QUVEditor

User Manual

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1. INTRODUCTION

UV mapping is the 3D modeling process of projecting a 2D image to a 3D model's surface for texture mapping. Every vertex / edge / polygon in the UV map corresponds to a vertex / edge / polygon in the mesh. These coordinates define the way an texture is mapped onto the polygon.

QUVEditor is a tool for editing UVs of objects. It provides various functions to simpilify the process of UV creation.

For the purposes of this manual, the following terms are used:

- *Sub-element* - is a part of the UV texture coordinates that represent a vertex, an edge, or a polygon.

- *Element* - it is a set of connected sub-elements, separated from another sub-elements.

2. LIMITATIONS

It is important to understand the limitations that Unity imposes on editing the texture coordinates:

- Unfortunately, you can not edit the model file directly. You will have to re-save the model as .asset file and modify it.

- Unity has the limitation of 65,000 vertices, so the QUVEditor also has this limitation.

- Since the QUVEditor gets information of the mesh via Unity's built-in functions, the QUVEditor supports only triangular topology.

3. OVERVIEW

After importing the package, use a Tools → QUVEditor menu to opening the editor window:
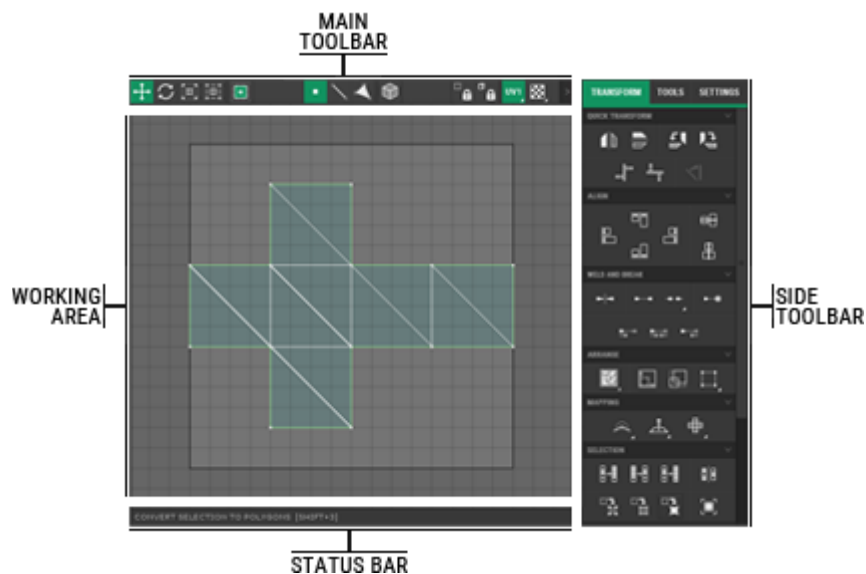
The QUVEditor consists of four main panels:

- The central panel is the main working area. It is used for viewing and editing the UV of the objects selected in Unity.

- The top panel contains the main controls, which are used for setting: transform mode, edit mode, and some additional options.

- The side toolbar contains an advanced set of tools for editing the UV coordinates. It also contains some additional utilities and editor settings.

- The bottom panel is a status bar that shows various tips and additional information. It also shows the status of the currently executing command, and cancel button of it.

To open a UV of any object, just select it in the Unity (in the hierarchy window or in the project window). You can also select multiple objects to be able to edit multiple UVs simultaneously. The sub-elements selected in the editor will also be displayed in the scene view window. You can also select sub-elements directly in the scene view.

4. WORKING AREA

The working area is a view of the QUVEditor that displays the UV coordinates in two-dimensional space. The area limited by thick lines determines the area of texture space, where the bottom left position corresponds to UV coordinates (0;0) and the top right position corresponds to UV coordinates (1;1).

To navigate in the working area use:

- [MOUSE WHEEL] for zooming in and out,

- [MIDDLE MOUSE BUTTON or SPACE] + [DRAG] for panning.

For selecting sub-elements use:

- [LEFT MOUSE BUTTON] for selecting sub-element,

- [LEFT MOUSE BUTTON] + [DRAG] for selecting multiple sub-elements within a rectangular region,

- [DOUBLE CLICK THE LEFT MOUSE BUTTON] on the sub-element for selecting the entire element to which it belongs.

The following function keys may be used for selecting sub-elements:

- [SHIFT] for add a sub-element to current selection,

- [ALT] for remove a sub-element from current selection.

Only one type of sub-elements can be selected simultaneously (vertices, edges or polygons).

