

Ragdoll dismemberment system by Animus digital

Summary

This system allows to dismember any skinned mesh without additional preparation in external 3D software.

Features:

- This system is suitable for games with suit customization (when character consists from several skinned meshes, that can be equipped/unequipped in runtime).
- LOD group auto-duplication for fragments (if skinned mesh has LOD group)
- Hierarchical dismemberment (a dismembered arm can be dismembered again in elbow joint)
- Supports any kind of ragdoll (human, robot, animal etc.)
- Effects customization (broken electronics for robots, green meat for aliens etc.)

[Demo](#)

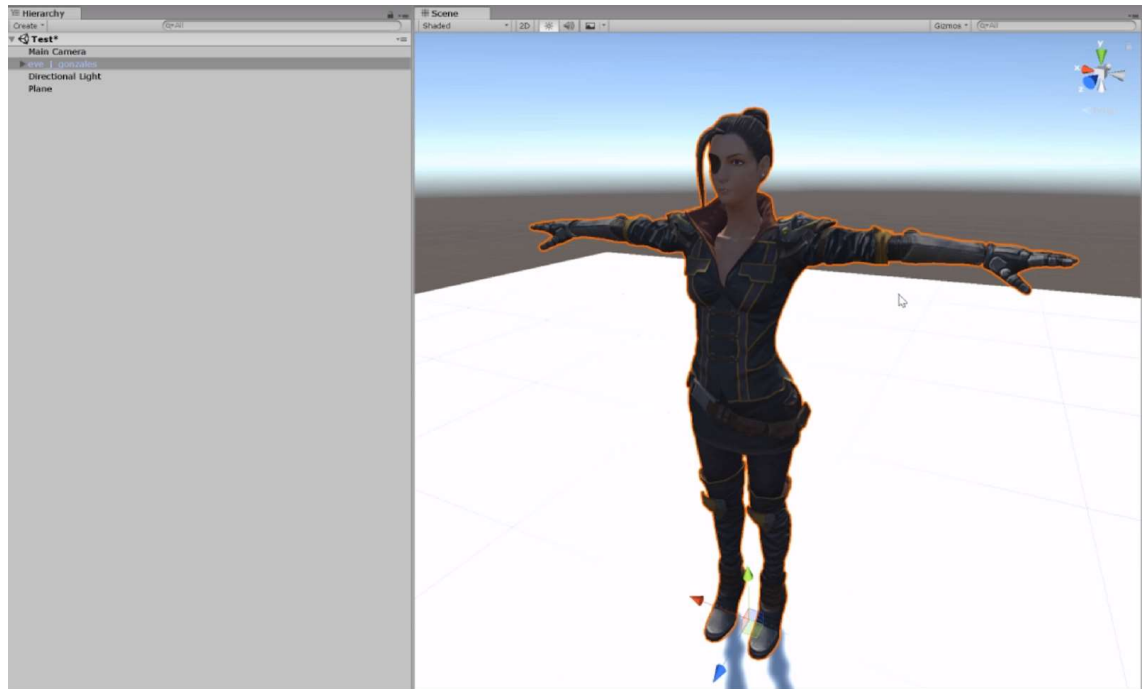
[Video tutorial](#)

