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INNOVAFUN

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Guide***

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1. Introduction

GeoDED Visualizer is an acronym to Open Visualizer for Geometry Data Encoded in DWG Format, a tool used to enable open visualization of product data geometry in Autodesk® DWG format.

The objective of visualisation is the improvement of information flow and communication throughout the product life cycle. It is an easy way to communicate complex geometry-based product information to non-CAD users.

Visualisation is not intended to replace or overlap CAD systems functionalities, moreover, it is not intended to replace actual CAD data exchanges but rather complement it in those cases where the data receiver does not need all the information and knowledge included in a rich CAD data model.

Visualisation data is destined for data consumer rather than for a data creator or updater. Visualisation data is to be considered as terminal data and, so, it cannot be re-imported in a CAD model

1.1. Target Audience

GeoDED Visualizer can be used by many different people, but it's more intended to non-CAD users that need to view the complex geometry-based product information without use a CAD system.

1.2. System Requirements

The only requirement of this tool is a computer running Microsoft Windows with java runtime installed.

1.3. Skill Requirements

There is no special skill required. Any person that follows this guideline can use the tool.

1.4. Conventions Used in this Guide

- **Click:** User should select the item with the cursor while depressing the left mouse button;
- **Double Click:** Same as the click, but with two followed depressions in the left mouse button;

2. Learning GeoDED Visualizer

The scope of GeoDED Visualizer is to enable an open visualization of product data geometry and the properties associated, initially represented in Autodesk® DWG format. The tool enables to import a DWG file, extract the encoded information, and display it to the user using the X3D open format.

To increase collaboration among CAD and non CAD experts, GeoDED Visualizer enables the user to associate extra-information to the original drawing. It does so, by aggregating the content of the drawings by colours, and enabling the association to each colour, a texture, a material, a part name, or a description

2.1. Usage Scenario

A possible scenario for this tool to make a difference is in the industry, in the case of product data exchange.

When a seller needs to make a catalogue of the available products, and the producer has the product geometry in CAD format, but there is no sense in exchange rich CAD information to make a catalogue, so this tool is used to make and X3D equivalent file, with part names and materials associated.

The information exchanged is the only information needed for that end, so the seller is now able to make the catalogue without the cost of the very expensive CAD tools.

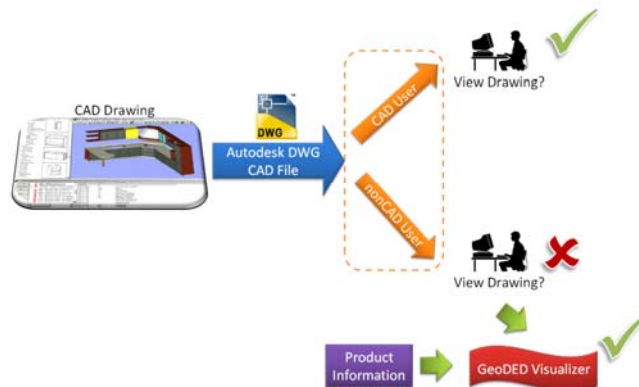


Figure 1 – Usage scenario.

2.2. Functionalities Available

The main functionalities of the tool are:

- Open drawings in Autodesk® DWG format;
- Visualize them in an integrated viewer;
- Export the drawing with extra-information associated to X3D XML Open format;

2.3. Standards Used

- ISO/IEC 19775:2004: this standard is used to create X3D objects;
- ISO/IEC 19776:2005: The generated XML output is compliant with this standard.

3. Getting Started

If it is the first time you are using GeoDED Visualizer, then you should follow the carefully the steps for the installation process before doing any other operation. If that is not the case, you skip section 3.1, and go directly to the user' guide to learn more how to use GeoDED Visualizer.

3.1. Installation Guide

This tool not requires installation. To run the tool is only necessary to have Microsoft Windows and check if java runtime is available.