5. MAIN TOOLBAR

The main toolbar contains three groups of buttons:

- The left group of buttons is intended for switching the transform mode;
- The central group of buttons is intended for switching edit mode;
- The right group of buttons is used for locking selection, selecting a UV channel, and selecting a texture.

5.1 TRANSFORM MODE

This group of buttons is used for switching between modes of sub-element transformation: moving, rotating, scaling and freeform transformation. It also contains the pivot point position switch.
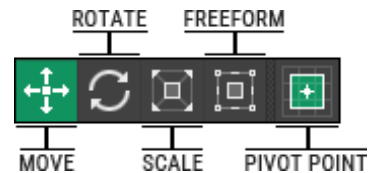

5.1.1 Move mode

In this mode you can select and move sub-elements.

Hold down the [Shift] key while moving to constrain movement vertically or horizontally.

While moving in the status bar you can see the coordinates of the mouse position and the difference between the start and current positions.
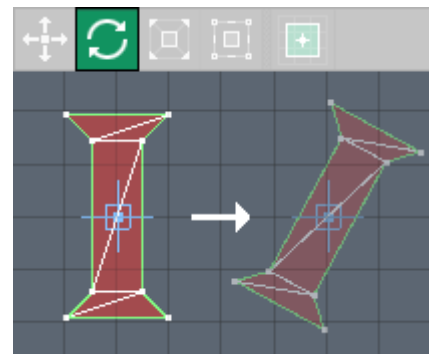
Also you can move the selected sub-elements with arrow keys. In this case, the sub-element is shifted exactly by one pixel. Use Shift to increase this distance up to 10 pixels.
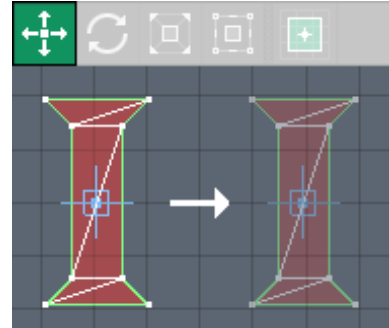
5.1.2 Rotate mode

In this mode you can select and rotate sub-elements. Rotation occurs around the pivot point.

While rotating in the status bar you can see current rotation angle.

5.1.3 Scale mode

In this mode you can select and scale sub-elements. Scaling occurs around the pivot point.

Hold down the [SHIFT] key to constrain scaling vertical or horizontal.

Hold down the [CONTROL] to scaling is uniform.

While scaling in the status bar you can see the scaling value along both axes in percentage.
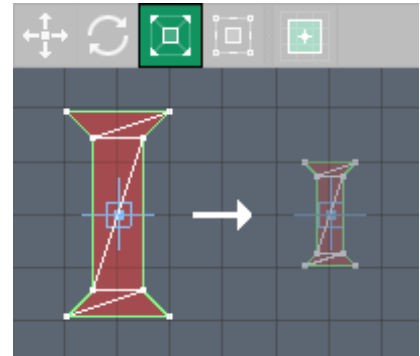
5.1.4 Freeform mode

In this mode you can select and move, rotate and scale sub-elements exactly in the same way as in the previous modes. The type of transformation depends on where the drag is started. After the sub-element is selected, a transformation frame is displayed around it.

- • To move the sub-element, start dragging inside the frame;

- • To rotate the sub-element, start dragging the square areas at the centers of the frame borders;.

- • To scale the sub-element, start dragging the square areas at the corners of the frame.
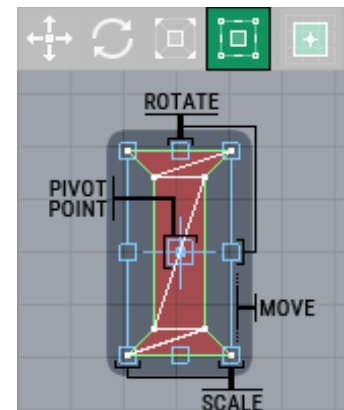
You can also freely change the position of the pivot point by dragging it.

