

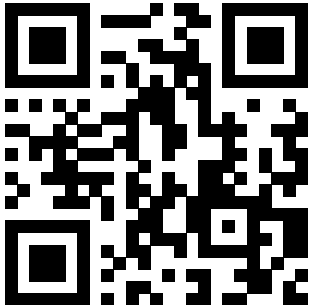
DUNREEB CUTOUT

INSTRUCTIONS FOR THE PROGRAM

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1 General

1.1 Overview

Dunreeb Cutout Standalone is a software which can be used to create Paper sheets from 3D models. These can be printed and glued, so that you get your 3D model as a real paper model.

1.2 Features

Dunreeb Cutout supports the following features:

- Converts a 3D-mesh to a printable papercraft
- Handles textures, single colors or mixed materials
- two different unfold strategies
- Final page size of the papercraft can be limited
- Final part size can be limited
- The size of the lugs can be adjusted
- Optional fold- and cutlines can be drawn
- Numbers on edges and lugs help to assign for glueing
- Papersheets can be exported as SVG
- Mirroring for generating instructions on the back side
- Papercraft element can be arranged later
- Special cutting paths can be forced or avoided
- Flexible star-mesh generator included
- Compatibility: Windows, Mac OSX

1.3 Remarks

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1.4 Provider

Dunreeb Cutout Standalone was produced by Dunreeb Gutschke&Klie GbR in 2016-2018.

<http://www.dunreeb.com>

2 Dunreeb Cutout Standalone

2.1 Main Application

The software uses 3D models in the OBJ format for the creation of papercrafts. As an alternative files in PLY format can be used, but without material properties. You can use the Open function to load such a model. The Open-function can be found in the menu item "File", but can also be activated by the second icon of the function bar. You can also use the keyboard shortcut **ctrl-o**.

After the loading process (which also takes some time for larger files), the model is displayed as a 3D object in the window on the right - the viewer - and can be viewed and zoomed from all sides using a mouse or keyboard.

To get a first result just press the "Start" button. Again use the mouse-wheel or press "+" and "-" to adjust the zoom level if desired. The "Start" button is now replaced by the "Back" button. Figure 2.2 shows the example as an unfolded papersheet.

If more than one sheet was generated, press "Previous" and "Next" buttons on the left to thumb through all of them.

Pressing the "Back" button will return to the model view while the "Start" button will be restored.

By pressing the "Print" button or **ctrl-p** enables you to print the desired pages.

Alternatively, with the help of the `Save as` button or `bold strg-s` the generated, displayed papercraft can be saved in SVN format. The current settings are taken into account. This button has a different function in the model view. Here it is used to save the current 3D-model as an OBJ-file including the associated MTL material file.

2.2 Control

To the left is the controlpanel. Here you can see the current page of the papercraft. If it is calculated and consists of several pages, it can be selected by using the "prev" and the "next" button. In the 3D model view they have no function.

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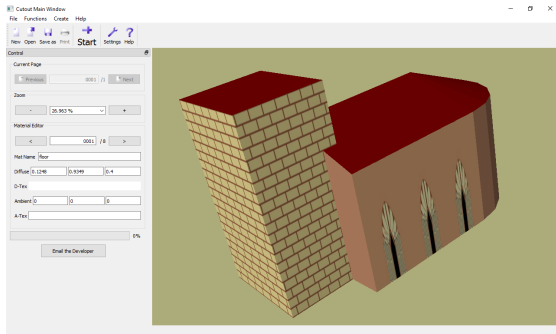


Figure 2.1: 3D-model

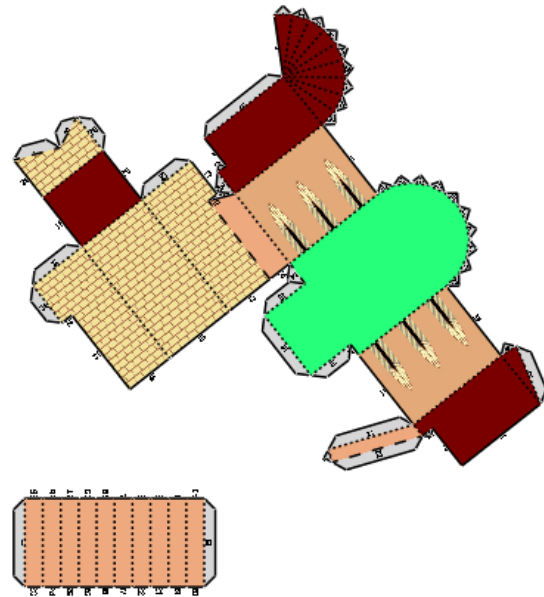


Figure 2.2: A resulting papersheet

Below is the zoom value. This can be changed either directly or with the buttons.

