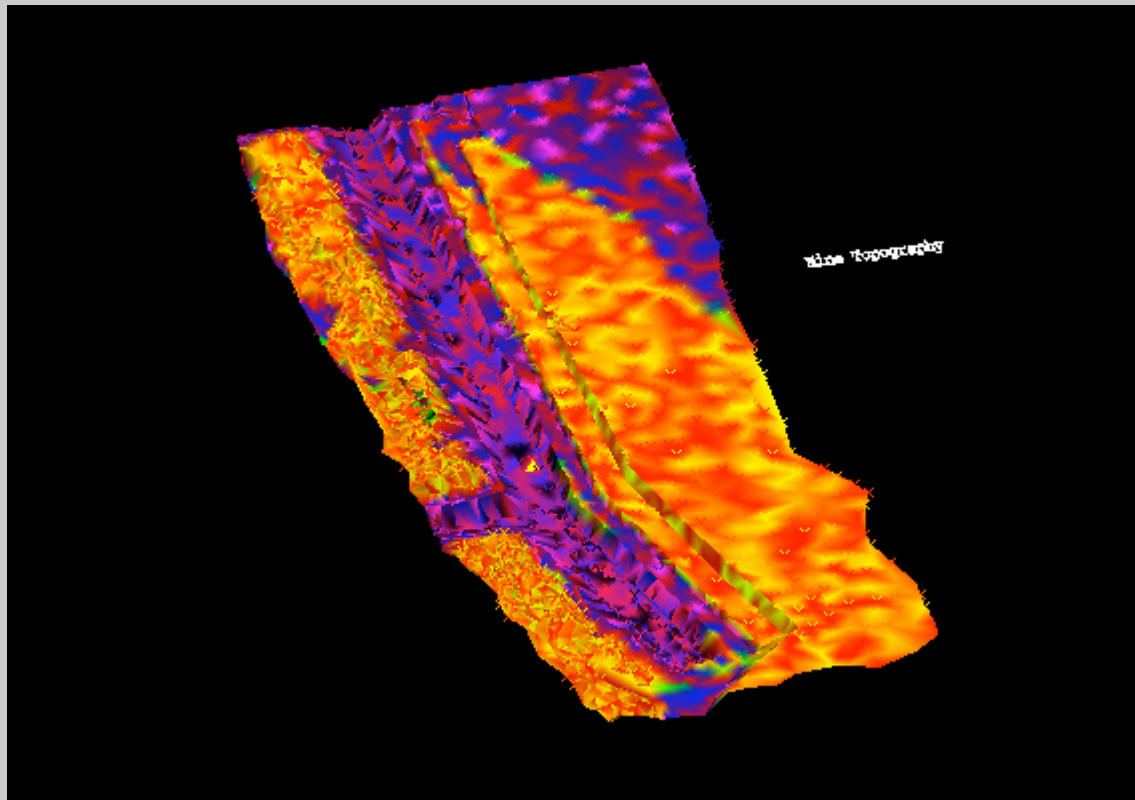
- Triangulating



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Displaying Data - MineScape

- Rendering, Adding text, lines etc



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Displaying Data - MineScape

- Advantages
 - CAD – Easy manipulation tools
 - Large variety of visualisation tools eg clipping planes, sectioning, rendering, fill patterns etc
- Disadvantages
 - Colour variation on rendering set and not user controlled
 - Not all tools are intuitive to the user – training required

A Comparison

OpenDX		MineScape	
Advantage	Disadvantage	Advantage	Disadvantage
Interactive controls – rotating, panning, zooming	Pre – planning of display required	CAD – interactive manipulation of data and triangulation	Not intuitive unless previous CAD experience
Animation	No interactive data manipulation	Animation	Colour for height assigned automatically
Colour height editing		Interactive controls – rotating, panning, zooming, sectioning	
		Layers allow for easy manipulation of different views	

A Comparison on Data Display

- The vast differences in the displays of the data could be for a variety of reasons including;
 - different triangulating techniques – triangulating a general 2D surface in 3 – space is not trivial, since there can be ambiguity
 - OpenDX's limitations in display of XYZ data
 - MineScape's industry specific software and hence, is better able to handle this type of data, which is quite common in the industry.

Question Raised: Would MineScape be able to handle non mining specific data i.e MRI scans...????

A Comparison

Answer: No!!!

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Displaying Data - Conclusions

- OpenDX is a generic visualization tool
- MineScape is mining specific and hence displayed the data more accurately
- The speed of the import process was faster in MineScape
- The visualisation tools in both were similar although MineScape, due to CAD, had better interactive tools