5.1.5 Pivot point

The selector allows quickly move the pivot point to one of nine positions. Click on the desired quadrant of the selector to change position of pivot point. Rotation and scaling always occur relative to the pivot point.
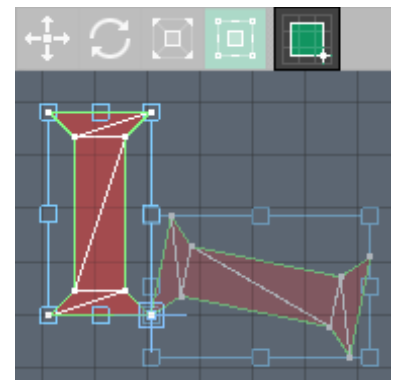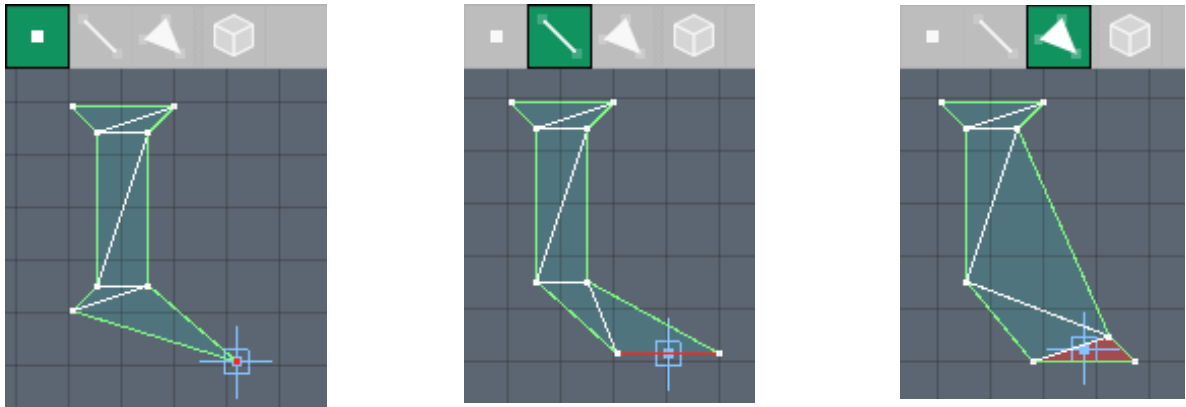
5.2 EDIT MODE
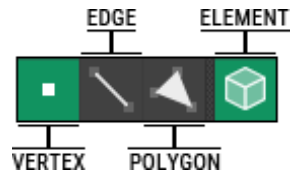
### 5.2.1 Vertex / Edge / Polygon

The selector allows switching between editing modes that correspond to the types of sub-elements: vertex, edge and polygon. Depending on the current editing mode the behavior of some functions may be changing.

5.2.2 Element Toggle

The switch changes behavior of selection the sub-element. If it is enabled, selecting a sub-element selects the entire element to which the sub-element belongs.

5.3 OPTIONS
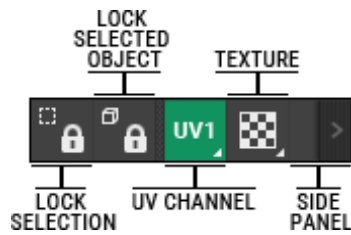
5.3.1 Locking selection

Use this toggle to lock current UV selection from adding or removing sub-elements from the selection.

5.3.2 Locking objects

When on, if the selection has been changed in the Unity, then the QUVEditor will still display the previous selected object.

5.3.3 Choosing the UV channel

When pressed, shows a drop down list for selecting the UV channel. An object may have up to four UV channels. The active channel is displayed in green. The existing channel is displayed in light-gray, and may be selected. The non-existent channel is displayed in dark-gray, and cannot be selected.

You can create non-existent channels, delete the existing ones, and copy one channel to another. To do so, click the right mouse button on any channel to display the context menu.
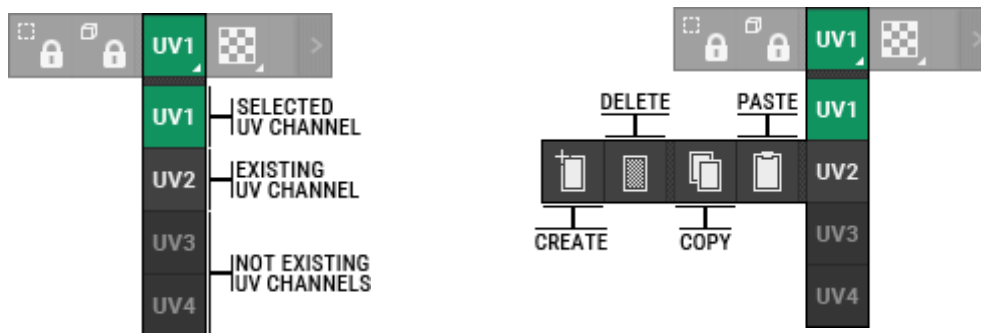
5.3.4 Choosing the texture

When pressed, shows a drop down list for selecting the texture. The selected texture will be displayed in the area of texture space in the working area.

