Super Combiner Manual

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Lunar Cats Studio

1. Features

- Texture atlas automatically generated
- Works with all material and shader
- UVs, Normals and Tangents are automatically adjusted
- Can handle tiled textures and meshes with UV out of (0, 1) bound (source texture will be optimized and tiled in atlas texture)
- Combine all different materials into a unique material with texture atlas. All meshes and prefabs will share this material (only one draw call for rendering)
- Animations, bones and blendShapes on SkinnedMesh remain intact
- Combine all Meshes / SkinnedMeshes into a unique Mesh
- Supports removing meshes from the combined mesh at runtime
- [New feature in alpha!] Combine all SkinnedMeshes into a unique skinnedMesh
- If combined mesh exceed 64k vertices, it will be divided into multiple combined meshes (not needed anymore since Unity 2017.3)
- Save and export the ready to use combined assets (textures atlas, material, meshes, obj and prefab)
- Prefabs already exported will be automatically updated (not overridden) so you don't lose any work when recombining
- Absolute nondestructive workflow (source asset remain absolutely intact)
- Very easy to use and optimized workflow

2. Prerequisites

Be sure to only combine textures in a Unity compatible format (see documentation on texture supported format: https://docs.unity3d.com/Manual/ImportingTextures.html), otherwise it may not work properly.

Be sure to combine only models with materials that can be merged because you will combine different materials into a unique material. Some material have properties that cannot be merged together, for instance a Standard Material with rendering mode 'Opaque' cannot be merged with a Standard Material with rendering mode 'Transparent'. You will have to group all models that can be combined together and combine the groups separately.

Be sure that all materials to combine have the same texture properties. E.g: if one of your materials have diffuse and normal texture, all the materials should have only those two textures set.

3. How to use

Super Combiner is a tool designed to be used in the Editor mode. It can also be used at runtime but this is not recommended as it will increase the loading time.

1) Create an empty GameObject in the scene and attach the 'SuperCombiner' script

2) Add all prefabs to combine as child of it

3) Select combine options under 'SuperCombiner' script: session name, texture atlas size, whether to combine mesh or not and max vertices count.

4) Click on 'Combine' button

5) Wait and see the result on the scene

6) If parameters need to be adjusted, click 'Uncombine' and start again from 3)

7) If the result is correct, select your saving settings (materials, textures, prefabs, Obj) and define the destination folder (if no destination folder is set, the default location is /Assets/SuperCombiner/Combined)

8) Click 'Save'

9) All the optimized prefabs created can now be used in your scene!

If anything changes in the source assets (model, texture, material ...) just combine and save again. The new combined assets and prefabs will be automatically updated.

4. UVs out of bound correction

A mesh can have uvs out of the range (0, 1), this produces a tilling effect of the texture on the model.

This cannot be used in atlas texture because it will pick up neighboring textures. This is why Super Combiner will check for UVs out of bound on every model and will bake the tiled texture into the combined texture.

Super Combiner will calculate the smallest possible tiled texture to optimize the size.

5. Important information

- The first material found in the list to combine will be used as a reference for the combined material properties.

- Each material can have different textures (diffuse, normal, specular ...). Those texture must have the same size, otherwise the result will be inconsistent and a warning log will be generated. So be sure that all textures for a given material have the same size in import settings.

- Each different materials to combine should have the same properties and textures set (E.g. if a material have diffuse and normal texture, all other materials to combine must also have a diffuse and a normal texture). If a material is missing one texture compared to the other ones, the result will be inconsistent.

- If a diffuse texture is missing, a uniform texture will be created based on the main color.

- Beware that some materials cannot be combined together because their properties are conflicting and the combined material will only keep the property from the reference material (E.g. a material with transparent shader cannot be combined with a material with opaque shader). In this case group all objects with materials that can be combined together and combine them separately.

6. Known limitations

Losing reference of the combined result:

- Created combined resources (atlas textures, combined material, meshes) are instances that only exist in the current context. The reference of the instances will be lost and you will have to uncombine and combine again if the following occurs: enter in play mode, exit Unity Editor, loading a new scene, compiling script after modification.

If you want to keep those resources as assets for reuse, be sure to save them with the 'Save' button.

Altered visual with normal textures:

- If your models uses Normal texture, it may happens that after combining the visual is a little altered. This is because the atlas Normal texture is not yet considered as a Normal texture by Unity. You'll have to save and click "Fix now" when prompted to set the texture type to Normal. After that the visual will be correct.

