Instruction Manual for Using Mesh Modifiers with UMA

A Comprehensive Guide

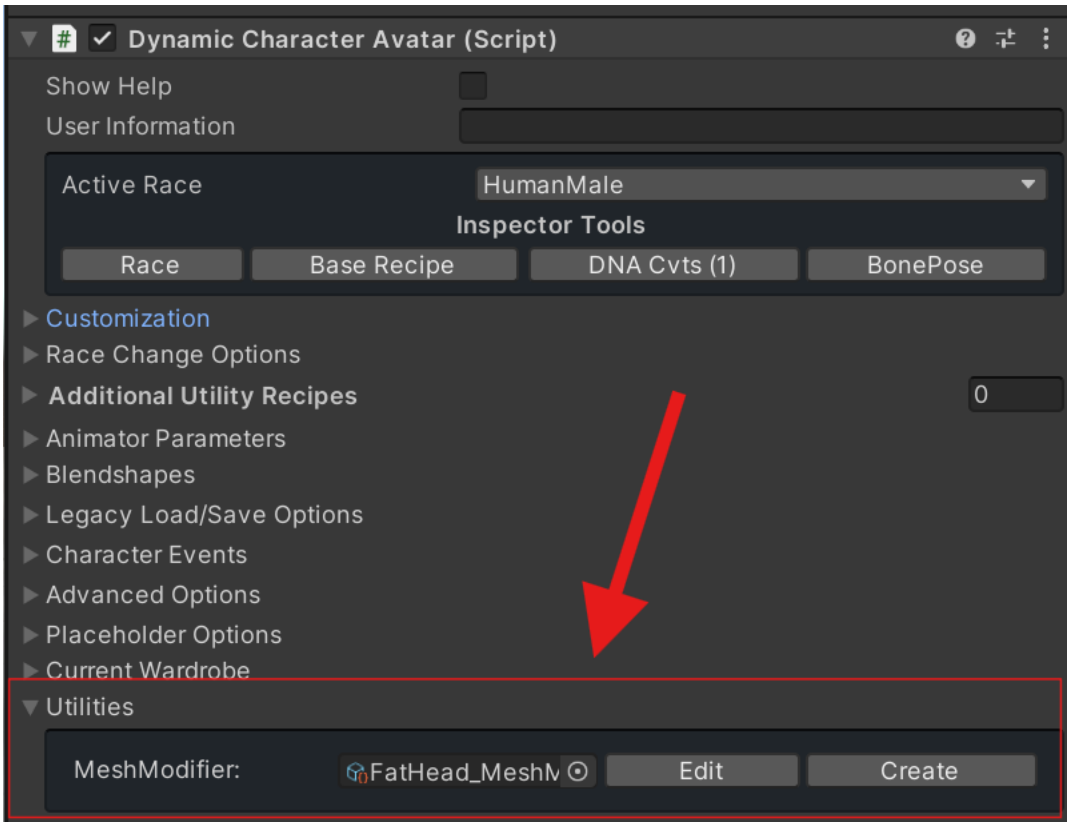
Introduction

The Unity Multipurpose Avatar (UMA) system provides a powerful framework for creating highly customizable characters in Unity. Mesh Modifiers are an advanced feature that allows you to dynamically alter the mesh of your characters, adding a new level of customization and flexibility. This manual will guide you through the creation, editing, and application of Mesh Modifiers in UMA, ensuring you can leverage this feature to its fullest potential.

Getting Started with Mesh Modifiers

Accessing Mesh Modifiers

Unlike earlier versions, Mesh Modifier creation and editing are now accessed directly from the DynamicCharacterAvatar. This change allows you to see the effects of the modifiers in real-time while editing, providing a more intuitive and efficient workflow.



Prerequisites

Before you begin, ensure you have the following prerequisites:

- Unity installed (version 2022 or later recommended)
- UMA package installed in your Unity project
- Basic understanding of Unity's interface and UMA structure

Creating and Editing Mesh Modifiers

Step-by-Step Guide

To create and edit Mesh Modifiers, follow these steps:

1. Select the DynamicCharacterAvatar: In your Unity scene, select the DynamicCharacterAvatar component attached to your character. You should have “Editor Time Generation” enabled in order to edit and see the Mesh Modifiers in the editor. Ensure that you have the slots that you want to add modifiers for on the character!
2. Navigate to the “Utilities” Section: In the inspector window, find the Utilites section. Here you can create or edit Mesh Modifiers.
3. Create a New Mesh Modifier: Click on the "Create" button. This will open the editor, and allow you to define
4. Edit an existing Mesh Modifier: In the utilities section, drop (or select) the Mesh Modifier in the field provided. Click “Edit” to edit the Mesh Modifier in the editor.
5. Preview Changes: As you edit the Mesh Modifier, you can enable “Rebuild on change” on the Mesh Modifier window to observe the changes in real-time on your character model in the game view. This allows you to fine-tune the settings and ensure the modifications are applied correctly. Without this selected, you can rebuild the character at any time.
6. If some Wearable items are getting in the way, then from the Wearables window in the scene view, you can enable/disable them or even enable/disable them at the slot level. Note: Wearable is the new nomenclature for the upcoming changes to UMA. Wearable items will go into Wardrobe Areas.