Initially, the list contains textures that have been assigned in the materials of the object. You can choose any other texture by clicking "Select custom texture". You can also disable the texture by selecting "Without texture".
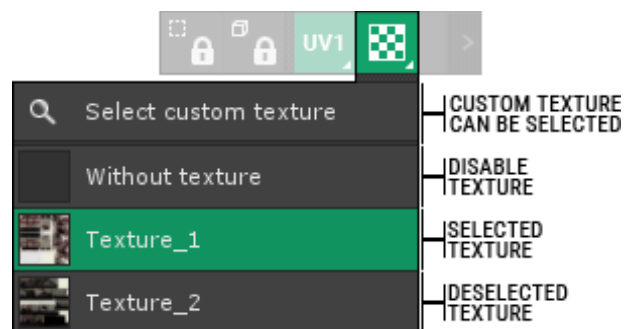
5.3.5 Side toolbar switch

Using this button you may show and hide the side toolbar.

6. STATUS BAR

6.1 INFORMATION

When the mouse is over active elements of the interface the status bar displays some information and hints about it.

6.2 PROGRESS BAR

During long operation the status bar displays a progress bar. During such operations the QUVEditor interface is locked and you cannot interact with it. You can cancel the current operation by pressing Cancel button located next to the progress bar, or by pressing the [ESC] key.

7. SIDE TOOLBAR
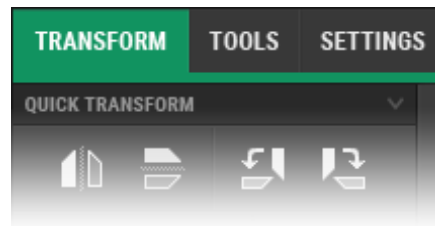
The side toolbar contains three tabs:

- Transform - contains tools for creating and editing the texture coordinates;

- Tools - contains additional utilities;

- Settings - contains QUVEditor settings.

Each tab displays a list of roll-ups that can be expanded and collapsed as needed.

7.1 TRANSFORM

7.1.1 Quick transform

The toolbar contains several frequently used transformations:

- Flip horizontal and flip vertical.

- Rotate 90 degrees clockwise and counter-clockwise.

- Align vertices horizontally or vertically.

- Rotate edge to horizontal or vertical (whichever is closest) and whole element to it (the function is only active in the edges selection mode; only one edge should be selected).
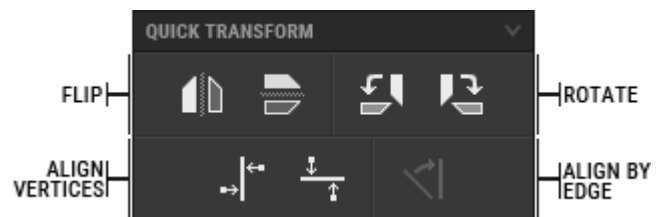
7.1.2 Align

By selecting several elements, you can align them with each other within bounds, either vertically or horizontally.

7.1.3 Weld and break

Use "Break" function to break the connection between the selected sub-elements.

Use "Weld" function to welding sub-elements if it is possible. Welding occurs only between the selected sub-elements, regardless of the distance between them.

The " Weld nearby" function is similar to the previous function; the only difference is that you can specify the maximum distance between the sub-elements to be welded. Clicking on this button shows a dialog where you can specify the required radius.

The "Target Weld" function allows connecting two sub-elements. Turn on "Target Weld", and then drag one sub-element to another. To exit "Target weld" mode you will need switch it off, by click it again, or use the [RIGHT MOUSE BUTTON].

Note that the sub-elements that can be welded are highlighted by default in blue.