Combining to skinnedMesh:

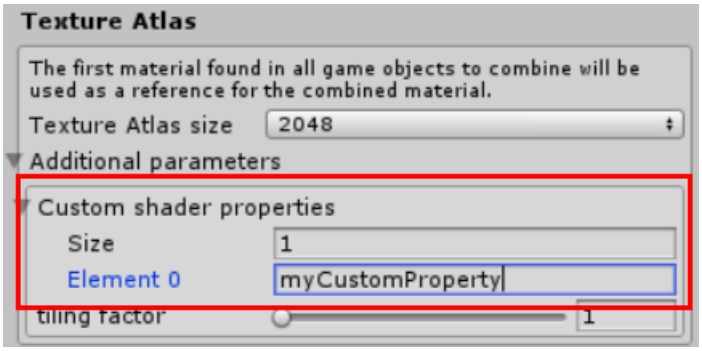
Actually this feature only allows you to combine various skinnedMeshes into a unique skinnedMesh. Combining skinnedMeshes and meshes into skinnedMesh is not yet supported and may give inconsistent results.

Support of custom shader properties:

Super Combiner supports by default the following texture properties:

`Diffuse, Normal, Specular, Height, Occlusion, Emission, Detail Mask, Detail Diffuse, Detail Normal, Metallic, Light Map.`

If you are using custom shader properties, you have to fill them in the "custom shader properties" field in the inspector under "Additional parameters".

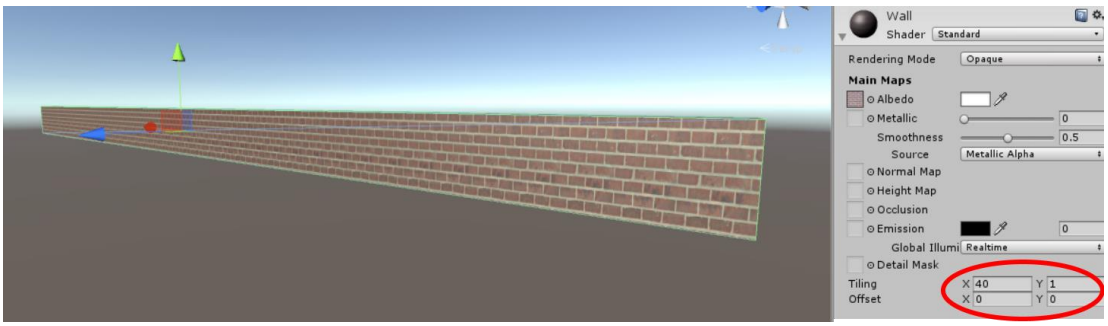


7. Resolving errors

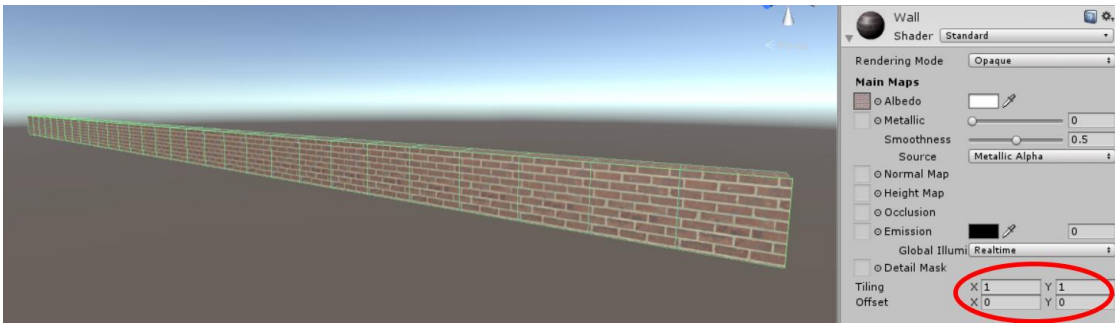
If during the process of combining you got the following errors, here is how to fix them:

`"The texture XXX is being tiled and the total tiled size exceeds the maximum texture size for the current plateform(…) This could leads to a quality loss. Whenever possible, avoid combining tiled texture."`

This is usually a consequence of an object having a too big scale factor in one of its materials. This happens if you have a big ground or wall with a texture being tiled like in the example bellow (tiling is set in material):

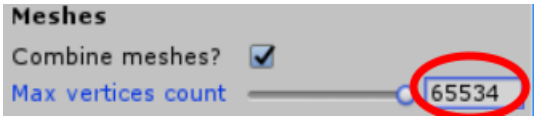


This is typically not an object to combine with SuperCombiner because the whole tiled texture of the object needs to be put in the altas (e.g original texture's size * scale factor). Instead you have to split that object into smaller pieces and keep a scale factor low.



"SetPerIndexUVs failed because the output has >64K vertices"

This happens if you try to combine a very large scene where the sum of all vertices of all 3d objects is higher than 64k which is the maximum that Unity can handle. To fix this issue, you have to reduce the "Max vertices count" parameter. Therefore Super Combiner will split the combined mesh into several meshes of "Max vertices count" vertices.



I have a lost in texture quality after combine

This could mean that the texture atlas size is too small given all the textures you want to combine. Try to increase the texture atlas size (maximum size is 8192*8192). Beware that the atlas size cannot be higher than the maximum texture size handled by Unity for the current plateform.