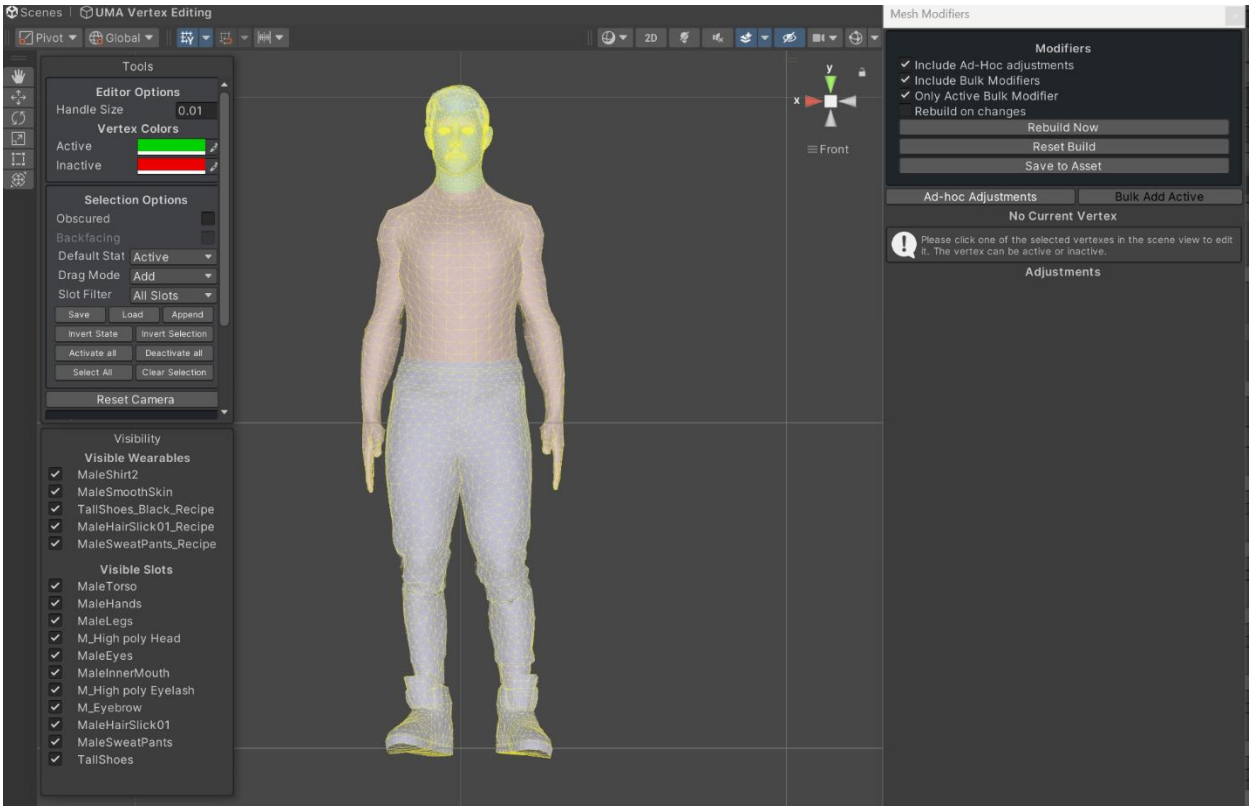
Using the Vertex Editor Tool

To start using the vertex editor, you must first select the desired vertices on your mesh. Selected vertices can either be Active or Inactive by default. To select a vertex, you can shift-click on it individually or use the box selection method to select multiple vertices at once. When dragging over vertices, you can add them to your selection, remove them from the selection, invert their selection state, or activate/deactivate the vertices.

Additionally, you can enable the selection of obscured or back facing vertices and limit your selection to a specific slot. Once you have made your selection, you can save or load the current vertex selection set, allowing for easy management of complex modifications.

Navigating through the scene follows the standard Unity format, using the alt key combined with mouse buttons. When selecting vertices individually, a shift-click will add to the selection or invert its state if it is already selected. To remove a vertex from the selection, simply control-click on it.

To reset the camera to the front of the character, use the “Reset Camera” button. Be aware that some options in the tools window might be hidden and may require scrolling to be seen. Note that only active vertices are added to bulk vertex modifiers.



Applying Mesh Modifiers in a Wardrobe Recipe

Adding Mesh Modifiers to a Wardrobe Recipe

Mesh Modifiers are typically added to a Wardrobe Recipe, which allows them to be applied dynamically based on the character's wardrobe. To add Mesh Modifiers to a Wardrobe Recipe, follow these steps:

1. Select the Wardrobe Recipe: In the UMA Wardrobe section, select the Wardrobe Recipe you wish to modify.
2. Navigate to the Modifiers Section: Locate the Modifiers section within the Wardrobe Recipe properties.
3. Add Mesh Modifiers: Click on "Add Modifier" and select the Mesh Modifiers you wish to include in the recipe. Configure the settings as needed.