If you have questions, please contact us info@animus.digital

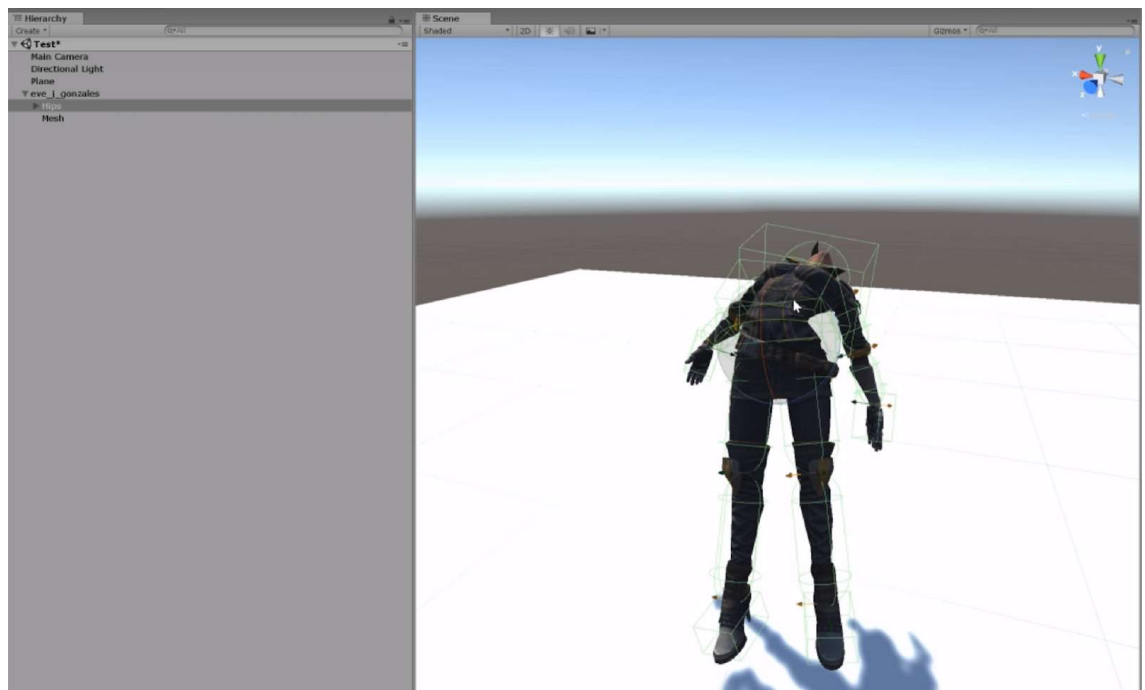
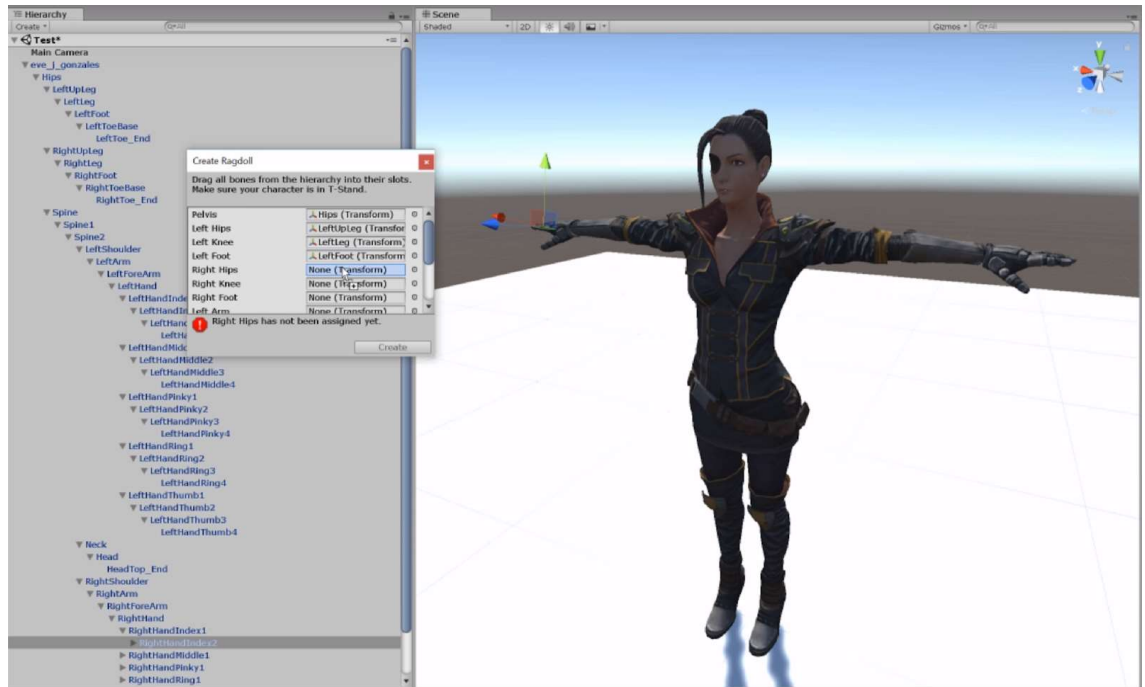
More info on our official site animus.digital

