Asset *JUGGLER*

Combination Generator for Cinema 4D

Manual

Contents

Introduction

Welcome to Asset Juggler for Cinema 4D.

At first, we would like to thank you very much for the purchase of Asset Juggler. We appreciate the trust you put in our product, and we will do our best to really deserve this trust.

Asset Juggler will assist you with the creation of series of unique combinations of assets. Be it in game development, in order to quickly show different options and variations of a project to a customer or for NFT series, which became so popular in the recent past.

We put quite a bit of effort into the design of Asset Juggler and its workflow, to provide as much flexibility as possible, while at the same time keeping the time to final result as short as possible. Most important, Asset Juggler is supposed to be fun to use.

Regardless of your setup, Asset Juggler will make sure, the created versions are indeed unique, and you receive as much information about the resulting series as possible.

If you run into issues with Asset Juggler, which we do not hope, please do not hesitate to contact us (either via mail info@3dtoall.com or our website https://www.3dtoall.com/contact/). We will always try to fix any bugs as quickly as possible. Feature requests (e.g., maybe additional report formats) are welcome as well. Unless no major architectural changes get implemented (which we would indicate via an increased in major version), updates will be free and are covered by your current license. Assuming you already bought a license, that is. If not, then feel free to enjoy the demo mode and hopefully you will consider the purchase of a license later.

Thanks!

We are especially grateful to Tural/2ragon for providing ideas and beta testing.

Features

- 5 types of Asset Groups
- Support for animated assets
- Up to 1000 Asset Groups per project
- Up to 1000 Assets per Asset Group
- 6 different types of Rules
- Up to 1000 Rules per project
- 5 different modes to Bake the final series
- Live-Preview
- Statistics and bar chart
- Different report formats, for example one prepared for Openseas
- and more...

Requirements

- Cinema 4D R23+ on Windows or Mac
  NOTE: Asset Juggler has been designed for Cinema 4D R25+, but has been tested to work down to R23. Due to Maxon's UI changes in R25, icons will look a bit strange and will not match this documentation in versions below.
- One Asset Juggler license per machine. Without valid license Asset Juggler will work in demo mode and allow very limited baking, only.

Installation

1) Unzip the downloaded Asset Juggler archive into Cinema 4D's plugins folder.
2) (Re-)start Cinema 4D.
3) Asset Juggler can now be found in Cinema 4D's Extensions menu.

Nowadays Cinema 4D supports multiple places/folders to install plugins into. The easiest way to find the default location is to open Cinema 4D, open Preferences and press "Open Preferences Folder..." in the bottom left corner of the Preferences dialog. Within there you should see the "plugins" folder.

Demo Mode

After installation Asset Juggler will be in *Demo Mode*. With the sole exception of baking the generated series, all features work and can be explored in depth. In *Demo Mode* baking of series is restricted to five combinations maximum and upon pressing the *Bake* button, Asset Juggler will ask to activate the plugin with a valid license.

Differences in *Demo Mode*:

- Baking restricted to a maximum of five combinations
- *Bake* button opens Activation dialog, Asset Juggler will still bake up to five combinations if the dialog gets canceled.
- Additional "Activate Asset Juggler" button at the top of the main dialog
- About dialog has an additional "Activate..." button