Applying the Wardrobe Recipe

Once the Mesh Modifiers are added to a Wardrobe Recipe, they will be applied during the character build process if the character is wearing the recipe. This ensures that the mesh modifications are integrated seamlessly with the character's appearance.

Editing Mesh Modifiers Ad-Hoc

Real-Time Editing

One of the key advantages of Mesh Modifiers is the ability to edit them ad-hoc. This means you can make real-time adjustments to the modifiers without having to go through the entire build process.

Steps for Ad-Hoc Editing

1. Select the DynamicCharacterAvatar: In your scene, select the DynamicCharacterAvatar component of your character.
2. Navigate to the Mesh Modifiers Section: In the inspector window, locate the Mesh Modifiers section.
3. Edit the Modifier: Adhoc modifiers work on the “Current” vertex. To make a vertex current, make sure you have selected some vertexes, and then go into ad-hoc mode, and click on a vertex. It should begin flashing. Now you can add modifiers for that vertex, and edit values specifically.
4. Save Changes: Once satisfied with the modifications, save the changes to ensure they are applied during the next build process.

Editing Bulk Mesh Modifiers

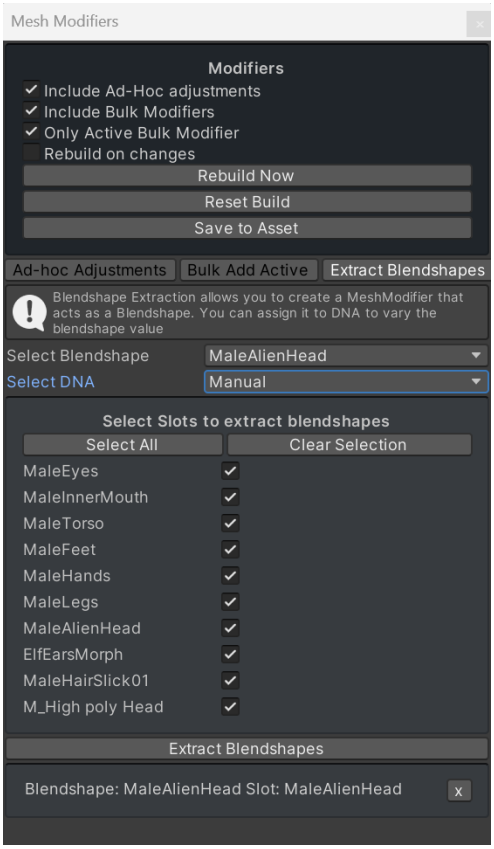
Steps for Bulk Editing

1. Build your character with the slots & wearable items that need to be present.
2. Edit or create a new modifier.
3. Select the Bulk Editing section from the top button bar on the Mesh Modifier window.
4. Select Modifier type: In the UMA Editor, select the Mesh Modifiers you wish to edit. Use the multi-select feature to choose multiple entries. When you have vertex selected and activated (green), select the Modifier type from the dropdown, and choose “Add Collection for selected vertexes”. A new collection of that type will be created, and you can edit all values at one time.
5. Edit Properties: Adjust the properties of the selected Mesh Modifiers. The changes will be applied to all selected entries.
6. Save Changes: Save your modifications to ensure they are incorporated into the character builds.

Extracting Blendshapes

Steps for Extracting Blendshapes

1. Build your character with slots & wearable items that need to be present.
2. Edit or create a new modifier.
3. Select the Extract Blendshapes section from the top button bar on the Mesh Modifier window.
4. Select the Blendshape you want to extract.
5. Select the DNA you want to use to apply the Blendshape (or leave “manual” to allow manual weight setting).
6. Select the slots you want to extract from (or press the Select All button).
7. Press the Extract Blendshapes button. Modifiers will be created for the “end frame” of the blendshape, for any slot that has that blendshape.
8. Save the changes to the asset.



Advanced Tips and Tricks

Optimizing Performance

When using Mesh Modifiers, it's important to consider performance. Here are some tips to optimize performance:

- Limit Complexity: Avoid using too many complex Mesh Modifiers on a single character to reduce processing overhead.
- Profile and Test: Regularly profile your project and test performance on various devices to ensure optimal performance.

Troubleshooting

Common Issues and Solutions

Here are some common issues you may encounter with Mesh Modifiers and their solutions:

- Modifier Not Applying: Ensure the Mesh Modifier is correctly added to the Wardrobe Recipe. Verify that the character is wearing the recipe during the build process.
- Unexpected Mesh Deformations: Double-check the settings of the Mesh Modifier. Small adjustments can sometimes lead to significant changes in the mesh. Note that all changes are to the *base mesh*, not to the transformed mesh.
- Performance Drops: Review the number and complexity of Mesh Modifiers applied. Optimize settings as needed and consider using LOD techniques.

Conclusion

Mesh Modifiers in UMA provide a powerful tool for customizing character meshes dynamically. By following this instruction manual, you can create, edit, and apply Mesh Modifiers effectively, enhancing the visual fidelity and uniqueness of your characters. Whether you are making ad-hoc changes or performing bulk edits, the flexibility and control offered by Mesh Modifiers will significantly enhance your character creation process in Unity.