How to configure ragdoll for dismemberment

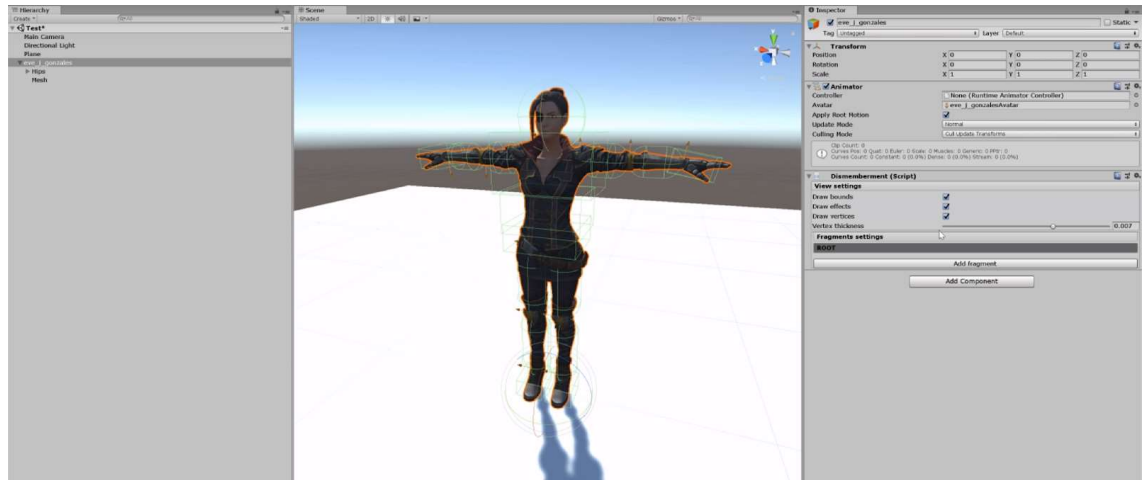
1. Import skinned mesh FBX file to Unity and drag it to the scene.



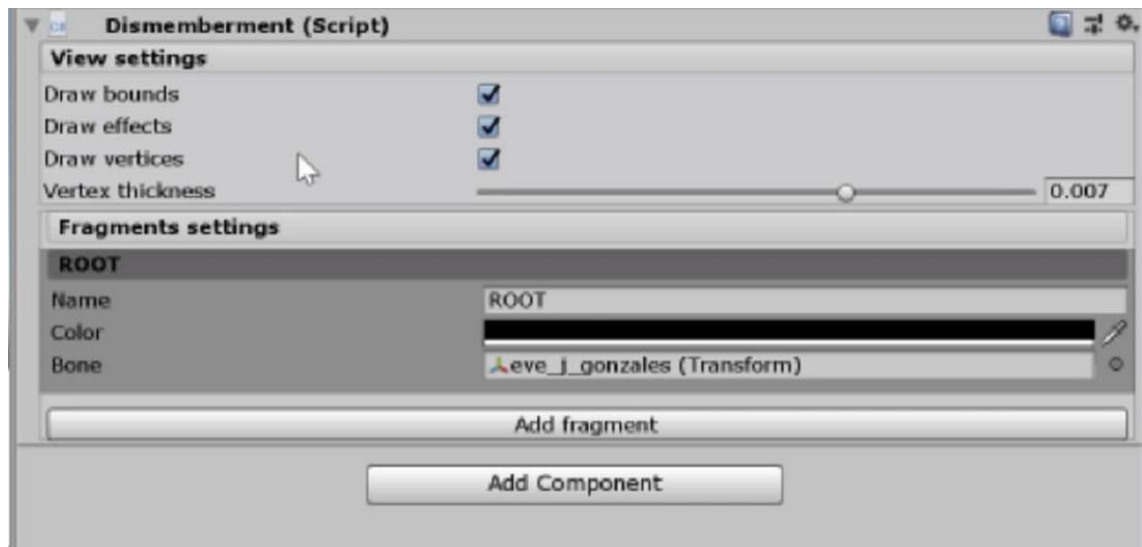
2. Make a ragdoll from skinned mesh (for example, using built-in Unity ragdoll wizard).