Licensing

A valid license is needed to use Asset Juggler (instead of just playing around in *Demo Mode*). An Asset Juggler license is locked to a single computer and cannot be transferred to another machine (nor would it be allowed). If for some reason, you need to move the license to another machine, please contact us (info@3dtoall.com or https://www.3dtoall.com/contact/).
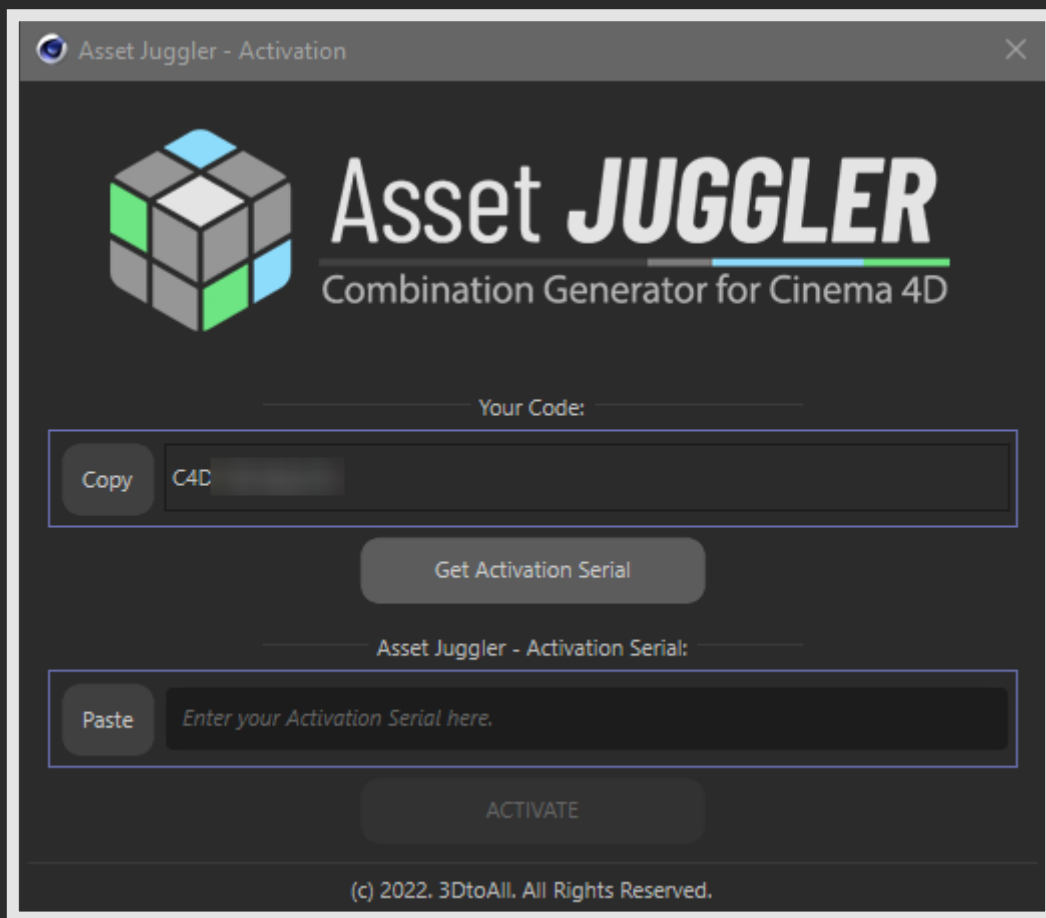
1) Copy your personal activation code to the clipboard (e.g., by pressing "Copy").
2) Clicking "Get Activation Serial" takes you to 3DtoAll's activation page.
3) Paste your personal activation code there.
4) **Important:** Use the **same** e-mail address, which was used to purchase Asset Juggler.
5) You'll receive your personal Activation Serial via e-mail.
6) Paste your personal Activation Serial into the respective field in the Activation dialog and press "ACTIVATE".

NOTE: Between steps 4 and 5 the Activation dialog may be closed. It can be opened later again, after you have received your personal activation serial.

General Workflow

Asset Juggler works best, if used after a collection of assets has been assembled.

To create a series of unique combinations of such prepared assets, you will more or less quickly go through the following steps:

1) Create one or multiple Asset Groups.
   One or two clicks per group, a matter of seconds.
   See chapters Asset Groups and Settings: Asset Groups.
2) Assign assets to these Asset Groups.
   Few seconds, depends on how fast you can drag stuff from the Object Manager.
3) Optionally create one or more Rules to further influence the generation of the series.
   Just a few clicks per Rule, again a matter of seconds.
   See chapter Settings: Rules.
4) Tweak probabilities and Rules assisted by Live-Preview.
   Well, this one is on you. If you are more the perfectionist type, do not blame us, if you get stuck here forever...
   See chapter Asset Group Configuration.
5) Generate the final series.
   A single button click, usually just a matter of a second or two for series of 10000 combinations.
   See chapter Generation.
6) Check statistics of the generated series to make sure, it looks as expected.
   See chapter Statistics and Reports.
7) Bake the generated series into one or multiple Cinema 4D project(s).
   Depending on the mode used for baking, this can indeed take a while. If you chose a slow mode, just get yourself a coffee and enjoy the feeling, that Cinema 4D and Asset Juggler are working for you, doing all the stuff you did manually before purchasing Asset Juggler.
   See chapter Baking.

In summary, excluding the time for tweaking (which is on you) and baking (which is on your computer), the entire setup of a series is a matter of seconds or very few minutes.

Asset Groups

Asset Groups are different, well..., groups of assets (or components, traits, different objects belonging to a kind of flavor or family, ...). The main difference between the five types of Asset Groups is the source, where the assets are coming from.

Up to 1000 Asset Groups can be created per project and each Asset Group can refer to up to 1000 assets.

We recommend assembling all assets before starting a series in Asset Juggler and assigning them to Asset Groups.

Asset Juggler will always refer to assets via their respective index within (or relative to) their "asset source". Keep this in mind, when changing the actual assets of already assigned Asset Groups! Also see Note on Updating Asset Groups in chapter Settings: Asset Groups.

For details on setup and configuration of Asset Groups see chapter Settings: Asset Groups.

Asset Group "Object" (⬤)

Defined by an arbitrary parent object.
All first level child objects of the parent will be regarded as separate assets.
Objects get indexed in their order in Object Manager (top to bottom).