The properties of the materials of the current model can be viewed in the material editor. You can use the "<" and the ">" button to select one of the numbered materials. The color values for diffuse light can be edited. The three input fields correspond to the red, green and blue values in the range 0.0-1.0. Three additional materials are added: "Default" as the default material, "Background" for the background of the papercraft and "Lugs" for the glueing lugs.

The progress indicator for calculating the papercrafts is positioned at the bottom. It will be run at most 6 times. The current work step is shown.

2.3 Additional Settings

2.3.1 Alignment

By pressing the "Settings" button followed by choosing the "Alignment" tab some additional settings can be done. "Drawing mode" enables you to decide how the generated parts of the model will be arranged on the sheet which is constrained by the entered "Component distance". If "Autoscale" is checked Cutout will choose a

suitable scalefactor for the model, else the entered "Scale factor" will be taken. By checking "Limit partsize" this size of generated parts/components are limited to the sizes entered in "component width" and "-height".

2.3.2 Format

By pressing the "Format" tab you can adjust some attributes of the page. Actually the page has always to be limited. The size can be determined in "Width" and "Height". Additionally the sizes of the borders can independently be chosen in the "Top", "Left", "Right" and "Bottom" fields.

2.3.3 Extras

Here you can choose between two strategies for creating the papercraft. You can choose if you want to preserve long edges or small angles. Depending on the model, one or the other option may be advantageous.

If your model consists of single triangles which are not connected there will be no lugs generated between them. This is a correct consequence of the fact that if faces are not logically connected they will be handled at a "not glued" state. If you will handle them as connected triangles which will lead to lug generating enable the "Merge vertices" option in the settings dialog after selecting "Extras" as shown in Fig.2.5. This will cause that vertices on the same place act like one vertex. Important: This item must be selected **before** importing an .obj file.

Also material loading can be switched off here. To do this, the checkbox for "don't load materials" is set. If loading of materials, loading of textures can be switched off. To do this, set a checkmark for "don't load textures".

In this submenu you can also adjust the maximum width of the lugs or disable them completely. The latter is controlled by the checkbox "generate lugs". The program will try to use this value for the width of the generated lugs. Only if the lugs are very small and appear as a triangular shape it could be smaller.

Finally, it can be adjusted for both cutting lines and folding lines independently, the color and the linetype (solid, dashed or dotted). In the case of the fold lines, a distinction is made as to whether the edge is folded inwards or outwards.

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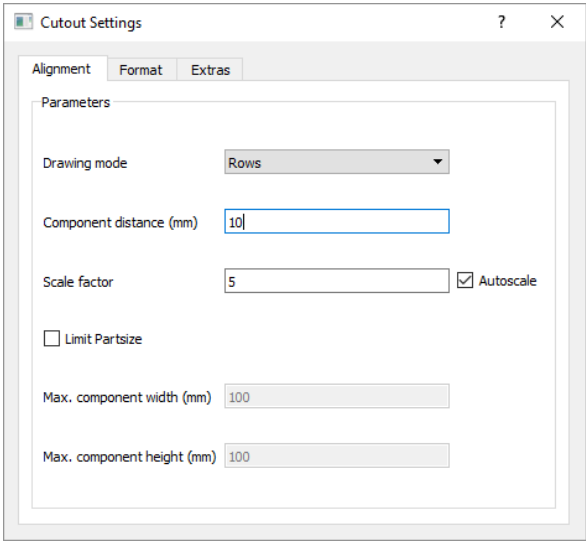