3. Attach Dismemberment component to root gameobject of skinned mesh

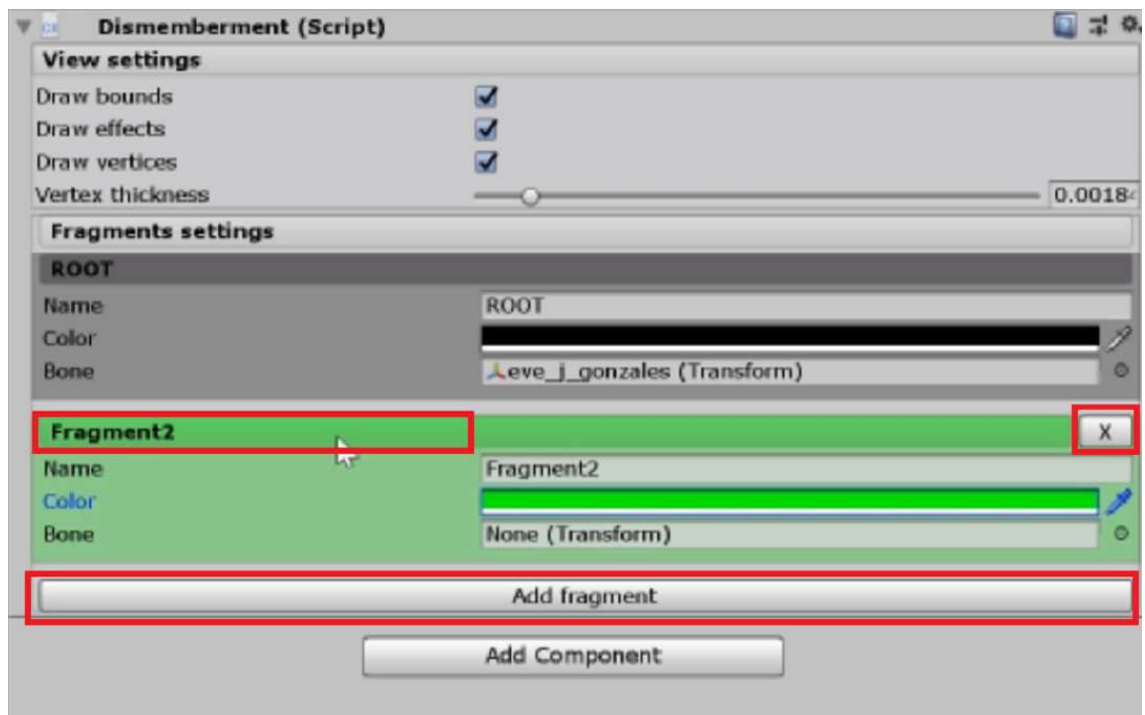


4. Now take a look on Dismemberment editor window. All settings are divided into View settings and Fragments settings. View settings allows to change visual representation of the editor. Fragments settings is the main editor part and it is responsible for all fragment properties (like bounds, effects etc).

