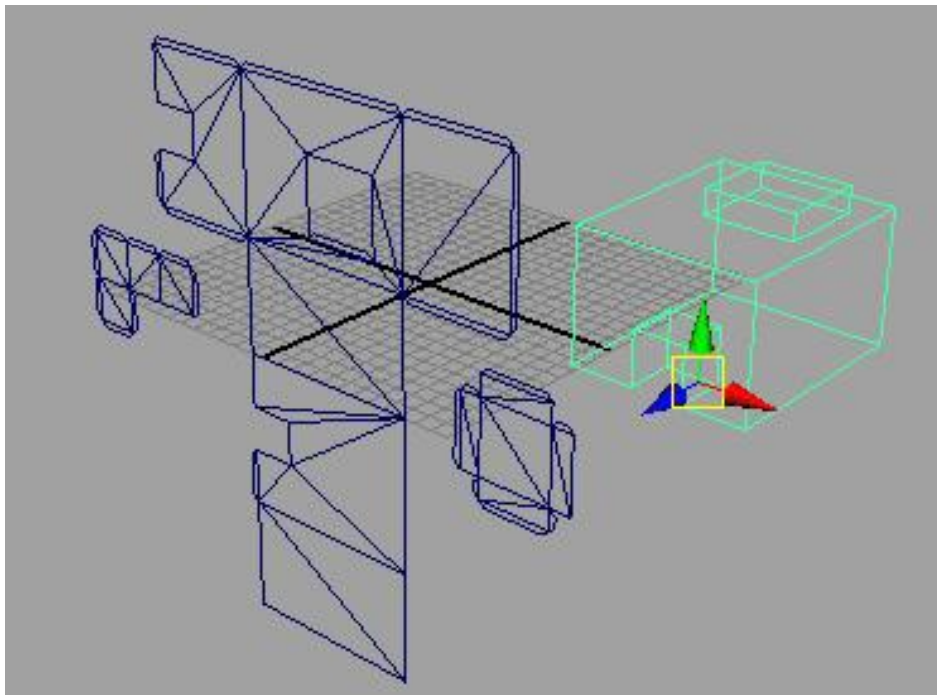


V1.0

Cutout - Documentation

Plug-in to create cutout-sheets



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Chapter 1

General

1.1 Overview

Cutout is a plug-in which creates cutout-sheets from simple 3D-models. They can be printed and conglutinated to a real papermodel. Therefor Cutout create the complete scenes, inserts glue-lugs on the colored models and if requested parts of the modell will distributed on different pages.

It is suited both to get a real model with a professional impression fast and for hobby practice too.

1.2 Features

- Embedding in the Maya envirement
- Detailed instructions in german or english language
- New algorithm leads to good results
- Textures and colors
- automatic inserting of glue-lugs
- optional limitation of papersize
- Undo-function

1.3 Systemrequirements

- Autodesk Maya 2009
- Windows
- 4 GHz

1.4 Remarks

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1.5 Provider

Cutout was produced by Dunreeb Gutschke&Klie GbR in 2009/2010.
<http://www.dunreeb.com>

1.6 Installation

1. Close your Maya-application.
2. Copy the **cutout.mll**-file in the `\plug-ins\`directory from your local Maya version. (in example `c:\Program Files\Autodesk\Maya2009\bin\plug-ins\`)
3. Start Maya 2009
4. Activate the **Plug-in Manager** located at `Window→Setting/Preferences→Plug-in Manager`
5. In the alphabetical list search for **cutout.mll**.
6. Activate the checkbox **loaded**.(see Fig. 1.1)
7. If plug-in auto-loading desired choose the **auto-load** checkbox
8. On the left side of the help-menu the new cutout-menu appears. Herefrom choose **Menu english**.
9. As an alternative you can type **cutoutmenu -l 1** on the mel-commandline. (See fig. 1.3)

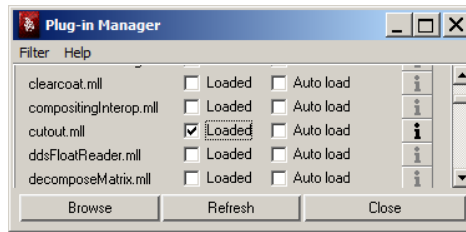


Figure 1.1: Activate the checkbox from the Plug-in Manager.