3.1.1. Pre-installation checklist

The following items are needed to run this tool:

- Microsoft Windows;
- Java runtime;

Information on installation of java runtime can be found at <http://java.sun.com/javase/>

3.2. User's Guide

In this chapter, the user's will be instructed how to use all the parts of the tool, and it will be divided in the following items:

- Run GeoDED Visualizer;
- Get in touch with the interface;
- Open a Autodesk® DWG File;
- Associate extra-information to the drawing;
- Export drawing to X3D;

3.2.1. Run GeoDED Visualizer

To run this tool, is only need to execute the "GeoDEDVisualizer.bat" file that goes with the package.

3.2.2. Get in touch with the interface

After a successfully load of the tool, the following interface will appear:

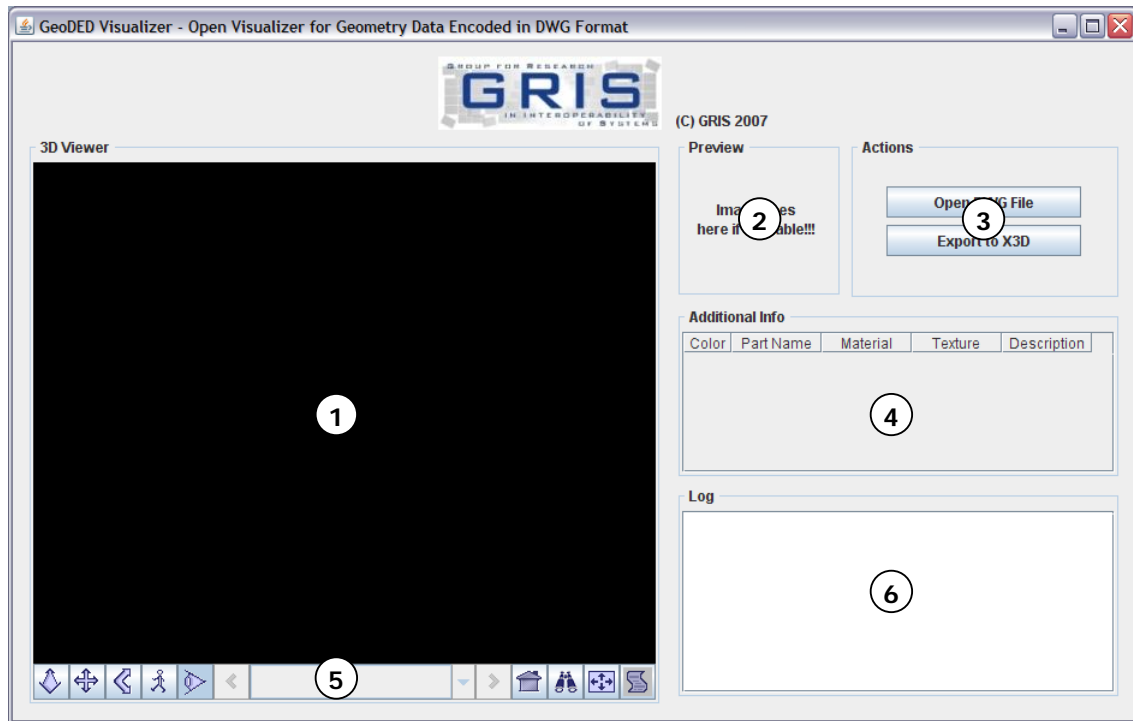


Figure 2 – GeoDED Visualizer interface.

The items that appear in the interface are:

1. **3D window** – In this part of the interface goes the 3D drawing of the model;
2. **Bitmap preview** – Here, goes the bitmap preview of the drawing, if it's available in the original file;
3. **Action panel** – When is needed to perform an action, open a file or export it, you have to choose the following buttons:








- This button has the purpose to open a new DWG file;
- In there you can export the file to X3D format;

4. **Additional info panel** – In there is possible to see the extra-information associated to the drawing, and change it;
5. **Navigation bar** – In here is located the buttons to interact with the 3D scene, with the following functionalities:



- Fly** – Allows the user to interact with the scene in fly mode;
- Pan** – Activates the pan mode;
- Tilt** – Enables the tilt interaction mode;
- Walk** – Has the goal for user to walk over the scene;

-  **Examine** – Rotates the scene by the start point of the drawing;
-  **Home** – Returns for the original viewpoint of the drawing;
-  **Look At** – Looks at selected point;
-  **Fit to World** – Put's the entire drawing in the window;
-  **Console** – Shows the browser console;

6. **Log window** – This is the place where the log of what's happening is written;

3.2.3. Open a Autodesk® DWG File

To open a cad drawing described in Autodesk® DWG file format, the only action needed to do is to, in the "Action Panel" click in the "Open DWG File" button.