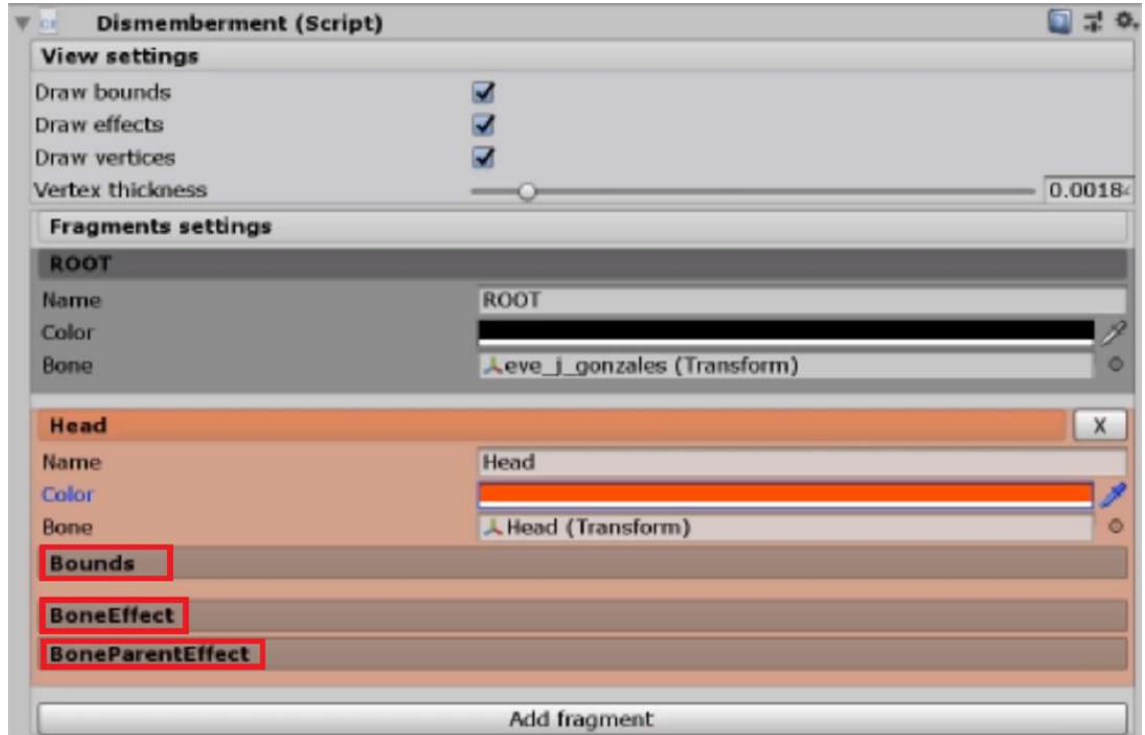


5. The root fragment is created by default and covers entire mesh. Only name, color and bone transform can be edited. Root fragment can't be deleted.
6. To add fragment, press "Add fragment" button. To remove fragment, press "X" button in top-right corner of fragment panel.

Click on the name of fragment to show/hide it's properties.