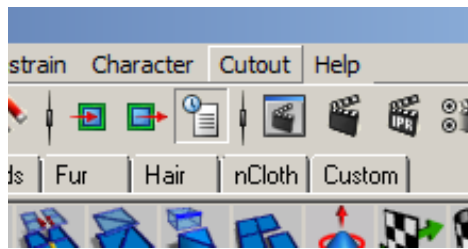


Figure 1.2: The new Cutout-Menu is on the left side from the help-menu.

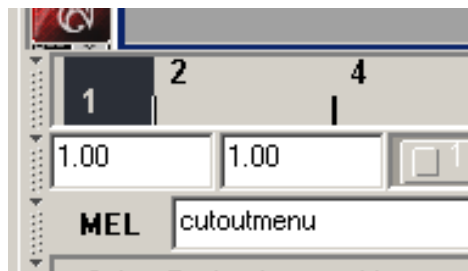


Figure 1.3: You can start cutouts graphical user interface in the mel-commandline.

10. The graphical user interface from the plug-in appears.

To close the plug-in deactivate the checkbox in the plug-in manager. The cutout-menu will vanish after that.

1.7 Check your Installation and First Steps

1. Create a polygonal cuboid (polygon cube: cuboid symbol with polygons-setting)
2. Select your cuboid
3. Press start in the plug-in window

The cuboid has changed into a cutout-sheet. It is able to render and to print. Following you can cut it out and glue the parts to get a real 3D-model.

1. Load the scene /building.mb
2. press start

After a short time the transformed scene appears which contains of several parts.

Chapter 2

Using Cutout

All settings and adjustments for the transformation can be done in a special window. That window appears either by typing **cutoutmenu** in the mel-commandline or select the cutout-menu. This commandline normally is below of the animation-bar. There are three tabs in the Cutout-window named **algorithm**, **format** and **lugs**. On every tab exist a start button below to start the transformation with the actual settings. The default settings was chosen in a way which allows to start transformation without any changing. However often it makes sense to change the settings.

2.1 Settings for the Algorithm

Two checkboxes can be chosen.

If **delete original** is activated, the current scene will vanish and replaced with the new scene consisting of the related cutout-sheets.

Otherwise the cutout-sheets will be inserted into the currend scene.

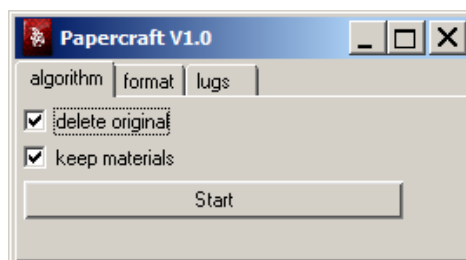


Figure 2.1: Settings for the algorithm.

If **keep materials** is selected simple material of the polygonal objects will be transferred. Here in general textures and colors are supposed, which can be regained in the cutout-sheets. If this checkbox isn't activated there are no special material properties in the created cutout-sheets. In that case on rendering one wouldn't see anything if there wasn't any further processing. This option could be useful if the pure geometric data are needed for exporting.

Both checkboxes are activated by the default settings.

2.2 Settings for the Format

The shape of the result can be determined here.

The pagesize is not limited by default settings. That can be reached by activate the checkbox **limitate pagesize**. In the fields **width(mm)** and **height(mm)** the desired maximum width and height of the parts respectively the cutout-sheet pages can be entered.