Asset Group "Material" (◎)

Defined by a base object and a layer.
All materials assigned to the layer are considered assets and will be assigned to the linked base object. In other words: A Material Group always leads to the same object, only with different materials.
Materials get indexed in their order in Material Manager (left to right, top to bottom).

Asset Group "Project" (🖹)

Defined by selecting an arbitrary Cinema 4D project file (or an Alembic or FBX file for that matter) from disc. All root level objects inside this project will be regarded as separate assets. Objects get indexed in their order in Object Manager (top to bottom).

Asset Group "Folder" (🗀)

Defined by selecting an arbitrary folder on disc. All scene files (C4D, ABC or FBX) found in this folder will be regarded as separate assets.
Projects get indexed in alphabetical order of their filenames inside the folder.

Asset Group "Material Override" (☉)

Defined by an Asset Group and a layer.
All materials assigned to the layer are considered assets and will be assigned to the object chosen by the connected Asset Group in any given combination.
In other words: This Asset Group does not create or add any object, but it changes the texture of another Asset Group.
Only preceding Asset Groups can be selected. Therefore, we recommend adding any Material Override Groups last.
Material or Material Override Groups can not be selected for obvious reasons.
Materials get indexed in their order in Material Manager (left to right, top to bottom).

NOTE: It is not recommended to use the same asset(s) in multiple Asset Groups!

Simplified (ignoring different Baking Modes) Material Groups and Material Override Groups can be imagined as adding a Texture tag to an asset's parent object. This means Cinema 4D's texture inheritance rules fully apply. Therefore, these Asset Groups can not only be used to completely texture assets. In fact, they really texture untextured parts of assets, only. Imagine an asset consisting of a hierarchy of objects, with only parts of the hierarchy pre-textured.

NOTE: This also means, these Asset Groups have a potential to cause visually duplicate combinations, if the asset is already fully textured. Despite Asset Juggler choosing two different materials, such an asset will look visually identical!

Generation

While generating a series of combinations, Asset Juggler basically throws dice. Afterall it is supposed to create random combinations of assets. But this also means, there may be situations, where Asset Juggler is not able to find enough unique combinations. In this case the Statistics button will be colored red, green otherwise.

Influences on Asset Juggler's ability to find combinations:

- Very low chances
- Rules

Asset Juggler estimates a maximum number of combinations, which in best case may be possible to generate from the given assets. This number is shown directly below the Count slider on Main tab. Best case means, equal chances and only certain rules. Assets with zero chance or rules which force pairs or equal index get considered, but as rule setups can get arbitrarily complex (rules depending upon another, …), that's really all. It should be considered an optimistic guess of an upper bound, only.

Asset Juggler really works best, if provided with enough assets to easily reach the desired number of combinations. It will do a terrible job, if you want to generate all possible combinations from a given set of assets. Such mode could be implemented, if requested by enough users.

This is also the reason, why the Count slider's maximum is capped at half of the calculated maximum of combinations. One can override the maximum via the edit field left of the slider, though.

Baking

Baking will turn a formerly generated series (basically a list of asset indices) into an actual project file (or multiple thereof).

NOTE regarding lack of progress information during baking:
Unfortunately, Asset Juggler can not show any progress information (believe us, we tried hard). Cinema 4D will appear locked during baking. Baking is finished, when Picture Viewer shows the resulting bar chart and the target folder gets opened in Explorer/Finder.

When baking a generated series, Asset Juggler executes the following steps:

1) A target folder is created within the current project's folder. Its name consists of the name of the series plus a date/time code. Asset Juggler writes only into this folder.
2) Assets from Project Groups get imported under a separate Null object.
   NOTE: Texture paths get converted into absolute paths (actually any path to external assets).
3) Depending on baking option "Xref" assets from Folder Groups get either imported under separate Null objects or one Xref object per asset gets created.
4) Active camera and render settings get cloned into the resulting project(s).
   NOTE: Active camera gets cloned including all its parent objects (if any). This is done in case the camera is animated by any such parents.
5) Visibility of original assets gets initialized as needed (usually: Parent object gets hidden; assets get default visibility).
6) Depending on Baking Mode:
   a) Keyframes / Visibility
   1. No further referencing takes place, instead Asset Juggler directly creates keyframes switching the visibility of assets on and off (plus turning invisible generators off).
   2. Maximum project time gets set to the number of baked combinations.
   3. The result is a project file with one combination per keyframe.
   b) Keyframes / Instances
   1. Asset Juggler creates one Instance object per Asset group. It is the Reference Object parameter of these Instance objects, which get keyframed in this mode.
   2. Maximum project time gets set to the number of baked combinations.
   3. The result is a project file with one combination per keyframe.

c) Takes / Visibility

1. Like mode "Keyframes / Visibility", but instead of keyframes, a Take is created per combination.
2. The output filename in render settings (Save tab) is set to use the Take name.
3. The result is a project file with one Take per combination.

d) Takes / Instances

1. Like mode "Keyframes / Instances", but instead of keyframes, a Take is created per combination.
2. The output filename in render settings (Save tab) is set to use the Take name.
3. The result is a project file with one Take per combination.

e) Project Files

a. No keyframes or Takes get created in this mode. Instead, only the assets visible in a combination get extracted into a separate project.
b. The output filename in render settings (Save tab) of each project file is set to the series name plus a four-digit index of the combination ("My Series_0000", "My Series_0001", …).

