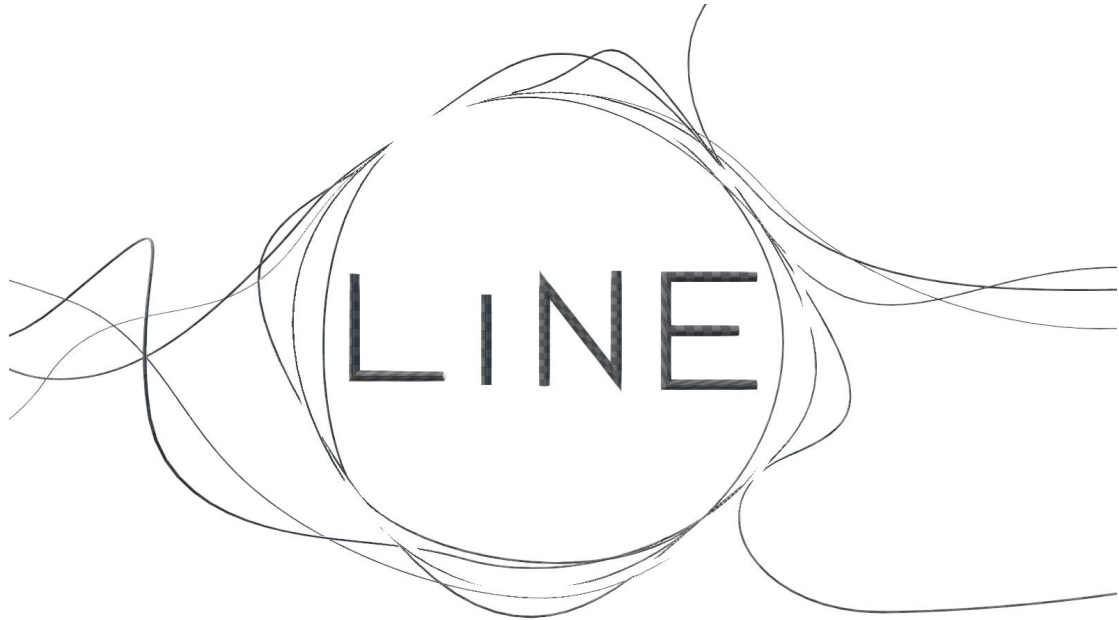


# Manual for SplineMesher v1.0



## Contents

- 1 Getting started
- 2 System options
- 3 Script examples

THANK YOU FOR YOUR PURCHASE!

## 1 Getting started

### 1-1 GETTING STARTED - Install SplineMesher

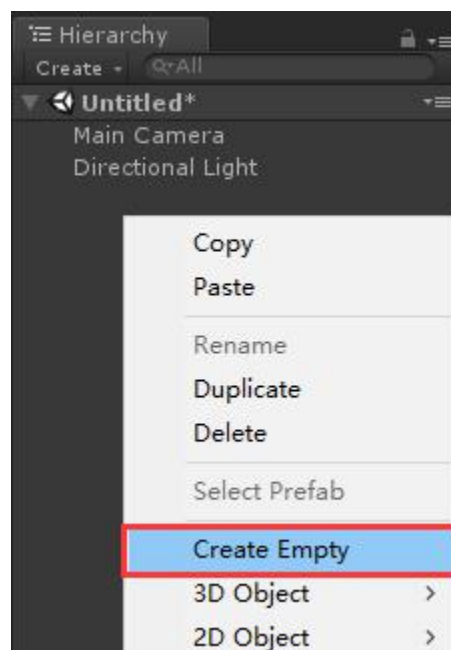
Download and import SplineMesher from Asset Store, and you will see following files:



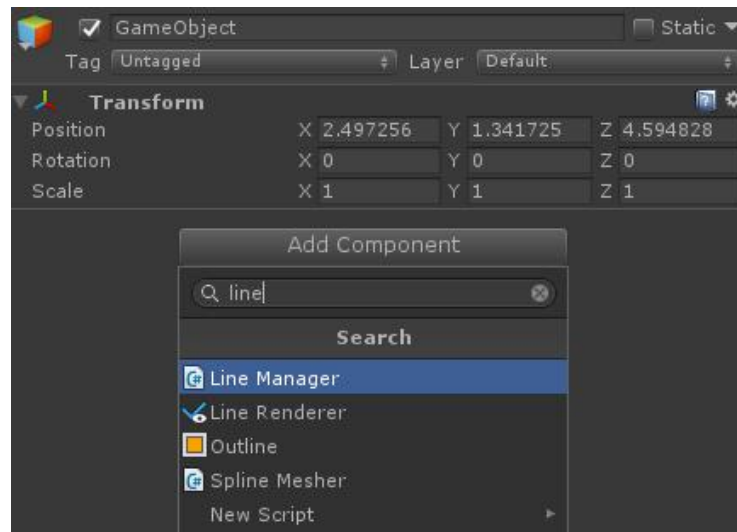
There are some example scenes in the 'ExampleScenes' folder to help you quickly learn how to use SplineMesher.