The "Weld to" function allows welding the currently selected sub-elements with sub-element available for welding even if they have not been selected.
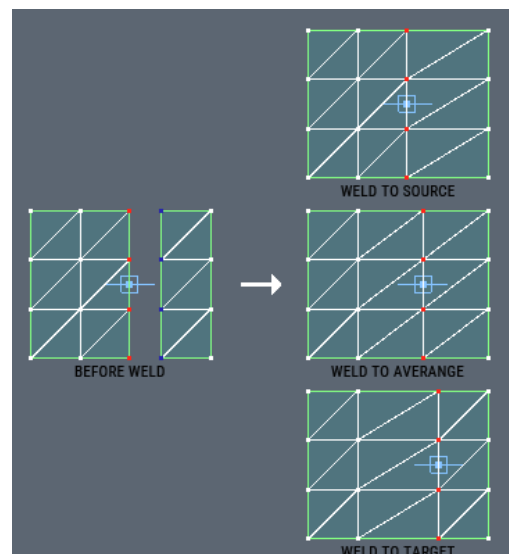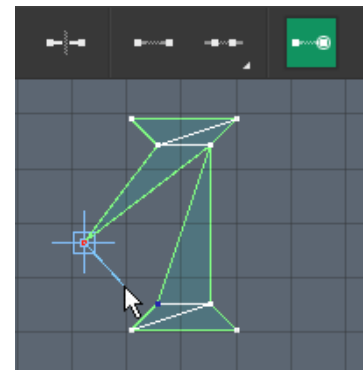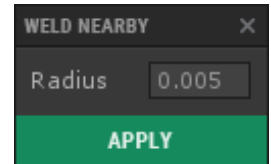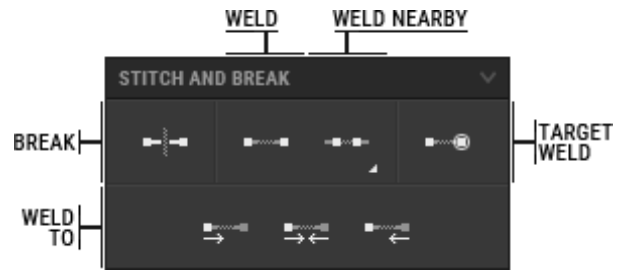
7.1.4 Arrange
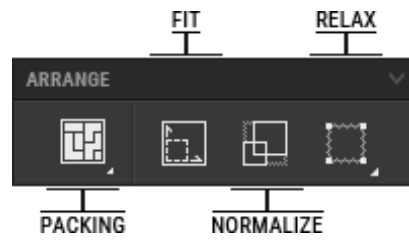
7.1.4.1 Packing

This feature allows placing elements in the texture space without overlapping.

Clicking opens a dialog where you can specify following settings:

- offset – the space between the edge of the texture space and the elements;
- spacing – the space between the elements;
- rotation – allow elements rotation;
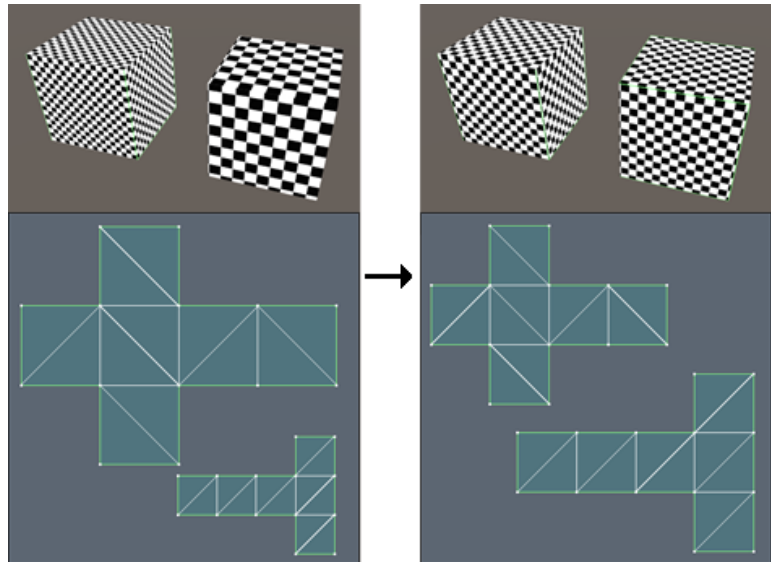- normalize – fit the elements inside the texture space.
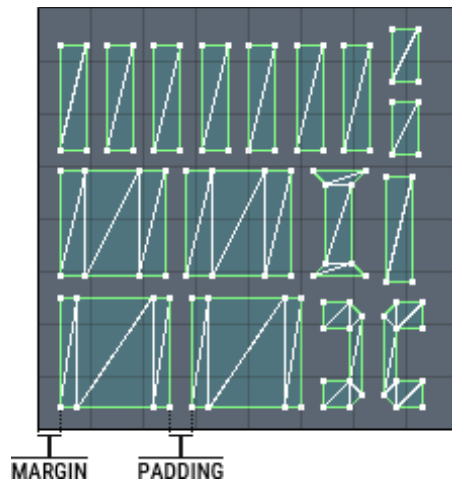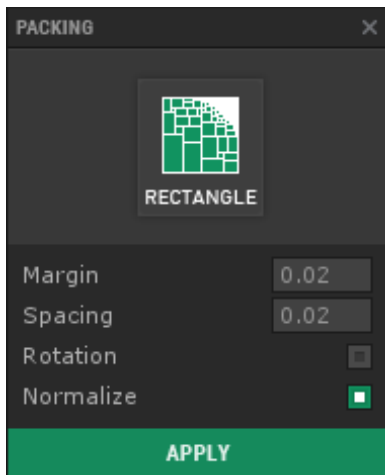
7.1.4.2 Fit