7) Finally, statistics and reports will be generated and written into the target folder.
8) By opening the target folder in Explorer/Finder and presenting a bar chart of the baked series in Picture Viewer, Asset Juggler signals baking is finished. For all modes but "Project Files" the resulting project file will also be opened in C4D in background.

*NOTE:* The two Keyframes Baking Modes are not suitable for animated assets.

Baking Modes Overview

Baking Mode	Speed	Animated Assets	Hair	Result
Keyframes/Instances	Fastest	✖	**	1 Project File
Keyframes/Visibility	Fast	✖	✔	1 Project File
Takes/Instances	Slow	✔	**	1 Project File
Takes/Visibility	Slow	✔	✔	1 Project File
Project Files	Depends*	✔	✔	n Project Files

* Highly depends on size and complexity of involved assets

** Do not enable Render Instances in Baking Options, otherwise Hair won't show up

Menu Row Buttons
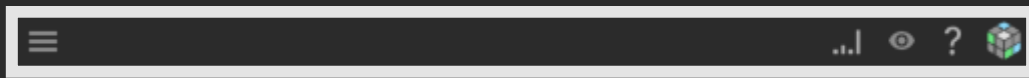
Statistics (..l / ..l / ..l): Opens the *Statistics and Reports* window.
Grey: No series generated, yet. Statistics get shown for Live-Preview.
Green: Generation succeeded to create the requested number of combinations.
Red: Generation failed to create the requested number of combinations.
[Shift+Click]: Renders a bar chart of the statistics. See chapter Statistics and Reports.

Preview Enable (👁)
Toggle Live-Preview on and off. See Settings: Preview.

Help (?)
Opens the documentation you are currently reading.

**About** (🧊)
Opens the About dialog.
Hint: The included example projects are easily accessible from here.

Using the Hamburger icon in top left corner the Asset Juggler dialog can be docked like all other dialogs in Cinema 4D. To have Asset Juggler behave like e.g., the new foldable Asset Browser or Material Manager dialogs in Cinema 4D R25, do the following:

1) Use "Customize Palettes..." to add the Asset Juggler command to an arbitrary palette.
2) Open the Asset Juggler dialog and dock it in its desired position and size.
3) Click the Asset Juggler button created in step 1) to fold Asset Juggler.
4) Save the layout as needed.

Settings: Main
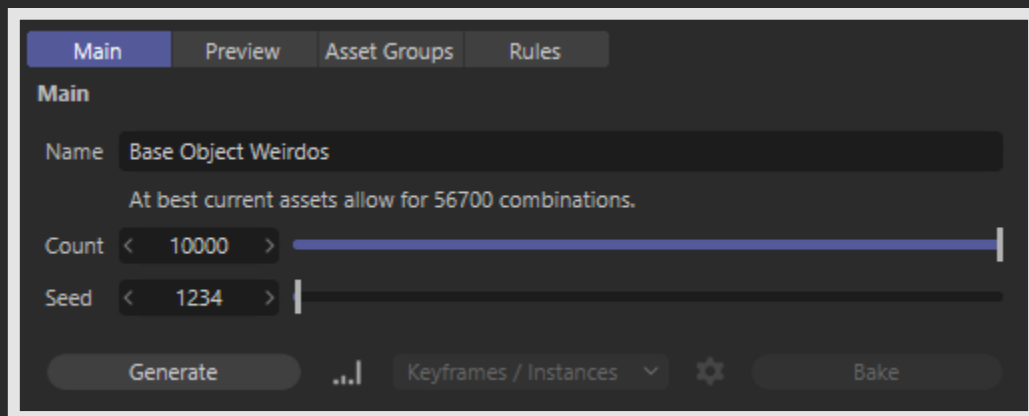
Name

Name of the series. This name will be used for target folder and resulting project file(s). It is preset with the project name.

Count - Default: 1

Number of combinations to create in a series.

Seed - Default: 1234

Start seed for the random generator used to create the series.

Generate

Start the generation of the entire series of combinations. When done, the Statistic button will light up in green or red to reflect the result of the generation.

Statistic (...I / ...I / ...I)

Identical to same button in Menu Row Buttons.