### 1-2 GETTING STARTED – How to use (quick tutorial)

**STEP1** : First, create an empty gameobject in you scene:

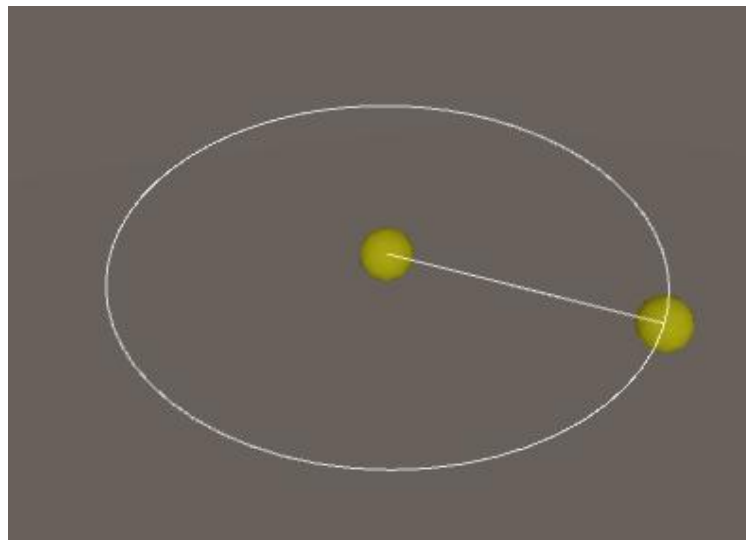


**STEP 2 :** Select your empty gameobject, then search for 'Line Manager' component in the inspector and add the component:



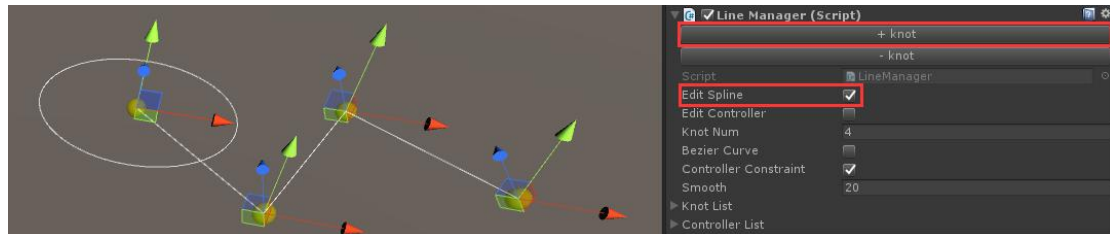
**STEP 3 :** Now you can see the spline in your scene, the white straight lines represents the spline, and the yellow balls represents the vertices (knots) of the spline, and they will inherit the transform of your empty object.

\*White circle represents the pivot of the empty object.



