

FREDOTOOLS::AUTOREVERSEFACES



Align Face Orientations

QUICKCARD – v1.0 – 25 FEB 2015

1. Overview

AutoReverseFaces is a standalone script which **automatically perform the alignment of face orientations as well as their proper orientation on shapes that looks like a solid**, that is, where visually you could tell where is the inside and where is the outside.

IMPORTANT: **AutoReverseFaces** is primarily useful when you have a patchwork of faces with good and bad orientation. The reason is that the algorithm tries first to identify the ‘good’ orientation, and then propagate it to the other faces by adjacency.

Note: the algorithm is also used by the *FredoTools::Convexify* plugin, because it needs consistent face orientation in order to decide whether a shape is convex or not by properly detecting concave edges.

AutoReverseFaces is part of **FredoTools v2.6** and above. See FredoTools installation.

2. Usage

AutoReverseFaces operates on a Selection. When you launch it with no pre-selection, you are asked to confirm whether you wish to apply it to the **whole active model**.

There is no menu, no button palette and no option for this plugin. There is just a **progress bar** in case you have a complex model which may take time to compute.

The script works on **top level geometry** as well as on **sub-groups and sub-components at any level**. For components, the reversing of faces is done for all instances (i.e. it does not make the component unique).

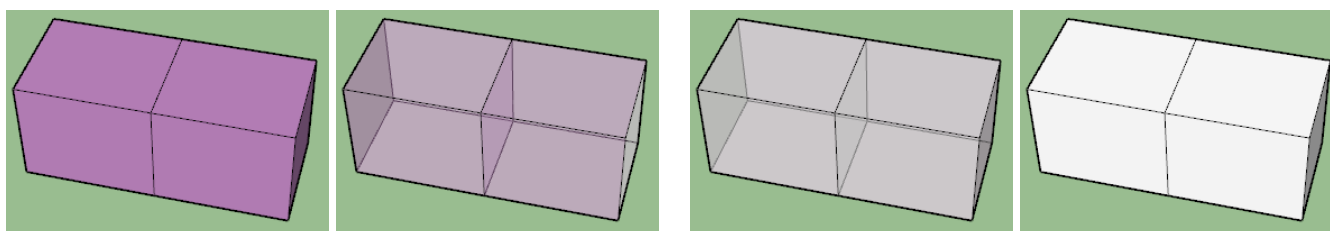
Note: **AutoReverseFaces** turns the view to monochrome rendering while processing but reestablishes it to its initial settings when finished.

3. Case of Applications

AutoReverseFaces is:

- **Automatic:** it does not require to click on a face or enter parameters
- **Somehow independent from the current view:** actually, this is true for shapes that have an inside and outside. Otherwise, AutoReverseFaces tries to identify a ‘good’ face orientation from faces facing the camera and extend it to others by adjacency.

One particular case is related to **internal partition faces**. AutoReverseFaces can normally evaluate and orientate properly the external faces.

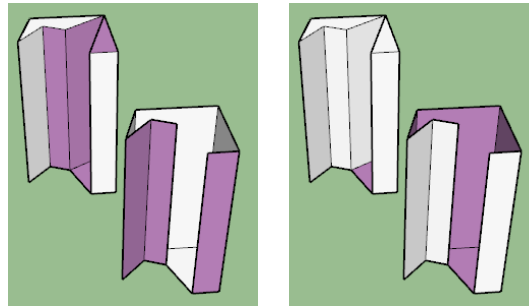


Initial shape

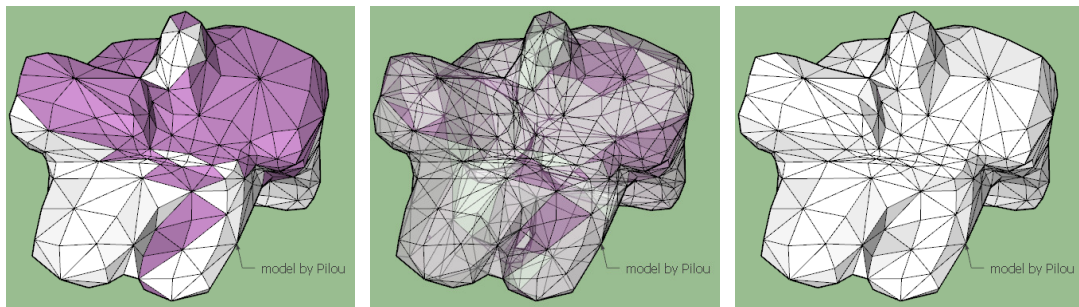
It includes a partition face

External faces oriented

AutoReverseFaces can also manage **open solids**, whenever there is anything that would indicate visually an inside and outside.



Complex models can also be handled, though the result may not always be satisfactory.

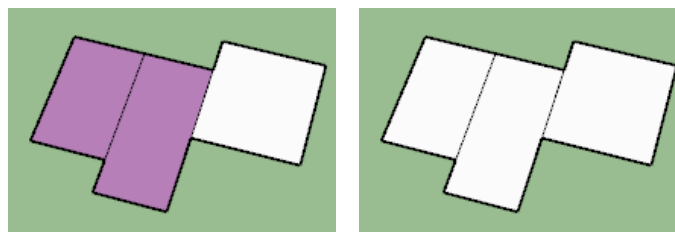


Original model

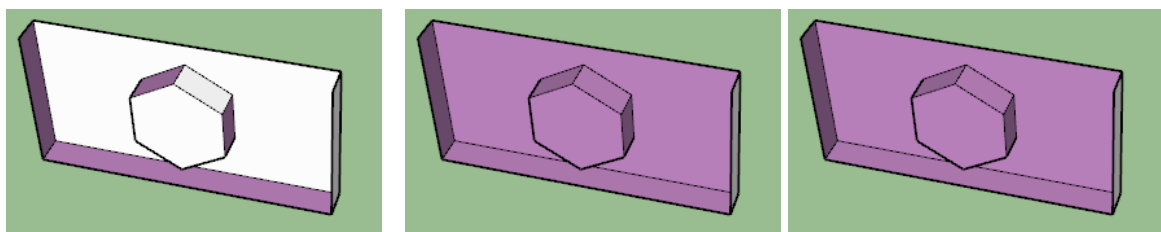
*Several partition faces
And concavities*

Auto-Reverse

For **flattish faces** which does not really resemble to anything close to a solid, AutoReverseFaces just align the orientation of faces based on the camera direction of the current view



However, as soon as there is anything that would make it look like a portion of solid, **AutoReverseFaces** can be more relevant in the orientation:



Original shape

*First Application of
AutoReverseFaces*

*Further applications
will not change the orientation*

In conclusion, extra care is required for application on large models, and again, this works better to fix inconsistencies in face orientations from existing 'good' faces than to reverse faces selectively (there are other plugins for that). It is easy to fool the algorithm!