NAME
> **stl2pdf** -- Projects an STL file on the (x,y) plane after optionally rotating it and renders a PDF figure of it.

SYNOPSIS
> **stl2pdf** infile [*outfile*] [x *degrees* | y *degrees* | z *degrees* ...]

DESCRIPTION
> This manual page documents '$Revision: 3.1 $' of the **stl2pdf** program. This program's purpose is to render a globally illuminated grayscale projection of an STL file as PDF output.
>
> First, the STL file is parsed. Both binary and text STL file can be read, but any color information in binary STL files is discarded since this is not standardized. While STL files are supposed to contain closed solids, by design no effort is made to try and repair gaps in the STL file. There simply isn't enough geometric context to do this in a foolproof way.
>
> Next, all the triangles in the file are rotated around the axis of the global coordinate system, as specified by the sequence of rotation options given on the command line.
>
> Finally, the visible triangles (visibility is determined by a non-negative z-component of the unit normal vector of the triangle) are sorted by depth, projected on the (x,y) plane. So in the PDF picture you are looking along the z-axis to the origin. The picture is scaled to fit in a maximum size of 100x100 mm and the triangles are drawn from back to front. The grayscale tint of the triangle is also determined by the orientation of the triangle; running from almost black for triangles turned 90 degrees to the line of sight to near white for triangles parallel to the x,y plane.
>
> If no output filename is given, the path and the '.stl' extension are stripped from the input filename. The extension is replaced by the '.pdf' extension. So if no output filename is specified, the output file is written in the current working directory. The PDF file is written to the output filename.

EXIT STATUS
> The **stl2pdf** utility exits 0 on success, and >0 if an error occurs.

DIAGNOSTICS
> The following non-fatal warnings can be issued when the program cannot make sense of command line arguments:
>
> Unknown argument '...' ignored.
>> One of the command line transform arguments did not start with one of the letters 'x', 'y', 'z', 'X', 'Y' or 'Z' and will be ignored.

Argument '...' is not a number, ignored.
> A non-numeric value was encountered among the command line arguments while a number of degrees is expected as part of a rotation command. It will be ignored.

There are some errors which the program cannot ignore, and which will terminate the program.

The file '...' cannot be read or parsed. Exiting.
> If a given input file cannot be read, or if the file is not recognized as an STL file, this error is produced, and the program is terminated with exit code 1.

Cannot write output file '...'.
> An output file name was given on the command line, but the file in question could not be opened for writing or written to. The program is terminated with exit code 2.

COMPATIBILITY

The **stl2pdf** program requires the Python interpreter. It was written for version 2.7. Additionally, it requires the open source Cairo vector graphics library, as well as its Pyton bindings.

SEE ALSO

python(1), stl2pov(1), stl2ps(1)

Python Programming Language - Official Website, *http://www.python.org/*.

Cairo, *http://cairographics.org/*.

HISTORY

The origin of this software was found in the desire of the author to render 3D CAD models using the POV-ray raytracer. The first effort produced the stl2pov(1) program, written in C.

Later the author converted that program to Python as a learning experience. This resulted in a more re-usable version of the software to parse STL files as a Python module. Having done that, adding a front-end to produce PostScript output was relatively easy.

With the Cairo library it was relatively easy to modify stl2ps to produce PDF output directly.

AUTHOR

This manual and the **stl2pdf** software were written by Roland Smith <rsmith@xs4all.nl>.

The latest version of this program is available at: *http://rsmith.home.xs4all.nl/software/*

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