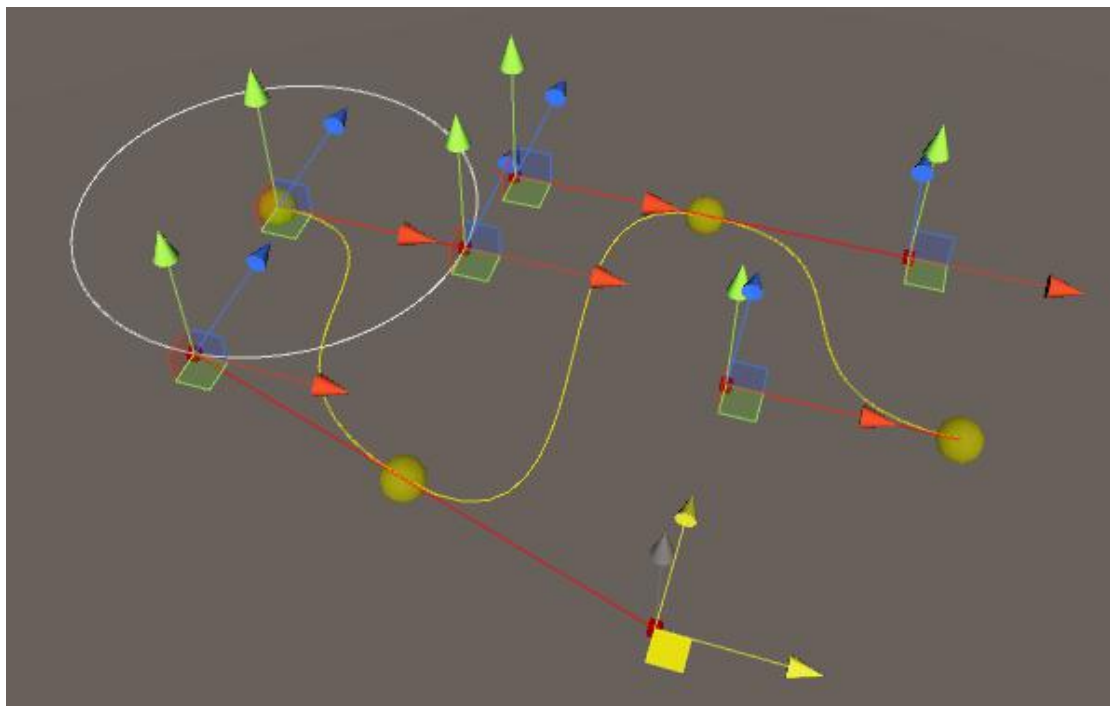
**STEP 4 :** You can add new knot to the spline by clicking the '+ knot' button in the inspector.

Tick the 'Edit Spline' checkbox in the inspector and you will see handles of each knots appear in the scene, then you can edit the spline by using these handles.

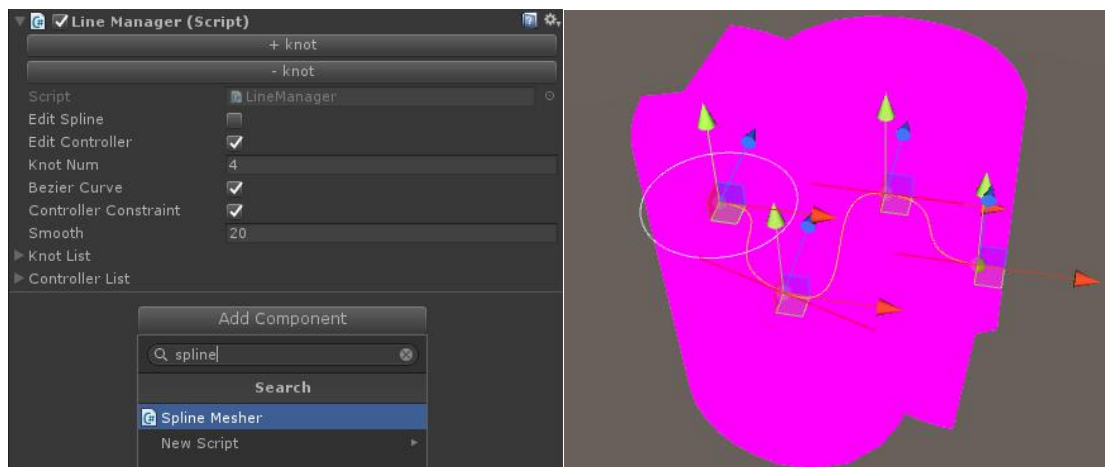


**STEP 5 :** Tick 'Bezier Curve' and the corner spline will be converted to Cubic Bezier curve, then tick the 'Edit Controller' you will be able to edit the Bezier controllers of each knot.