Figure 2.3: Alignment dialog

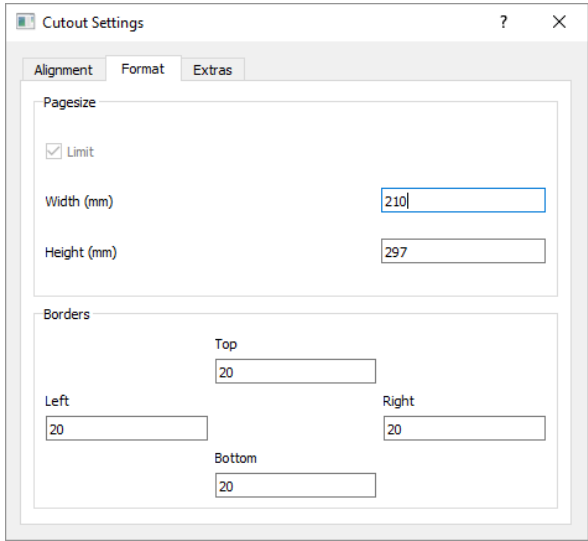


Figure 2.4: Format dialog

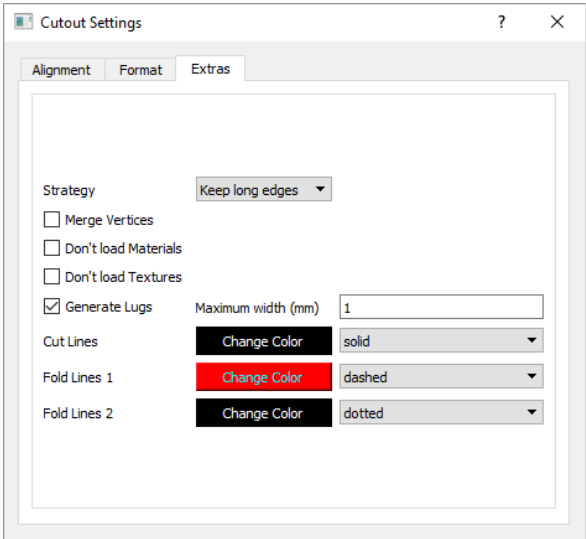


Figure 2.5: Extras dialog

2.4 Functions

By the "Functions"-Menu you can reach some other possibilities of the program, which are discussed here. The corresponding keyboard commands can be found at the end of the manual.

With "Material", the display of the material can be switched on and off in both display modes. This includes the lug material (visible only in the papercraft). This can be switched on and off independently using "Lug Material".

With "Mirror Parts horizontally", all parts are mirrored on their own vertical axis. In contrast, "Mirror Page horizontally" mirrors the whole Page on an axis that is centered, perpendicular. Options "Mirror Parts vertically" and "Mirror Page vertically" are analogous, mirroring on horizontal axes. All four functions can be selected independently.

The option "Cutlines" allows you to select whether necessary cuts should be displayed as black lines. The option "Foldlines" works similarly for fold edges. These are shown as dashed lines. The line is punctured or dashed, depending on whether there is a ridge (away from the user) or a valley edge (towards the user). Option "Numbering" allows the numbering of the edges and lugs. Should an edge and a tab glued with each other, they are given the same number.

The options allow you to create assembly instructions. If, for example, cutting and folding edges are printed with numbering without materials, mirrored on the back side, glueing instructions are obtained without a substantial additional work.

Of course all settings are taken into account both during printing and SVG export.

2.5 Edit Mode

You can switch to edit mode and back using the space bar. In edit mode, cut paths can be specified. In addition, edges can be marked on which no cuts are desired.

Within edit mode, materials are not visible. Instead, you can see the complete triangle mesh. If you have already created a papercraft you can click in a triangle. The state of the closest edge will be chosen. At the beginning the edge is black. This is the normal state.

After the first click, the edge turns green. This forces a cut at this edge. To see the impact and recalculate the papercraft, the back button and then the start button must be pressed.

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A second click on the same edge turns it red. For red edges, the algorithm tries, as far as possible, not to make the edge a cut edge.

If you click a third time, the edge turns black again and is in normal state again.

2.6 Create

In this menu, you can create simple 3D objects. They can be saved as OBJ files or used to generate papercrafts.

2.7 Shortcuts

Shortcuts (focus in viewer-window):

esc	stop calculation
i	info
1	standardview
+ or shift_up	zoom in
- or shift_down	zoom out
c	center
C	center and scale
m	toggle materials
ctrl-n	new
ctrl-o	open
f1	help
space	toggle edit mode

In 3D-mode only:

up and down	x-rotate
left and right	y-rotate
shift_left and shift_right	z-rotate

In unfolded-mode only:

shift_+ or PageUp	next page
shift_- or PageDown	previous page
x	mirror parts horizontally
X	mirror side horizontally
y	mirror parts vertically
Y	mirror side vertically
t	toggle cutlines
f	toggle foldlines
n	toggle numbers
M	toggle lug-material
ctrl-s	save as svg
ctrl-p	print current page