Baking Mode - Default: Keyframes/Instances

Select mode for baking, see chapter *Baking* for details.

Advanced Baking Options (⚙)

Xrefs (default: enabled): If enabled, Xrefs will be created during baking to reference assets from Folder Groups, otherwise the assets will be merged into the resulting project.

Render Instances (default: disabled): Enable to use Render Instances instead normal Instances. Render Instances are faster, normal Instances more compatible (e.g., with Hair). This option applies only to "Instances" Baking Modes (also see Baking Modes Overview).

Bake

Only available after a series has been generated. Click to start baking the series into a project (or multiple thereof), see chapter *Baking* for details.

Settings: Preview
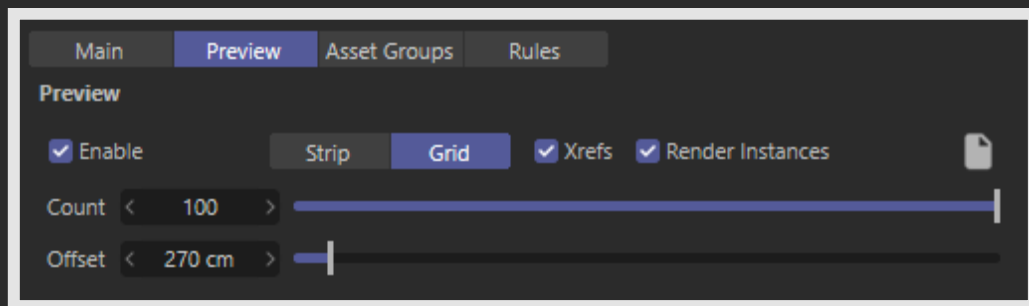
Enable - Default: Enabled
Check to enable Live-Preview (same as button in menu row).

Strip / Grid - Default: Grid
Live-Preview gets shown either as a strip of combinations offset in Z direction or as a grid with combinations offset in X/Y direction. Regardless of mode the Live Preview is offset by one offset unit in Z direction, in order to somewhat hover in the background of the original assets.

Xrefs - Default: Disabled
This checkbox is different to the Xrefs option on Main tab. Depending on this checkbox, Live-Preview either uses Xrefs to show the assets of Folder Groups (which can slow down Live-Preview considerably) or only shows the filename of the chosen asset.

Render Instances - Default: Enabled
By default Asset Juggler uses Render Instances for the Live-Preview. By disabling the Render Instances checkbox, Asset Juggler will use normal Instances instead. Render Instances are faster, normal Instances are more compatible with certain Cinema 4D features, like for example Hair or certain Redshift tags.
If assets make use of Hair, we recommend disabling Render Instances. Otherwise, hair will not show up in the Live-Preview. Depending on intended Baking Mode, you may also need to disable Render Instances in the Advanced Baking Options (see Settings: Main).

Copy Preview into separate project (📄)
The currently shown Live-Preview will be copied into a separate scene file.

Count - Default: 1
Number of combinations to show in Live-Preview.

Offset - Default: 100cm
Distance between two versions.

NOTE regarding Live-Preview:
The Live-Preview is an actual part of the current project. For example, it will be saved with the project. While this is no problem for Asset Juggler, you may want to avoid this, by either temporarily disabling the Live-Preview or by closing or folding the Asset Juggler dialog.

NOTE regarding Undo Stack and use of Xrefs:
If a Folder Group is involved and Xrefs are enabled, certain operations will change the Undo Stack of the current project. Basically, every operation, which forces Asset Juggler to rebuild the assets of the Folder Group
Unfortunately, there's currently no way around this. Sorry!
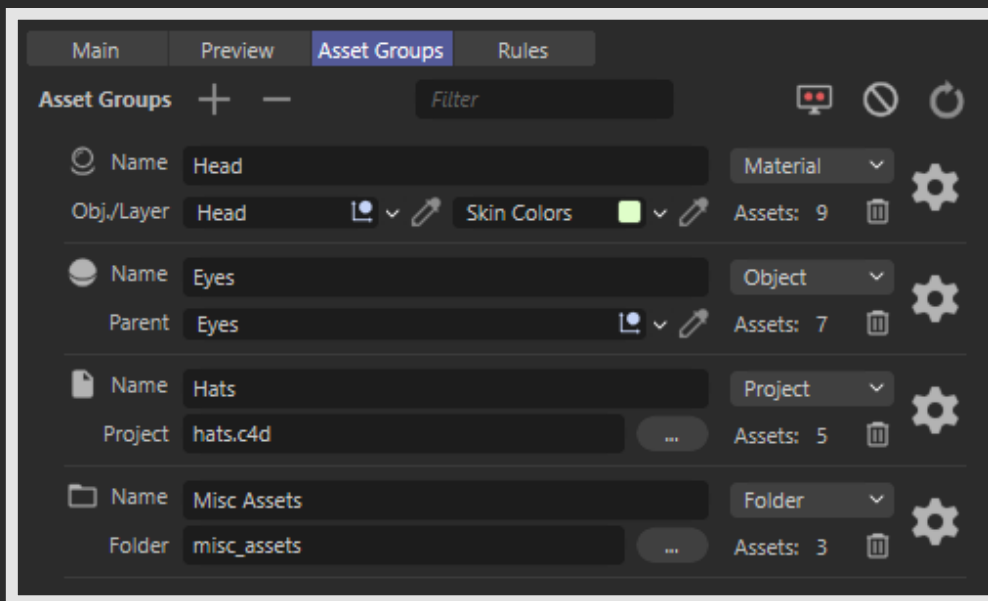
NOTE regarding Render Instances:
Here is a list of features, for which one does want to disable use of Render Instances. List will be extended as soon as we get informed about other problematic features:

- Cinema 4D Hair
- Redshift Object tags

Settings: Asset Groups

Add Asset Group (+)
Creates a new Asset Group.

Delete Last Asset Group (—)
Deletes the last Asset Group.

Filter
Only Assets Groups containing the text entered here show up in the table below.

Hide Source Assets (▦)
Hides the source assets.
[Shift+Click]: Sets the visibility to default for all Asset Groups.

Lock Zero to None for All Asset Groups (⊘)

Update All Asset Groups (↻)
Check all Asset Groups for changed (new, deleted, renamed, reordered) assets and update the groups accordingly. All locked chances will be unlocked during this process!
It is also possible to just update a single Asset Group. See chapter Asset Group Configuration.

NOTE regarding asset changes in already configured Asset Groups:
No effort is taken to associate formerly set chances with the updated assets.
This is especially apparent, when deleting or reordering assets.
Appending new assets at the end or renaming assets is no problem. To preserve already configured chances, newly found assets will get zero percent chance initially.
Deleting the last asset is also fine, all remaining chances will be rebased (sum of chances is always 100%).
All other changes will lead to wrongly associated chances and/or rule references and will need attention and care. At least, we recommend checking the configuration of such Asset Groups.

NOTE regarding use of an asset in multiple Asset Groups:
Referencing one asset in multiple Asset Groups is usually a bad idea! Even though Asset Juggler does not forbid this. Without further care one will end up with multiple identical (more or less) and overlapping assets in the same location.
The only Baking Modes this can work at all are Project Files and the Instance modes, regardless of Keyframes or Takes. The modes changing visibility only, obviously can not duplicate a source asset. Yet, we discourage such setups, as the result will most likely not be the intended one (for reasons mentioned above).

Asset Group

Asset Group Icon (● / ◎ / ▤ / ▭ / ◉)
Click to go to the respective assets, actual action depends on type of the Asset Group.
Objects are made visible and selected, projects opened in Cinema 4D and folders shown in Explorer/Finder.
[Shift+Click]: Only for Groups with parent or base object, visibility will be reset.

Name
If it is left empty, the name will be automatically preset when first assets get assigned to the group. The name is used in reports and can be changed arbitrarily as needed.

Asset Group Type - Default: Object
See chapter *Asset Groups*.

Asset Source
Options depend on Asset Group type.
Object Group: Link field to drop the parent object of an Asset Group.
Material Group: Two link fields, one for the base object and one for a layer with materials.
Material Override Group: An Asset Group and a link field for a layer with materials.
Project Group: Path to a Cinema 4D, Alembic or FBX project file.
Folder Group: Path to a folder containing project files (C4D, ABC or FBX).

Delete Asset Group (🗑)
Deletes this Asset Group.

Configuration (⚙)
Opens the Asset Group Configuration.

> Material and Material Override Groups:
> The Material Layer link field has a hidden function!
> While its main purpose is of course to receive a layer, so Asset Juggler knows the Materials to juggle, one can also drop a Texture tag here. The Texture tag will then be used as source to set all Texture Tag Settings (see Asset Group Configuration).