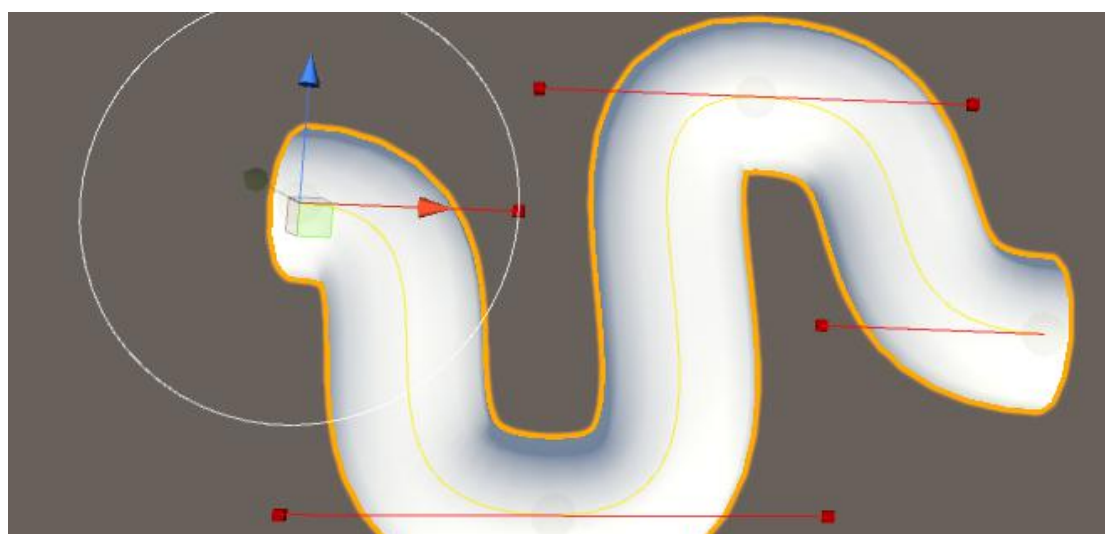
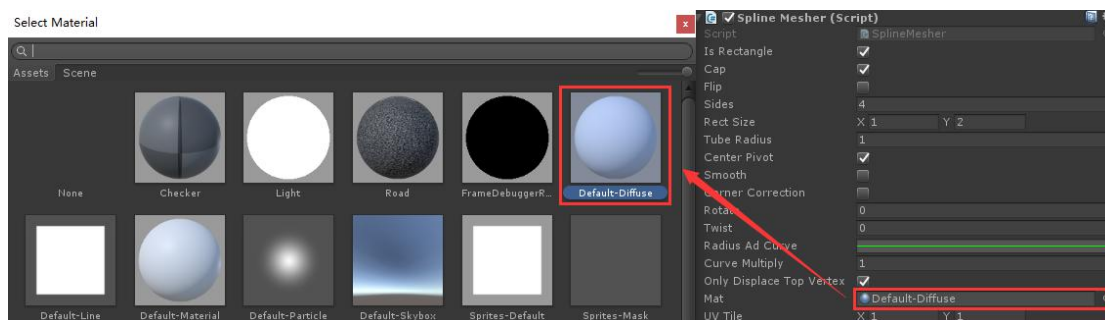
Then you can try to tick the 'Controller Constraint', it means that the two Bezier handles corresponding to the same knot are limited to one straight line (so that they will have same tangent vector, and the spline will keep 'smooth' at the position of that knot).



**STEP 6 :** Search for 'Spline Mesher' component in the inspector and add it to your empty gameobject which you have added 'Line Manger' to it before, then you will see a 'strange' pink model appear in your scene:



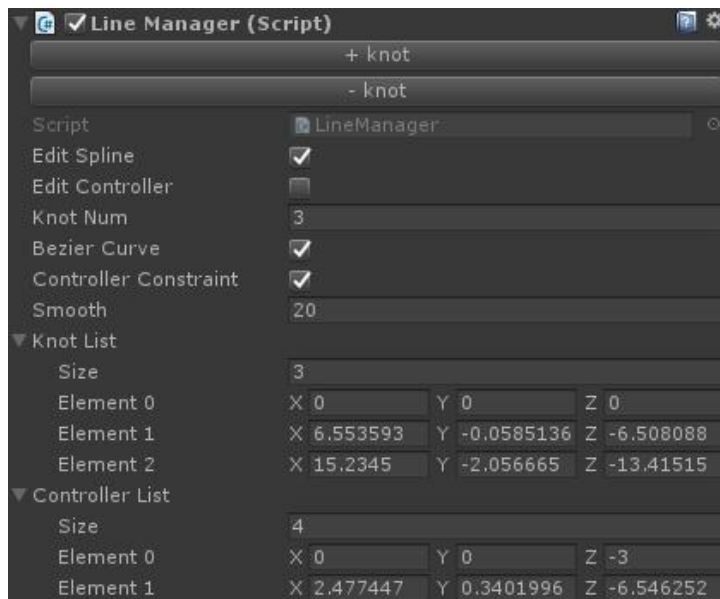
**STEP 7 :** That's because we haven't added a material to the spline mesh yet. Just click the 'Mat' in 'Spline Mesher' component and select a material, then the material will be applied to the mesh automatically:



**STEP 8 :** Congratulations! You have learned the basics. For more detailed parameter descriptions, please refer to the following sections 2 and 3.