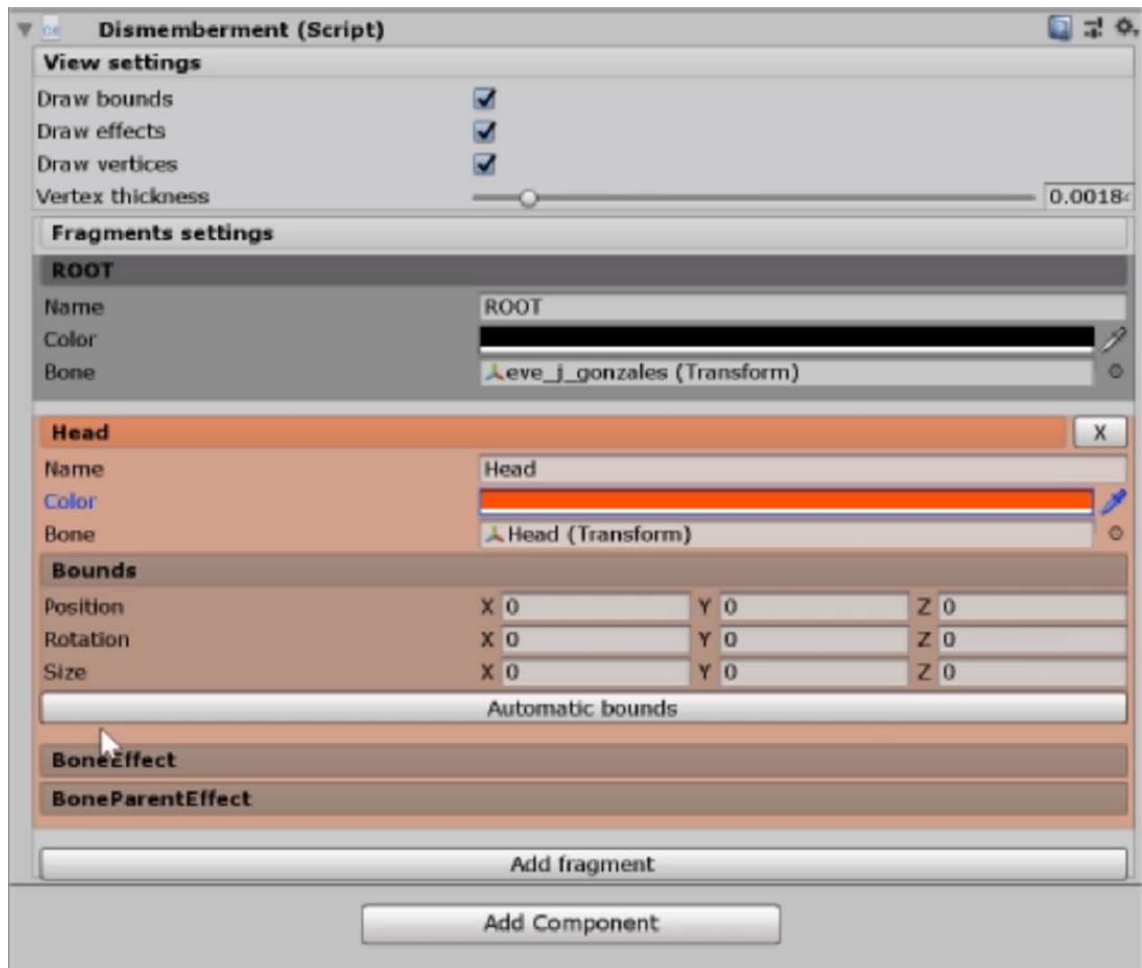


7. When bone transform is assigned, bounds and effects' subpanels will appear.



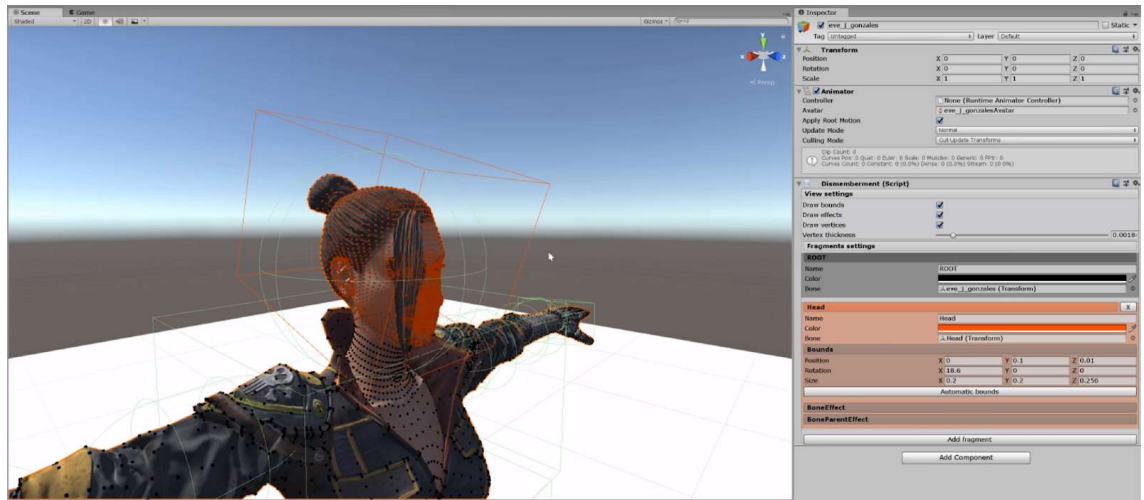
8. In bounds subpanel, there are position, rotation and scale parameters. Click on "Automatic bounds" button, and system will

try to calculate bounds, which will encapsulate collider, attached to bone transform.