Asset Group Configuration
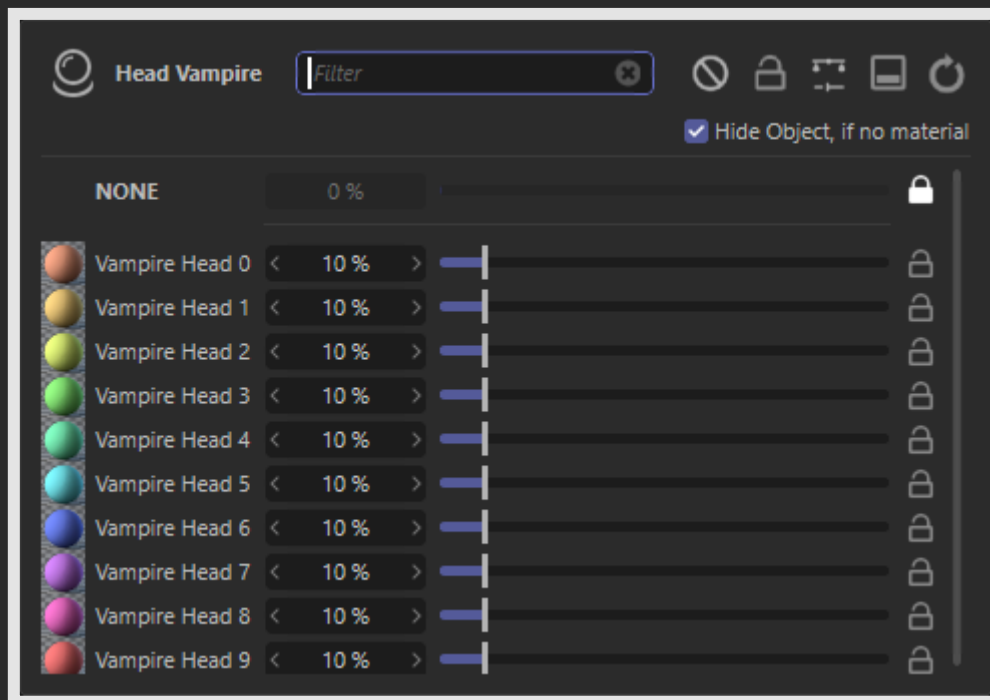
Asset Group Icon (● / ◎ / ▐ / ▭ / ◉)
Click to go to the respective assets, same as Asset Group Icon in main dialog (see Asset Group).

Filter
Only assets containing the entered text show up in the list of chance sliders below.

Lock None at Zero Chance (⊘)
Chance for having none of the assigned assets gets locked at zero percent.

Unlock All Chances (🔓)
All chance sliders get unlocked.
[Shift+Click]: Toggle all locks.
[Ctrl+Click]: Toggle all locks, except the first one (chance for no asset).

Equalize All Unlocked Chances (⟷)
All chances, which are not locked, get set an equal chance.
[Shift+Click]: Randomize all unlocked chances instead.

Show Advanced Settings (▭) - Default: Off
Toggles display of Advanced Settings.

Update Asset Group (↻)
Updates the Asset Group to reflect potential changes to its assets. All notes mentioned in chapter Settings: Asset Groups on updating all groups apply here as well.

Hide object, if no material

Only for Material and Material Override Groups: In combinations, where no material got chosen, the object will be hidden.

Asset Icons (Icon depends on asset type)

Click to go to the respective asset. Not available for Project Groups.
[Shift+Click]: Only for Object Groups: Set object default visibility.

Chance Sliders

Defines the chance of an asset appearing in a series.

Locks (🔓 / 🔒) - Default: Unlocked

Locks the value of a chance slider. Very helpful, if one wants to set multiple assets to precisely defined chances (set first chance, lock it, set second chance, lock it, ...). Or simply to protect values once dialed in.
Locking chances has no effect on Generation or Baking. Locks' sole purpose is to provide more control, when dialing in values.

Default Texture Tag (↻)

Resets all Texture Tag parameters except Selection to default.
[Shift+Click]: Reset really all, including Selection.

Texture Tag Settings

Only for Material and Material Override Groups: These settings are the same as their counterparts in Cinema 4D's Texture tag. To assign materials creates new Texture tags. If for example assets need a particular texture projection, maybe UVW Mapping, then this is the place to set such.
NOTE: One can also copy the parameters of an existing Texture Tag. Drag and drop any Texture Tag onto the Material Layer link field of an Asset Group in main dialog (see Asset Group).

Cinema 4D's Selection tags in combination with multiple Material Override groups allow to re-texture several parts of assets differently.
For this to work, all assets need to have identically named selections and the respective parts of the assets must not be pre-textured. Then simply set up multiple Material Override groups, overriding the materials of the same Asset Group and enter the different names of the selection tags in configuration of these Material Override groups.
Be careful, though! If names of Selection tags are wrong or one or a Selection tag is missing on one or more assets in a group, this can lead to duplicates in a series.