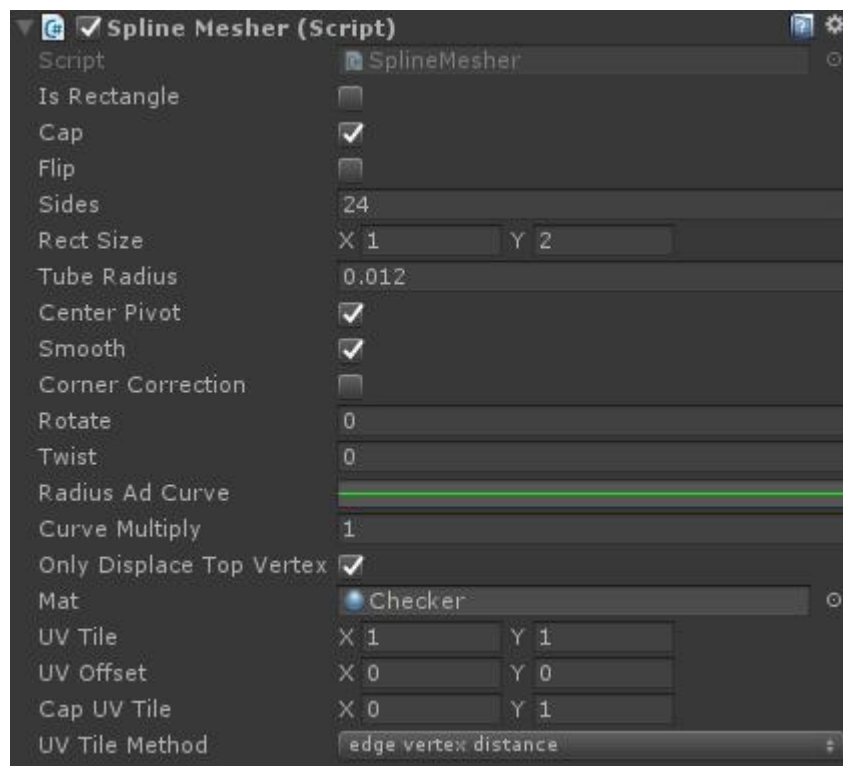
## 2 System options

### 2-1 SYSTEM OPTIONS – Line Manager component



Parameter	
+ knot / - knot	Add/delete knot from the spline.
Edit Spline	Turn it on to show the handles of spline knots.
Edit Controller	Turn it on to show the handles of Bezier controllers of each knot.
Knot Num	It shows the total knot number of the spline, you can change it directly and the spline will be updated in realtime. <i>* minimum knot number is 2</i>
Bezier Curve	Turn it on to convert the corner spline to Cubic Bezier curve.
Controller Constraint	Turn it on and the two Bezier handles corresponding to the same knot will be limited to one straight line.
Smooth	The higher, the smoother the Bezier curve will be. <i>* maximum smooth level is 255, you can change it in source code of the component</i>
Knot List	It shows the coordinates of spline knots, you can change it directly in the inspector. <i>* coordinates are shown in local coordinate space</i>
Controller List	It shows the coordinates of Bezier controllers, you can change it directly in the inspector. <i>* coordinates are shown in local coordinate space</i>