This function scales the selected elements to fit them into the UV texture space.
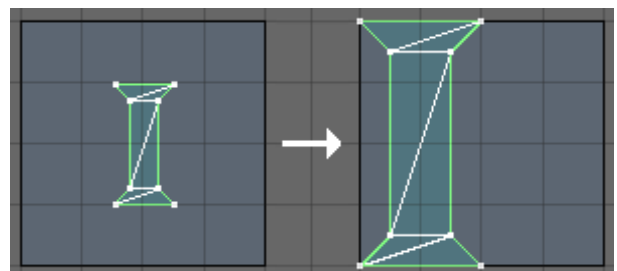
7.1.4.3 Normalize

This function scales selected elements, in proportion to each other.

7.1.4.4 Relax

This function transforms the selected elements to reduce distortion.

Clicking opens a dialog where you can specify following settings:

- Force amount;

- Preserve outside edges (lock positions of the outside vertices).

The transformation is iterative, meaning that after clicking the "Start" button, you will gradually watch the transformation that will continue until the "Stop" button is clicked.
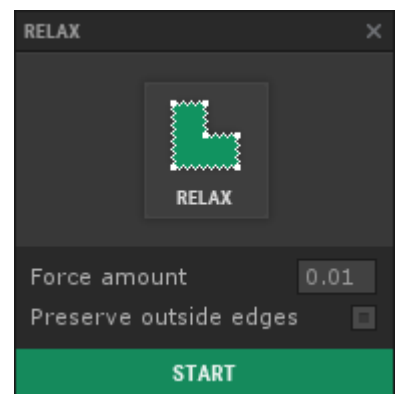
7.1.5 Mapping
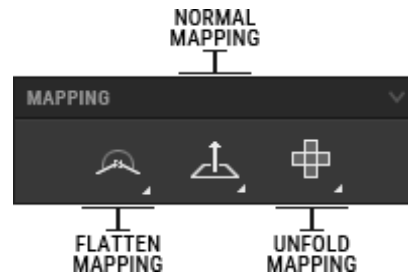
7.1.5.1 Flatten mapping

Flatten mapping is a method of procedural generation of texture coordinates, which creates elements of polygons that fall within a specified angle threshold.

Clicking opens a dialog where you can specify following settings:

- threshold angle - the maximum angle between any two polygons of the element;

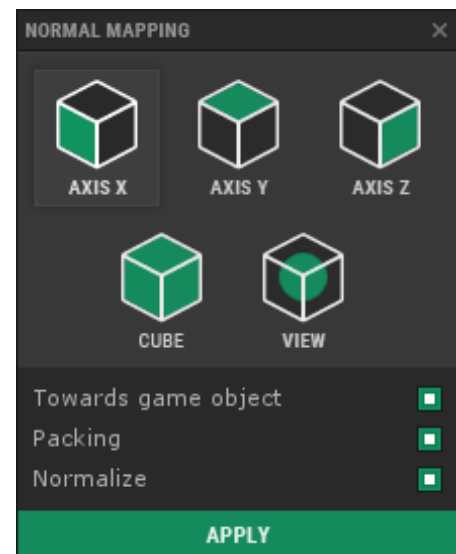- Normalize - if enabled, the result will be placed within the texture space.
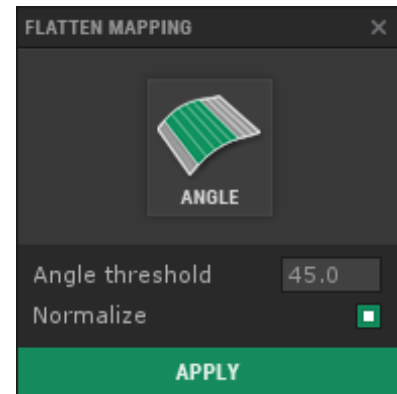
7.1.5.2 Normal mapping

Normal mapping is the method of procedure generation of texture coordinates, which creates elements of polygons by projecting them onto the specified axis.

Clicking opens a dialog where you can specify following settings:

- Projection type

  ➢ Axis X, Y, Z - All edges are projected onto a certain axis;

  ➢ Cubic - Polygons are separated into six groups by the least angle to each side of the cube, and are then projected along the normal of the corresponding side of the cube;

  ➢ Defined by the scene view - All vertices are projected along one axis, which is equal to the camera direction of the scene view (the scene view window should be open).