Then the next step is choose the drawing from the file chooser dialog, then, click open and the file is ready to proceed.

The result of an open DWG file is described in the following picture:

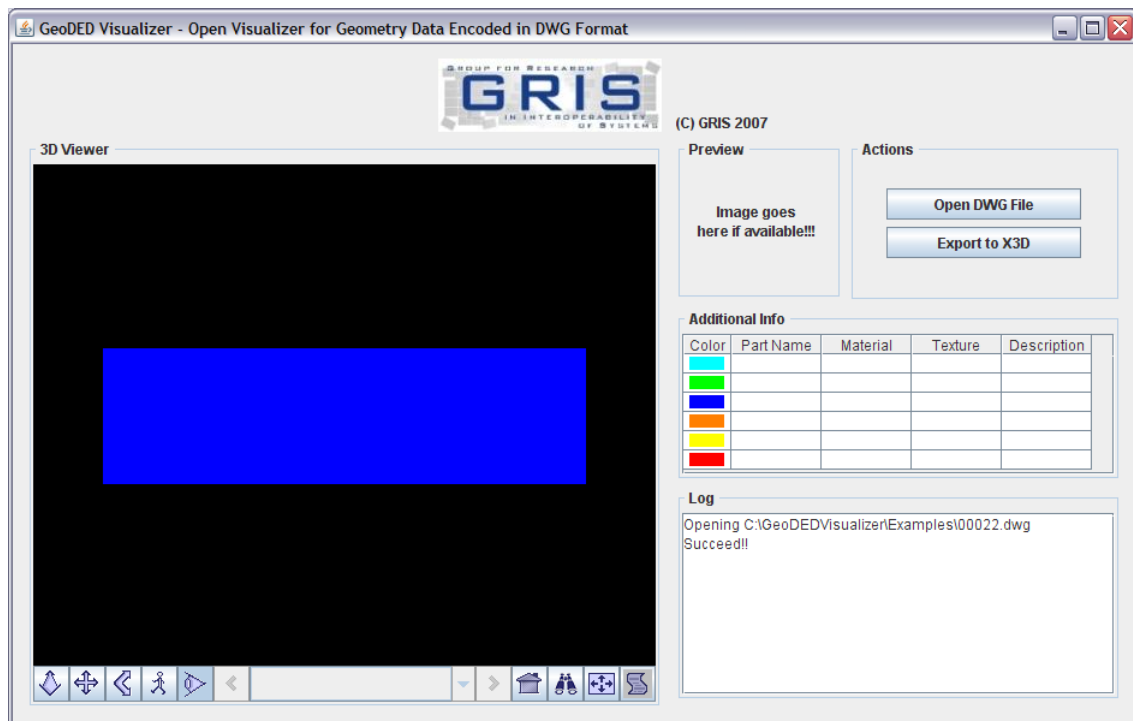


Figure 3 – View of the tool after open a DWG file.

Using the navigation buttons is possible to see the drawing of many other views, like is exemplified next:

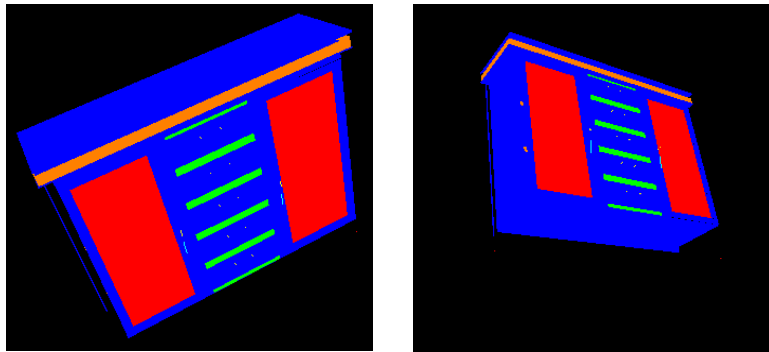


Figure 4 – Different views of the DWG file opened.