The preset is a size of 210mm x 297mm. This comply to a DIN A4-pagesize. If the pagesize limitation is activated the algorithm will try to create all parts small enough to fit in the page dimensions. Sometimes a single triangle is to big to fit, so there is no guarantee for that.

If there is a problem in that case it could be helpful to divide very big respectively the appropriate triangles.

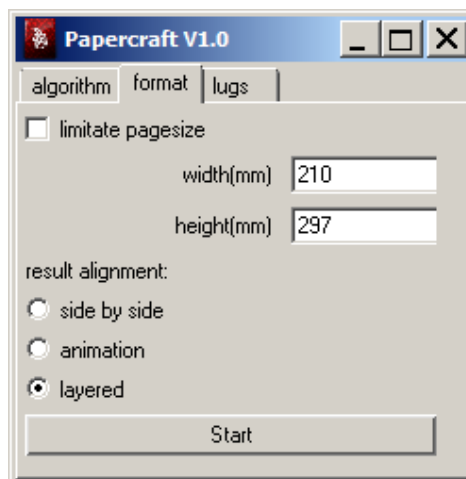


Figure 2.2: Settings for Format.

The radiobuttons named **result alignment** provide a choice of three possibilities for presenting the cutout-sheets.

Thereby **side by side** means that all generated parts will be arranged in a single plane. In doing so optional selected page limitations seems to vanish cause all pages will be put together. However, single parts are restricted by the selected maximum sizes also.

On the other hand **animation** will create an animation where in every frame a single part of the cutout-sheet is stored. For printing the hole cutout-sheet every frame has to render and to print. There's exactly one part on each frame.

By selecting **layered** all single parts will inserted in the scene one on top of each other.

2.3 Settings for the Lugs

To build real 3D-models from the cutout-sheets printed they have to glue together at the edges. Therefore Cutout insert lugs on special part positions. If that default setting isn't desired, deactivate the checkbox named **generate lugs**. On the other hand its possible to insert the maximum size of the lug width in the textfield **maximum width(mm)**.

The algorithm will try to insert lugs in a trapezoid like shape. If the edge where the lug should be added is very short it may happen that a lug in a triangle shape only will be inserted. In that case it might be that the selected maximum width will not be reached.

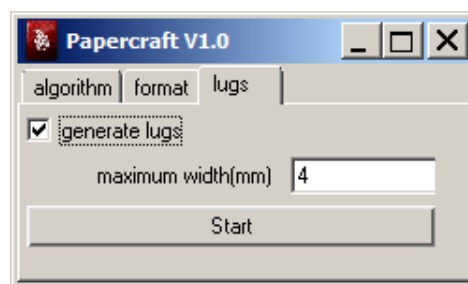


Figure 2.3: Settings of lugs.

If **keep materials** is selected in the **algorithm** algorithm menu, the lugs will get a standard material.

2.4 Printout and Assembly

After transformation you can render the cutout sheets and print them out. Cut out all parts. That will work fast and accurate with a cutting board, a metal ruler, a cutter knife. For folding its helpful to be geared to the original. For easier folding you can scarify the lugs. This is recommend by using thick board. A needle can be used for press on the last unreachable lugs in the corners. Don't choose thick paper if many little elements exist. Don't choose thin paper to ensure stability with big elements.

2.5 Troubleshooting and Optimisation

To prevent problems the scene can adjusted before transformation. The following modifications can be helpfully:

- Remove all objects which aren't polygonal elements. Especially remove bones and rigging.
- Remove all animation elements.
- Try the **Triangulate** on the commandline.

For speed up the calculation you can do following modifications:

- Decrease the number of polygons. They should be repretable with 3 digits.
- Divide your objects in parts and transform them separately. To transform 2x50 faces is faster as 100 faces all at once.
- Decreasing the maximum pagesize will induce a speed up in many times.

Additional Annotations

- Save your work before starting the transformation.
- Don't forget to use a new filename after transformation. Otherwise your original work will be overwritten.

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