- Along the game object - if enabled, the projection will be relative to the position of the object on the scene;

- Packaging – if enabled, result will be packaging;

- Normalize – if enabled, result will be fit to the texture space.

7.1.5.3 Unfold mapping

Unfold mapping is the method of procedural generation of texture coordinates, which tries to unfold the model into the plane. This method excludes texture distortion, but the result can contain overlapping of texture coordinates and a lot of seams.

Clicking opens a dialog where you can specify following settings:

- Normalize – if enabled, result will be fit to the texture space.
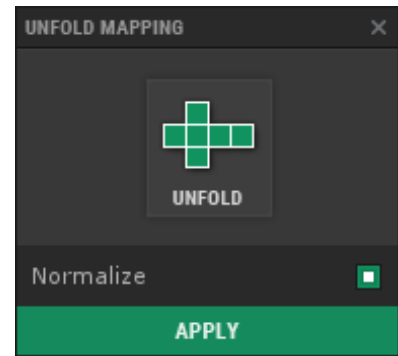
7.1.6 Selection

Contains the functions which change current selection:

- Invert selection

- Expand selection

    Expand current selection by adding sub-elements on the edges of selection

- Shrink selection

    Shrink current selection by removing sub-elements at the edges of selection
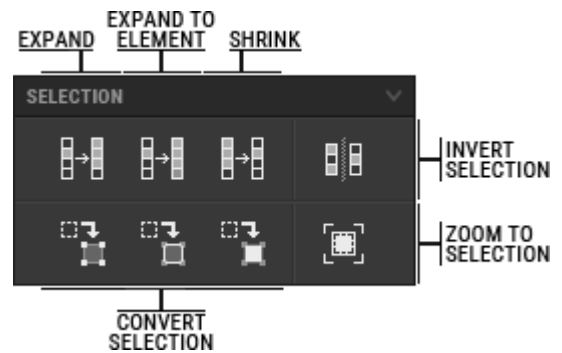
- Zoom to selection

    Zoom working area to the current selected sub-elements

- Convert selection to vertices / edges / polygons

    Selection can be convert into sub-element of different types, if it possible

- Expand selection to elements

    Expand current selection to whole elements.
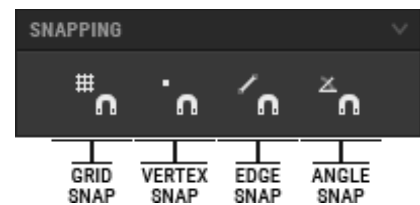
7.1.7 Snap

One or more types of snapping can be enabled:

- Snap to grid

    When enabled, moving sub-elements tends to snap the vertex, which closest to the mouse, to the nearest grid intersection. Grid size may be changed in the settings tab.

- Snap to vertex

    When enabled, moving sub-elements tends to snap the vertex, which closest to the mouse, to the nearest not selected vertex.

- Snap to edges

  When enabled, moving sub-elements tends to snap the vertex, which closest to the mouse, to the nearest not selected edge.

- Snap to angle

  When enabled, sub-elements will rotating only at certain angles. Angle can be set in the settings tab.

7.1.8 Visibility and freezing

Panel contains the following functions:

- Show

  Shows all hidden objects

- Hide

  Hides selected objects. Please note that regardless of visibility, sub-elements can still be changed.

- Freezing
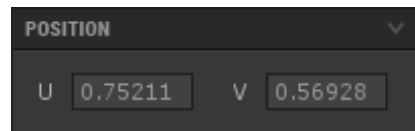
  Freezes the object. A frozen object cannot be moved.

- Unfreezing

 Unfreezes all previously frozen objects.

7.1.9 Position

This panel shows the exact position of the selected sub-element. You can also specify the position by entering coordinates.
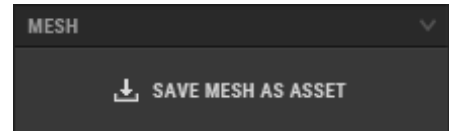
7.2 ADDITIONAL TOOLS

7.2.1 Render

With this tool you can render UV to texture. You can specify the width and height of the texture, and the color of the background. Available image formats: raster format PNG, or vector format SVG.
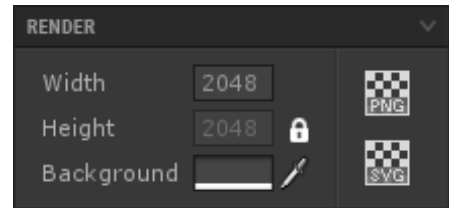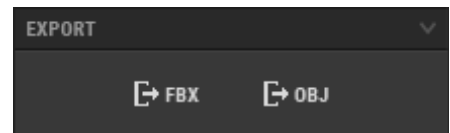
7.2.2 Mesh

With this tool you can save the mesh as a separate asset.

