

Extrude Mesh Along Bézier Tool Documentation

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About the software

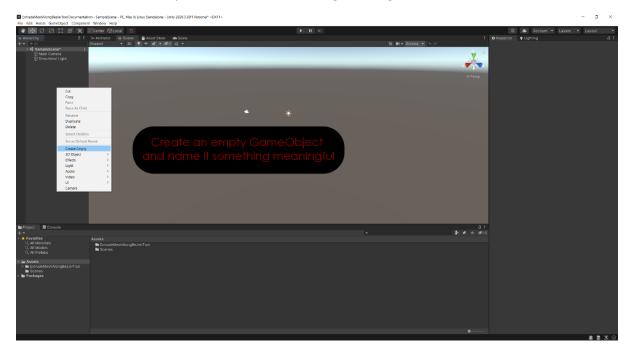
Extrude Mesh Along Bézier Tool is a free asset for Unity created in 2022 by Magnus Söderberg. The purpose of the software is to facilitate the process of extruding a mesh along a curve. The asset can be used for educational or commercial purposes.

The current version does not contain any functionality to travel along the mesh, but this can be included in future releases if requested.

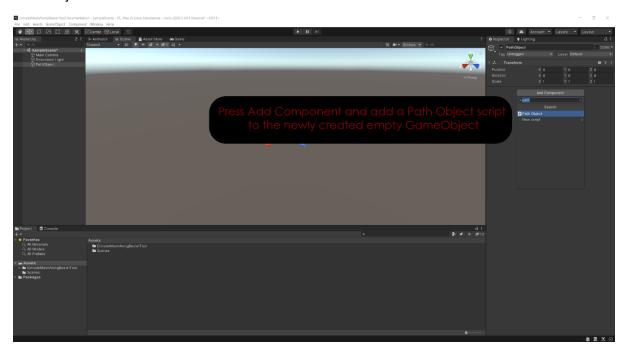
All code used in the asset is fully exposed in the asset as scripts and any changes to the code is encouraged. The scripts can be found in the folder Scripts and Editor.

How to get started

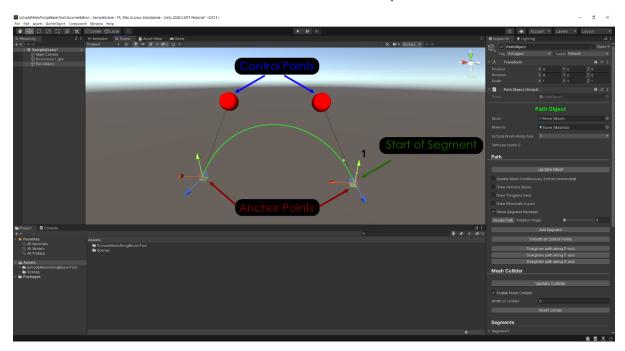
1) Create a new GameObject and name it something meaningful.



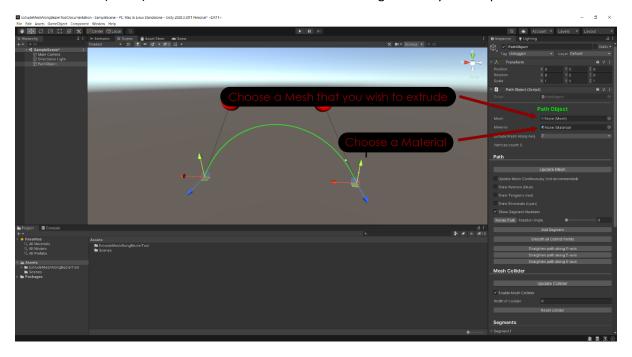
2) Press *Add Component* in the inspector and add a *Path Object* script to the newly created GameObject.



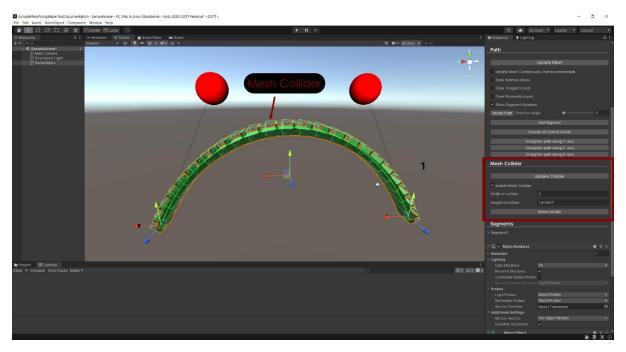
3) This will create an empty Bézier curve (green curve). A Bézier curve is comprised of four points: two *Anchor Points* and two *Control Points*. The Anchor points are located at the start and end of the curve and have translational Gizmos attached to them, which allows them to be moved around. The Control Points have red spheres surrounding them so that they can be moved. Experiment moving the Control Points or Anchor Points to see the effect on the shape of the Bézier curve.