This could also means that you are trying to combine tiled texture and the combined tiling exceeds the maximum possible size. To fit in the atlas, the texture is being shrunk leading to a quality loss.

"[Super Combiner] Material 'XX' has various textures with different size! Textures in this material will be scaled to match the smallest one. To avoid this, ensure to have all textures in a material of the same size. Try adjusting 'Max Size' in import settings."

This error means that the material XX has textures with different size. When combining materials and creating atlas, it is mandatory that all textures in a given material have the same size because UV in for each atlas will refers to the same rectangle. To avoid inconsistent results, Super Combiner will scale down the textures size to the smallest one. If this is not what you want, you can edit your textures or just change their size in the import settings so that the size match.

8. Public APIs

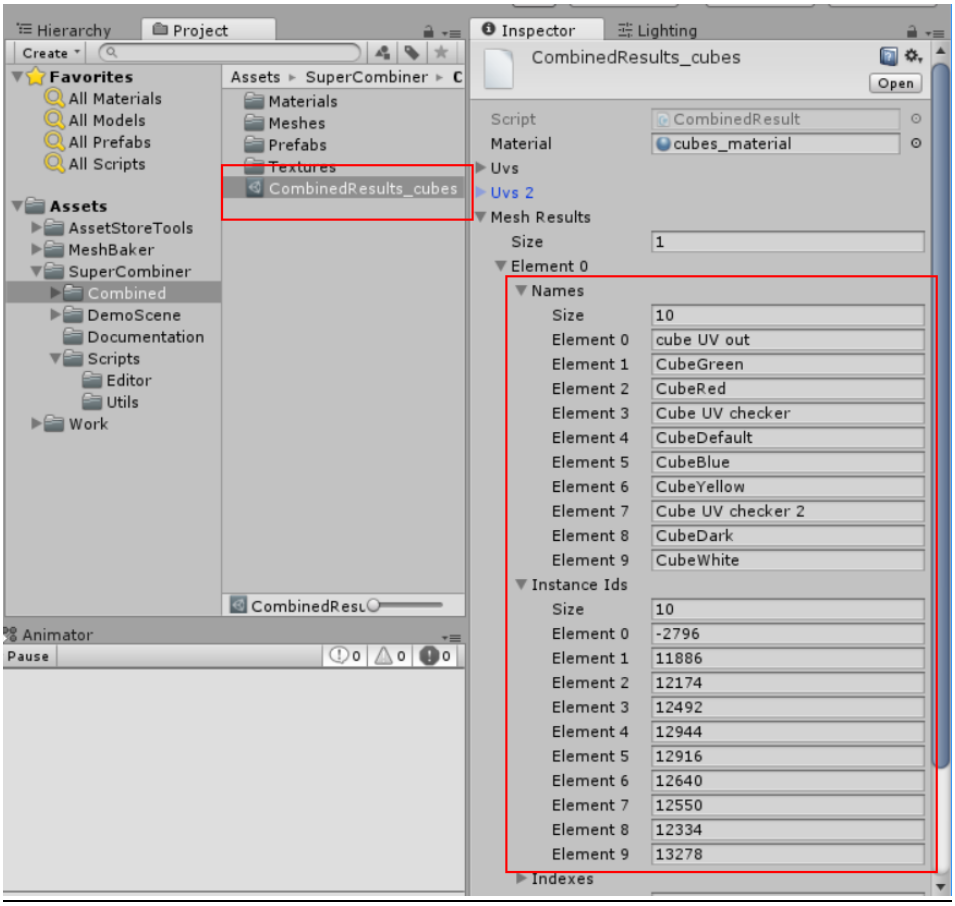
Combine a specific list of GameObjects:

You can combine at any time a custom list of GameObjects by calling the "**Combine**()" API from SuperCombiner script, and giving the following parameters:

- **meshesToCombine**: List of MeshRenderers
- **skinnedMeshesToCombine**: List of SkinnedMeshRenderers

Removing a Mesh from the combined mesh at runtime:

Super Combiner script keeps tracks of each individual meshes in the combined mesh by their instance IDs so that is it possible to remove them at runtime. You will found those values in the "**CombinedResults_YourSessionName.asset**" file in the destination folder.



Under the "**Names**" parameter you will find the list of names of the original GameObjects combined. Under "**Instance Ids**" you will find their instance IDs.

In order to remove one element from the combined mesh you have to attach the "**CombinedMeshModification**" script to the combined GameObject in the scene and set the two parameters:

- **CombinedResult**: The reference to the combinedResult file where are stored the mesh information

- **MeshFilter:** The reference to the mesh filter of the combined GameObject in the scene

Then at any time you can call the "**RemoveFromCombined()"** API from CombinedMeshModification script passing it the instance ID of the mesh you want to remove.

9. Contact And Support

If you are facing any issue, please contact me, I will provide support.

As this Asset is in constant evolution, you can also contact me for any suggestion or for new feature you wish to see in this assert.

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