7.2.3 Export

With this tool you can export the model to the FBX or OBJ formats.

Note: this tool currently has serious limitations, and some information may be lost during the export.

7.2.4 About

In this panel you can:

- See the current version of the QUVEditor;
- Go to the plugin page at the Unity Asset Store;
- Go to the plugin website;
- Send an email to the author;
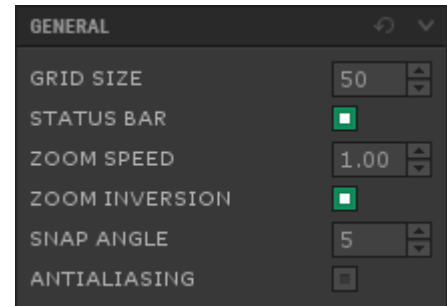- Go to the author's profile at the Unity Asset Store.
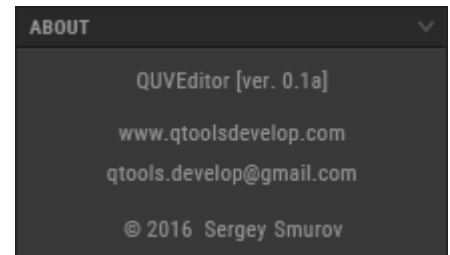
7.3 SETTINGS

7.3.1 General

In this panel you can:

- Set the grid size;

- Show / hide the status bar;

- Change zoom speed and direction;

- Specify the angle to which snaps will occur when "Snap to angle" is enabled;

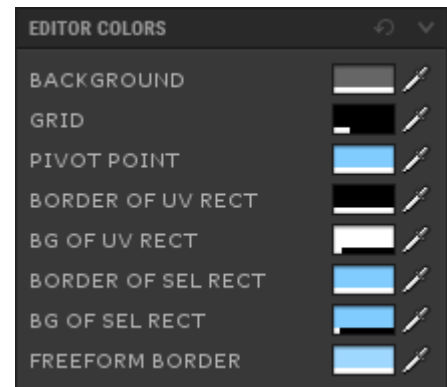- Enable / disable anti-aliasing.

You can also set all these parameters to default by using the button in the top right corner.

7.3.2 Editor colors

In this panel you can customize editor colors for the following elements:

- background;

- grid;

- pivot point;

- border of the texture space;

- background of the texture space;

- the border of the selecting rectangle;

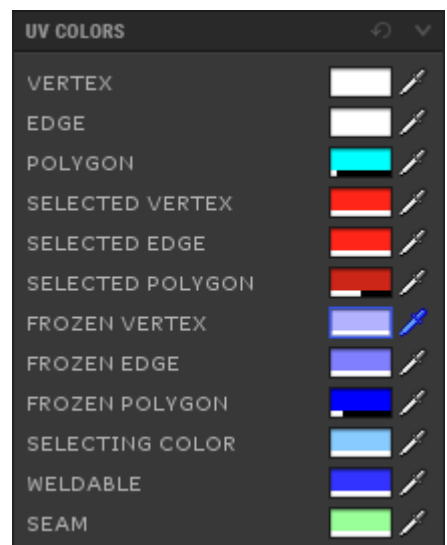- the background of the selecting rectangle;

- freeform border.

You can also set all these parameters to default by using the button in the top right corner.

7.3.3 UV Colors

In this panel you can customize UV colors for the following elements:

- vertex, edge and polygon;

- selected vertex, edge and polygon;

- frozen vertex, edge and polygon;

- sub-elements in the selected area;

- sub-elements that may be welded with currently selected sub-elements;
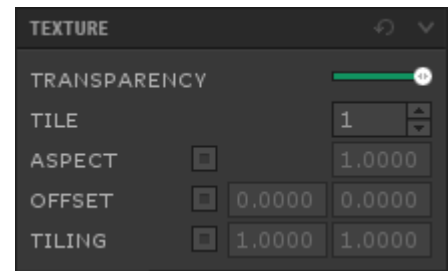
- seam.

You can also set all these parameters to default by using the button in the top right corner.

7.3.4 Texture

In this panel you can configure texture appearance:

- Transparency;

- Tile (repeating the texture that is displayed outside the texture space);

- Aspect;

- Offset;

- Tiling.

By default, the aspect value is equal to the aspect of the texture, and the offset and tiling values are used from the material of the object.

You can also set all these parameters to default by using the button in the top right corner.