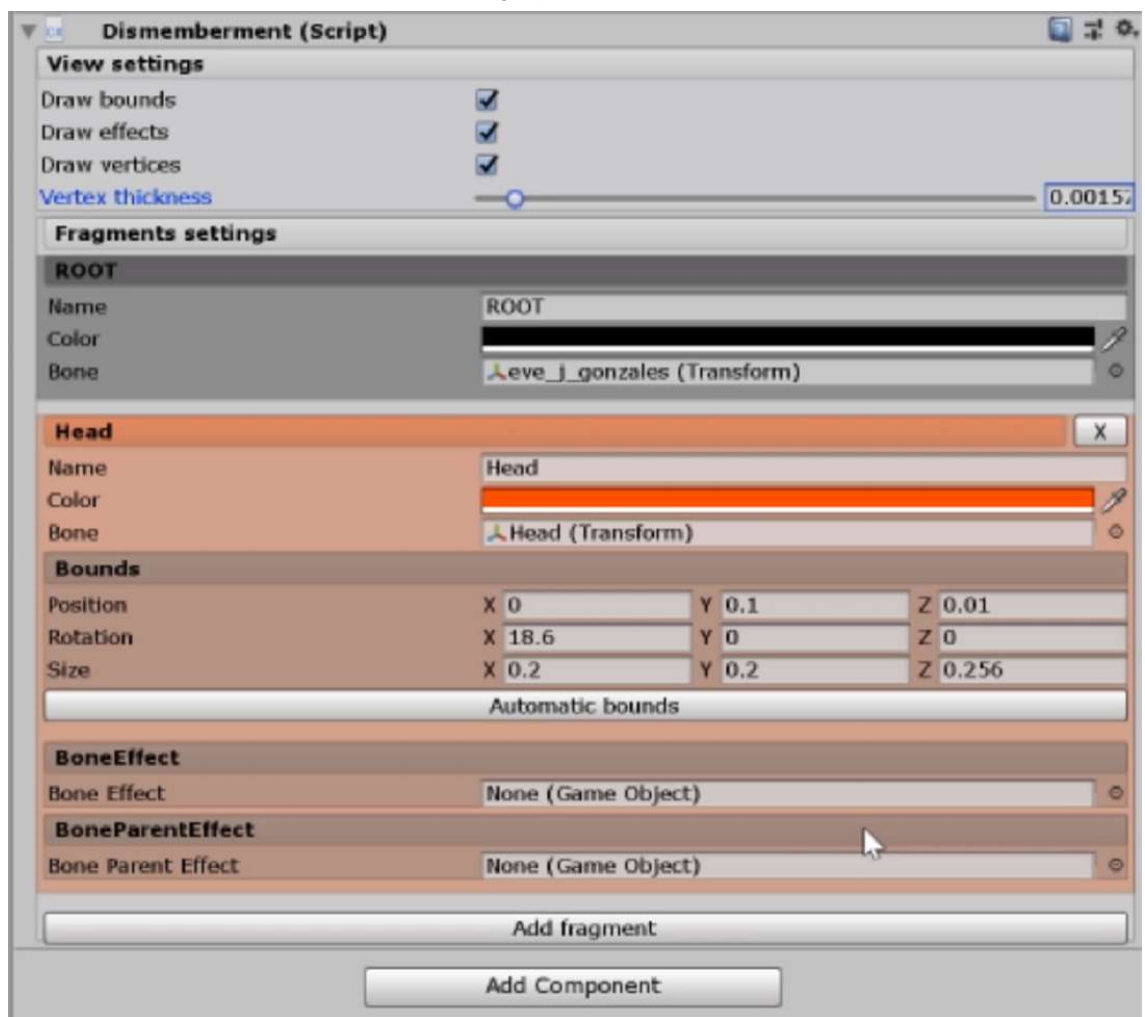


9. Fragment bounds must include all vertices, which will belong to dismembered fragment. Also, for better effect matching, we recommend to orient bounds along slice edge loop. For example,

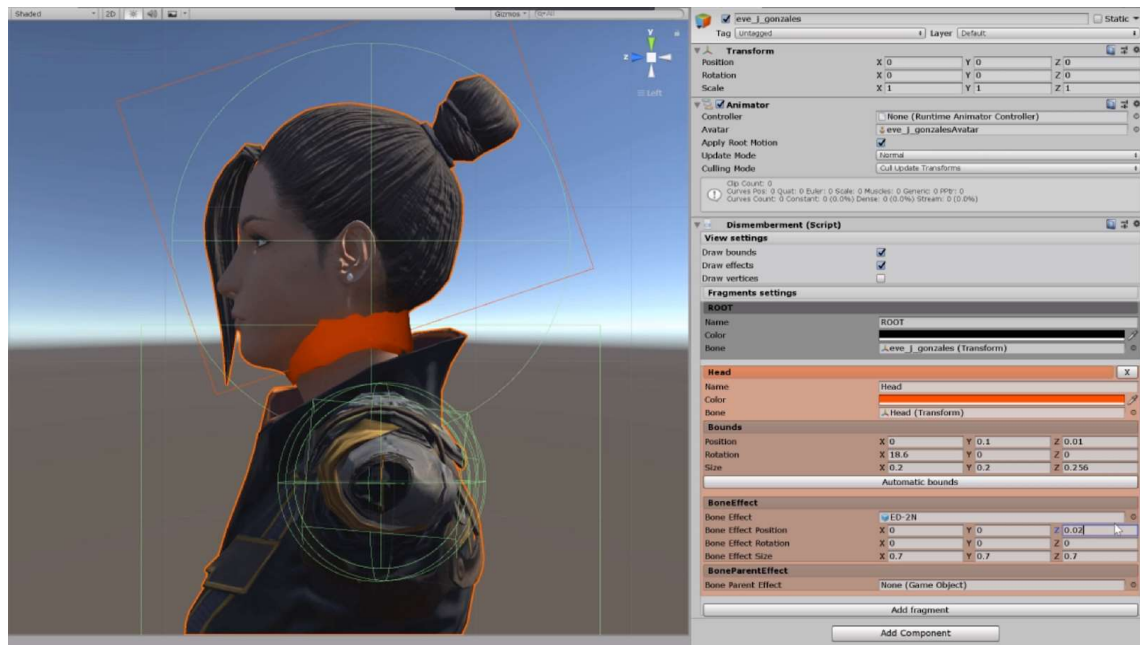
head bounds will look something like this



10. Every fragment has slot for bone effect and slot for parent bone effect. Effects are needed to fill gaps in sliced meshes.