## 2-2 SYSTEM OPTIONS – Spline Mesher component

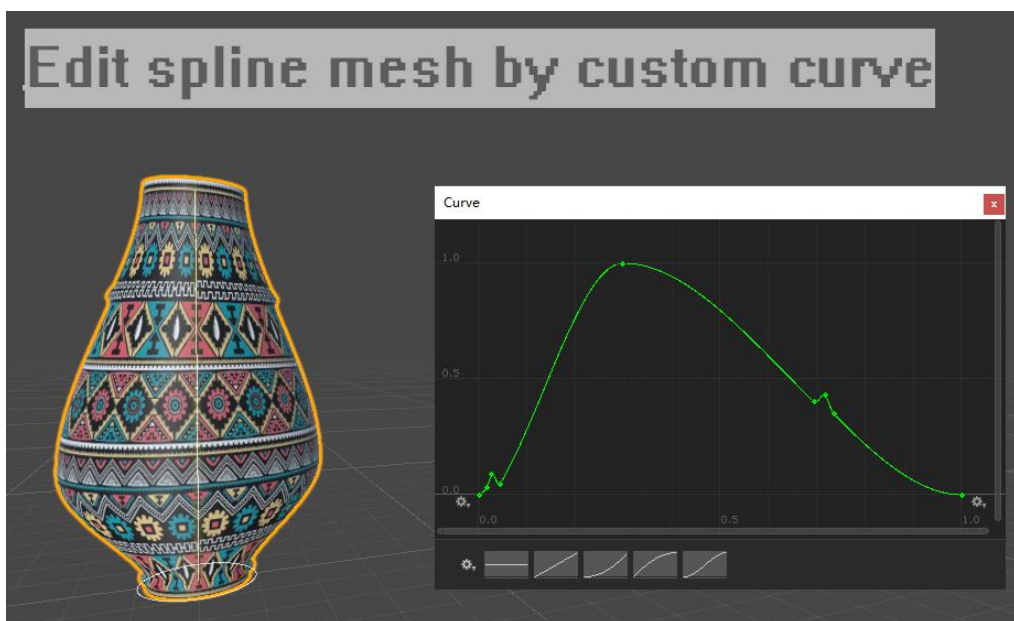
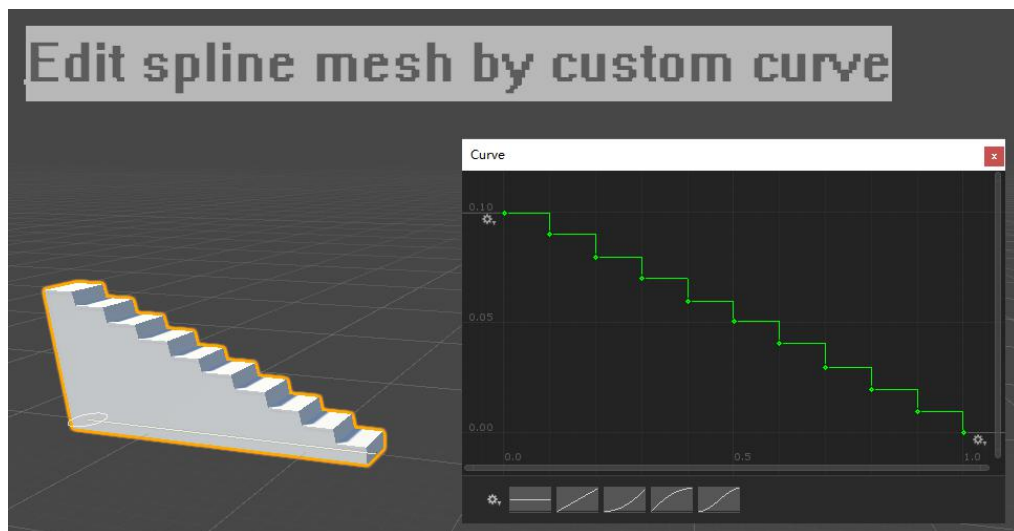
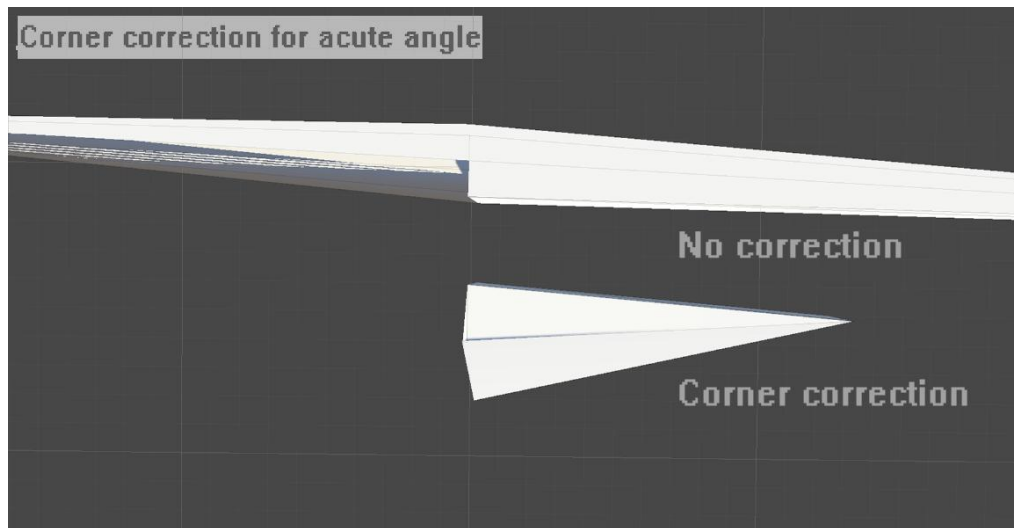