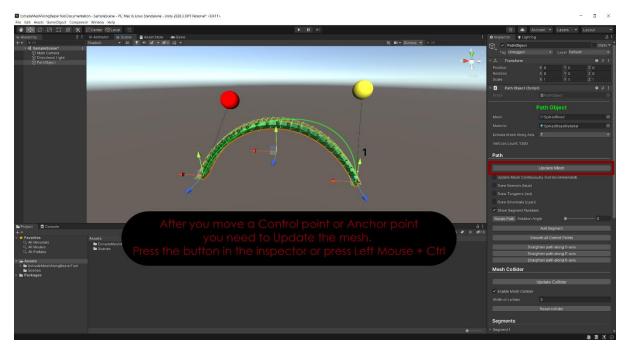
4) To add a mesh to extrude along the Bézier, simply select a mesh and a material in the inspector. There are several meshes to test included in this asset (for example SpikedRoad). Note that you must choose both a mesh and a material for the mesh to be shown. Make sure you select the correct *Extrusion Axis* (Z or X) to ensure that the mesh extrudes along the axis you except.



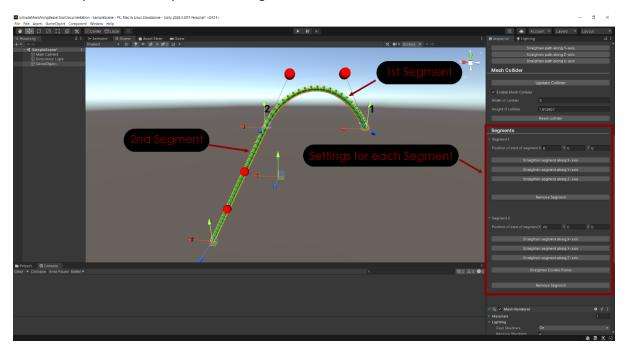
5) The script also adds a *Mesh Collider* by default that can be seen as the light-green wire frame encapsulating the mesh. The Mesh Collider is there to enable physics interactions between the mesh and some other GameObject. The Mesh Collider can be disabled by unchecking Enable Mesh Collider. The size of the Mesh Collider can also be changed here.



5) When you move either an Anchor Point or Control Point, the Bézier curve will respond to the movement but the mesh remains in its previous position. To update the mesh to follow the new shape of the Bézier curve, press *Update Mesh or Left Mouse Button + Ctrl* (respective key on Mac) while hovering mouse in SceneView.



6) A single Bézier curve does not allow for much flexibility in the shape of the mesh, so additional segments are needed. Press *Add Segment or Left Mouse Button + Shift* while hovering the mouse in the SceneView to add another segment. The newly created segment will be using the tangents of the previous points, i.e, it will continue in a straight line. Each Segment is a new Bézier curve and the position of the start of each Segment has a number above it. In the bottom of the inspector that concerns the Path Object script component, the settings of each segment can be adjusted. Here is also where you remove any unwanted Segments.



7) A problem that might occur is that the mesh might have an unnatural look at certain points. This is often caused by moving the Anchor Points around while not correcting the tangent using the Control Points. To smooth out these problems for all Segments press **Smooth all Control Points** which will match the tangent of the Control Points around each Anchor Point. You can also do this for just one Segment by pressing Straighten Control Points under the respective Segment section.



All Settings

- Mesh The mesh to be extruded
- Material The material used for the mesh
- Extrude Mesh Along Which axis the mesh is extruded along in local position
- Vertices count How many vertices the entire mesh uses.

Path

- Update Mesh (button) updates the position of the mesh according to the shape of the Bézier.
- **Update Mesh Continuously (check box)** Same as Update Mesh button but for every time the position of the Bézier changes. This can be quite slow for larger meshes and therefore not recommended.
- **Draw Normals (check box)** Shows the normals, as blue lines, of each point on the Bézier curve that the mesh uses.
- **Draw Tangents (check box)** Show the tangents, as red lines, of each point on the Bézier that the curve that the mesh uses.
- **Draw Binormals (check box)** Show the binormals, as cyan lines, of each point on the Bézier that the curve that the mesh uses.
- Show Segment Numbers (check box) Shows the numbers above the start of each Segment
- Rotate Path (button) Rotates the entire mesh according to the Rotation Angle set.
- Add Segment (button) Adds a new Segment at the end. Can also be done with Left Mouse
 + Shift.
- **Smooth All Control Points (button)** Puts all Control Points in the entire Bézier curve in a straight line to smooth out sharp turns in the mesh.
- **Straighten path along Y-axis (button)** Puts all points of the Bézier curve on the same Y-coordinate as the first Anchor Point.
- Straighten path along Z-axis (button) Puts all points of the Bézier curve on the same Z-coordinate as the first Anchor Point.
- **Straighten path along X-axis (button)** Puts all points of the Bézier curve on the same X-coordinate as the first Anchor Point.

Mesh Collider

- **Update Collider (button)** Updates the collider to changes of the Bézier curve. When you have the Mesh Collider enabled it will update automatically when you update the mesh.
- Enable Mesh Collider (check box) Whether to use a mesh collider
- Width of collider Changes the width of the Mesh Collider
- Height of collider Changes the height of the Mesh Collider
- Reset Collider (button) Resets the size of the Mesh Collider to the default values.

Segments

 Position of start of segment (Vector3) – Set the start position of the Segment in world coordinates

- Straighten segment along X-axis (button) Changes the X-coordinates of all points of the segment to the same X-coordinates as the first Anchor Point of the segment.
- Straighten segment along Y-axis (button) Changes the Y-coordinates of all points of the segment to the same Y-coordinates as the first Anchor Point of the segment.
- **Straighten segment along Z-axis** (button) Changes the Z-coordinates of all points of the segment to the same Z-coordinates as the first Anchor Point of the segment.
- Remove Segment (button) Removes the Segment. Not possible if there is only one Segment.