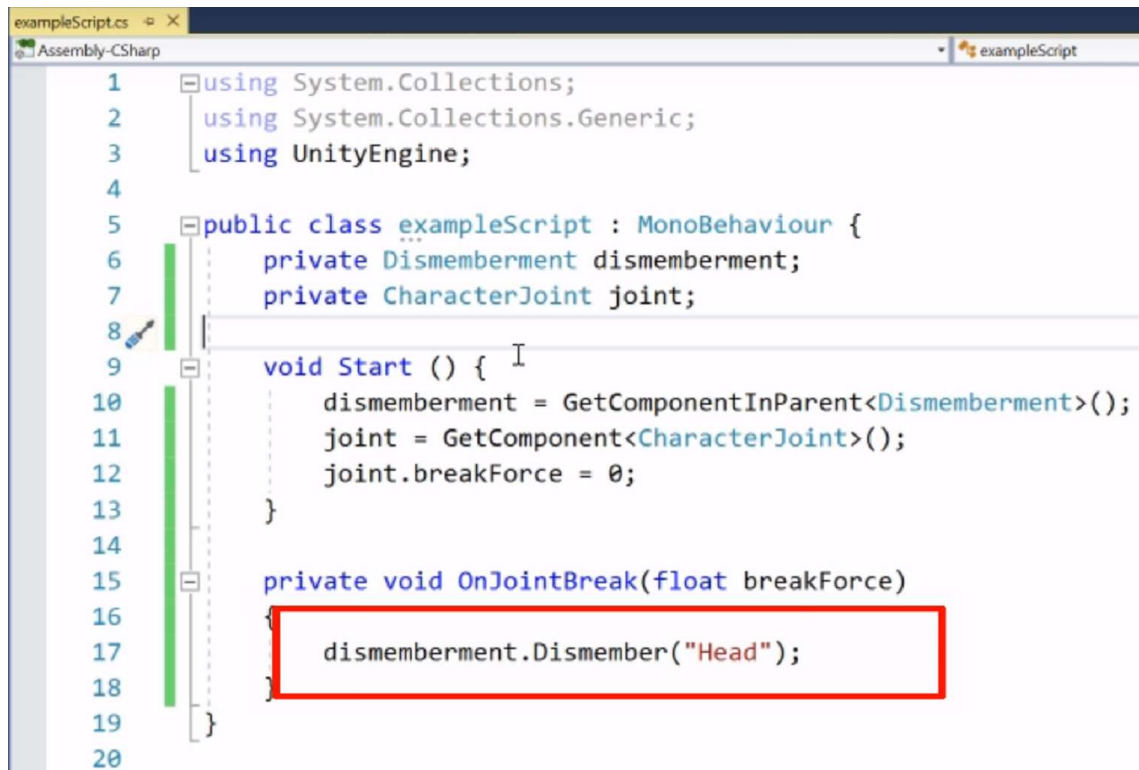


11. When effect is assigned, position, rotation and scale parameters will become editable. An effect will be displayed as mesh with the same color as corresponding fragment.



12. After fragment bounds and effects are configured, it's time to look at scripting part. To dismember fragment, simply call **Dismember(string name)** method from Dismemberment component. For example, a script below is attached to head and

breaks Joint which triggers head dismemberment.



The image shows a screenshot of a C# script named `exampleScript.cs` in the Visual Studio editor. The script is a `MonoBehaviour` class that implements a dismemberment system. It includes the following code:

```
1 using System.Collections;
2 using System.Collections.Generic;
3 using UnityEngine;
4
5 public class exampleScript : MonoBehaviour {
6     private Dismemberment dismemberment;
7     private CharacterJoint joint;
8
9     void Start () {
10         dismemberment = GetComponentInParent<Dismemberment>();
11         joint = GetComponent<CharacterJoint>();
12         joint.breakForce = 0;
13     }
14
15     private void OnJointBreak(float breakForce)
16     {
17         dismemberment.Dismember("Head");
18     }
19 }
20
```

The line `dismemberment.Dismember("Head");` on line 17 is highlighted with a red rectangular box, indicating the action triggered when a joint is broken.

13. That's all. When everything is configured, a dismemberment will look something like this



Tips and tricks

1. Effects can be mirrored by simply changing scale sign on negative. It allows to make effects only for one side of a character.
2. It is recommended to fragment mesh corresponding to ragdoll bodyparts, as it allows to associate dismembering with OnJointBreak event. It is also possible to join several bodyparts into one fragment (for example LowerArm fragment can include lower arm and hand colliders).