Parameter	
Is Rectangle	Switch the section type of generated tube mesh (radial and rectangular).
Cap	Whether cap the top and bottom face of generated tube mesh.
Flip	Flip the normal of side faces of generated tube mesh. (It can be used to create tunnels, etc.)
Sides	The number of edges of the section polygon of tube mesh.
Rect Size	Width and length of section rectangle if section type is set to rectangular.
Tube Radius	Radius of section radial polygon if section type is set to radial.
Center Pivot	Turn it on to put pivot of each section to the bottom of the section.
Smooth	Switch the display method of the side faces of the tube mesh. If checked, the side will be displayed smoothly.
Corner Correction	If the angle between two spline segments is very small, some vertices of the generated tube mesh may erroneously deviate from the mesh. Checking it can largely repair the problem.

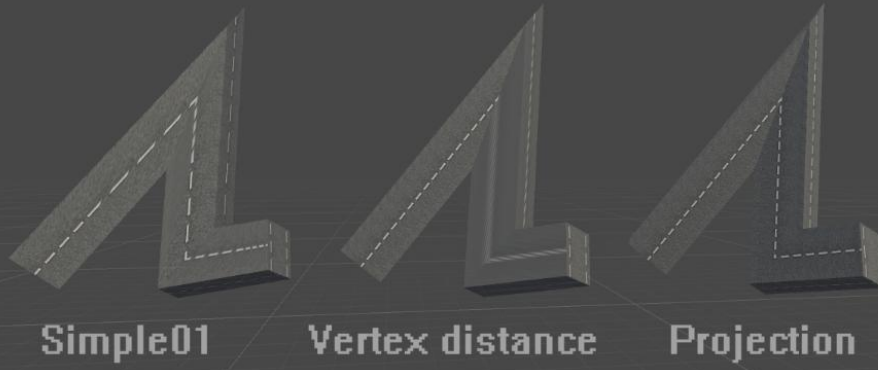
Parameter	
Rotate	Taking the spline as axis center to rotate the tube mesh.
Twist	<p>The rotation angle of each segment of tube mesh is multiplied by an adjustment coefficient.</p> <p>The closer the segment is to the end of the spline, the greater the adjustment coefficient is.</p>
Radius Ad Curve	<p>Adjust radius of each tube mesh segment by using custom curve.</p> <p><b>* the abscissa of the curve must be between [0,1]</b></p>
Curve Multiply	The value of the 'Radius Ad Curve' will be multiplied by this coefficient.
Only Displace Top Vertex	If turn it on, only the vertices of top faces (normal of these faces are close to (0,1,0)) will be adjusted by 'Radius Ad Curve'.
Mat	Material of generated tube mesh.
UV Tile	UV tile of generated tube mesh.
UV Offset	UV offset of generated tube mesh.
Cap UV Tile	<p>The 'x' component of 'Cap UV Tile' is used to rotate the UV of top and bottom faces of tube mesh.</p> <p>The 'y' component of 'Cap UV Tile' is used to rescale the UV of top and bottom faces of tube mesh.</p>
UV Tile Method	<b>'Simple01'</b> : The vertex UV of the top position of the spline is set to (0,0), and the vertex UV of the tail is set to (1,1).
	<b>'Edge vertex distance'</b> : The UV position of the vertex is calculated based on the cumulative distance between each segments of the spline.
	<b>'Projection'</b> : Each triangle of the mesh will firstly be projected into a virtual plane which its normal points, and then the UV is calculated.



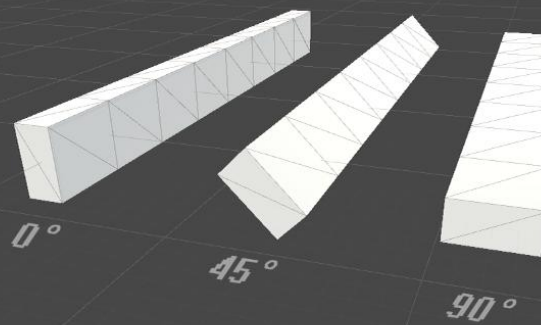
## 2-3 SYSTEM OPTIONS – Legend of some parameters