3.2.4. Associate extra-information to the drawing

The association, of extra-information to the model is a very simple task, the user only need to interact with the “Additional info panel”.

All fields are editable, by double clicking it, and editing the text that corresponds to the item.

There is a special case of the “Texture” field, when double clicked, a “Open file dialog” is shown, and is given the user the possibility to choose a texture from a image file.

An example of a filled “Additional info” is exemplified in the following picture:









Additional Info				
Color	Part Name	Material	Texture	Description
				
				
	Panels	Wood - Typ...		This are th...
				
				
	Doors	Wood - Typ...		

Figure 5 – Example of a filled “Additional info”.

This info will reflect in the exported X3D, but that will be focused later in the document, the only important fact to talk here, is that the texture image is applied directly in the 3D viewer like is shown next:

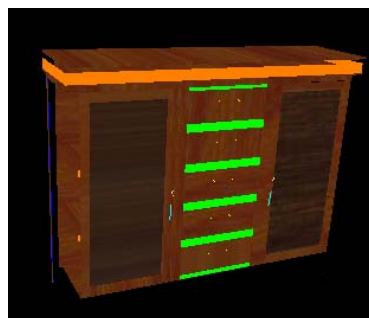


Figure 6 – Drawing after textures applied.

3.2.5. Export drawing to X3D

The action to export the drawing to X3D format is very simple.

After the DWG file is opened, and the extra-information filled as the user wishes, because it's not a required info for a successfully exportation, the user only needs to click on the "Export to X3D" button in "Action panel".

That action will open a "Save dialog box" that will permit the user to select which file to save.

3.3. Understand the exported X3D

The exported model in X3D consists in two parts, the XML document itself, and if are textures associated to the drawing, they go with the file in a separated directory with the "filename_Texture".

Next goes an example, of a portion of the output of the exported XML.

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<X3D profile="Interchange" version="3.0">
  <head>
    <meta content="00022.x3d" name="Title"/>
    <meta content="Tue Nov 06 00:05:17 GMT 2007" name="Created"/>
    <meta content="UNINOVA-GRIS GeoDED Visualizer - Open Visualizer for Geometry Data
Encoded in DWG Format" name="Generator"/>
  </head>
  <Scene>
    <Group DEF="blue">
      <Group>
        <WorldInfo title="Part Name" info="Panels"/>
        <WorldInfo title="Material" info="Wood - Type 2"/>
        <WorldInfo title="Description" info="This are the main panels of the closet"/>
      </Group>
      <Shape>
        <Appearance DEF="51">
          <ImageTexture url="./00022_Textures/51.jpg"/>
        </Appearance>
        <IndexedFaceSet coordIndex="0,1,2,3" solid="false">
          <Coordinate point="5.00 0.00 14.33, 144.00 0.00 14.33, 144.00 0.00 125.00,
5.00 0.00 125.00"/>
        </IndexedFaceSet>
      </Shape>
    </Group>
  </Scene>
</X3D>
```

Figure 7 – Portion of the exported X3D XML file.

Analyzing the output, we can see, that the parts are grouped by their drawing colors, each group can have the extra-information described in the file.

The texture is a link to the image exported with the file, and the rest that can be seen in this portion of the file, is the description of the shape, in this case, a face, with all the points that refers to the vertices.

In the head part, goes the information, of the title of the drawing, the date it was created and that is generated by this tool.

Troubleshooting

Since this is an academic version of GeoDED Visualizer, some problems may appear during its usage. The following section of this guide covers the basic troubleshooting, such as common problems people have reported.

- **In exportation for X3D some objects are missing:** This version of the tool only support the extraction of the "3DFaces" and "Lines" of Autocad drawings.