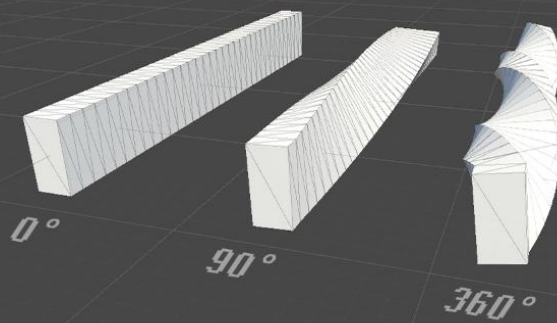
## Different UV tile method



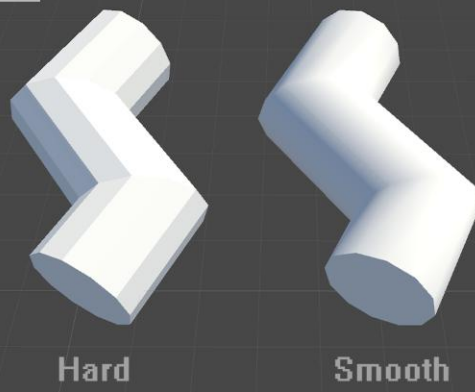
## Rotate



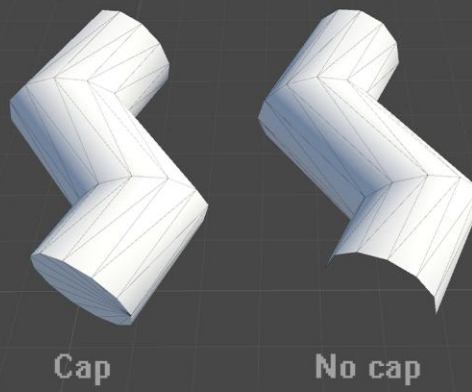
## Twist



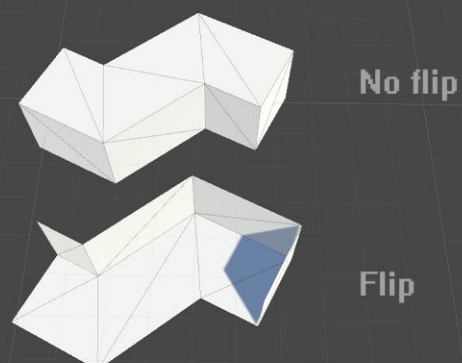
### Different display mode



### Cap the top and bottom



### Flip normal of side faces



### 3 Script examples

#### 3-1 SCRIPT EXAMPLES – Create spline and tube mesh

```
// create empty gameobject
GameObject splineMesh = new GameObject();
splineMesh.name = "spline mesh";

// add components to the empty gameobject
lineMgrComp = splineMesh.AddComponent<LineManager>();
spMeshComp = splineMesh.AddComponent<SplineMesher>();

// add knot to spline
lineMgrComp.knotNum++;
// *** update is needed ***
lineMgrComp.ManualUpdate();

// change position of the knot which we added above
// get knot list first
List<Vector3> knotList = lineMgrComp.GetLineKnots();
knotList[knotList.Count - 1] = knotList[knotList.Count - 2] + Vector3.up;
// *** update is needed ***
lineMgrComp.ManualUpdate();

// assign material to spline mesh
spMeshComp.mat = matForMesh;

// set other parameters of spline mesh
spMeshComp.isRectangle = false;
spMeshComp.tubeRadius = 0.5f;
spMeshComp.sides = 24;
```

### 3-2 SCRIPT EXAMPLES – Caculate normal、tangent and bitangent for custom spline

```
// create a list for your spline
List<Vector3> mySpline = new List<Vector3>();
mySpline.Add(Vector3.zero);
mySpline.Add(new Vector3(0, 0, 1));
mySpline.Add(new Vector3(0, 0, 2));
mySpline.Add(new Vector3(0, 1, 2));

// prepare normal, tangent and bitangent list
List<Vector3> normal = new List<Vector3>();
List<Vector3> tangent = new List<Vector3>();
List<Vector3> bitangent = new List<Vector3>();

// calculate normal, tangent and bitangent for each vertex
// results will be stored to above lists
MathUtils.CalcVectors(mySpline, ref normal, ref tangent, ref bitangent);

// debug result
foreach (Vector3 vt in normal) Debug.Log(vt);
```

THANK YOU FOR YOUR PURCHASE!



### **SplineMesher – Procedural spline mesh tool**

Copyright 2019 HU ANIME

Version 1.0.0

Thank you for buying SplineMesher and supporting HU ANIME!

It's people like you that allow me to build and improve my indie games!

If you have any questions, comments, or requests for new features, please email me directly at:  
[hztmailbox@gmail.com](mailto:hztmailbox@gmail.com).