Advanced Settings
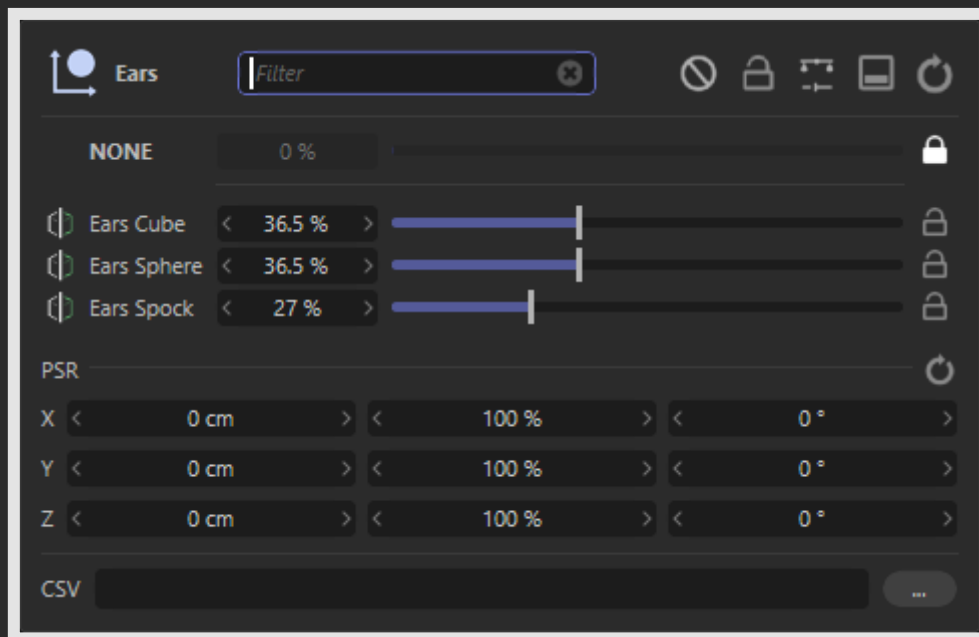
PSR

Assume a ready-made collection of Asset Groups and asset types and while creating the series, one realizes one Asset Group is erroneously offset. Now, one could go into all assets of concern and fix them manually. Or one simply unfolds Assets Juggler's advanced Asset Group settings and tweaks position, scale and rotation as needed directly for the entire Asset Group at once. For Material Override Groups this option is not available. Use PSR controls in connected Asset Group instead.

NOTE: Especially with animated assets, one may need to take special care when creating the assets for this to work. Usually, it is enough to parent assets under an additional Null object.

Reset PSR (⟳)

Reset position, scale and rotation to default values.

CSV

Here one can specify a CSV file containing comma separated asset indices (Index 0 is "none", 1 the first asset, …). These indices will be used instead of probabilities (chance sliders get disabled) to define which asset gets shown in which combination. If more combinations are requested, than the CSV file contains indices, Asset Juggler will wrap around, so the CSV sequence gets repeated.

Settings: Rules
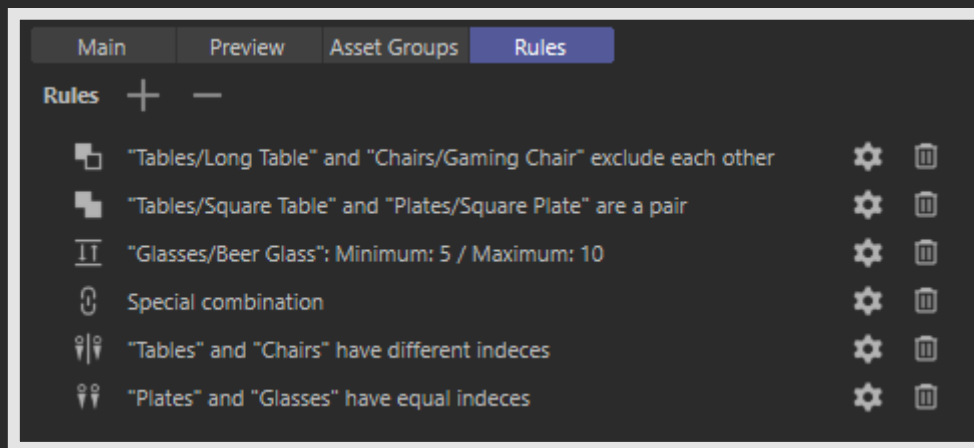
Add Rule (+)
Create a new Rule.

Delete Last Rule (—)
Deletes the last Rule.

NOTE: Up to 1000 Rules can be created per project.
Yet, please keep in mind, that rules reduce the number of combinations, that can be generated from a given set of assets. See also chapter Generation.

NOTE 2: Rules may depend upon one another.

Rule

Configuration (⚙)
Opens the Rule Configuration.

Delete Rule (🗑)
Deletes this Rule.

Rule Types

Special Combination (⟳)
Define a special combination of assets to appear in a series.

Min/Max (⊓)
The asset will appear at least in "minimum" number of combinations, but not more than "maximum".

Force Pair (▮)
Two assets will always appear as a pair. Obviously works only if assets from different Asset Groups are chosen.
Option One Way:
Asset 1 forces Asset 2 to appear, but Asset 2 may still appear without enforcing Asset 1.

Exclusion (▯)
Two assets exclude each other. So, if one of the chosen assets appears in a combination, it is guaranteed the other will not. Obviously works only if assets from different Asset Groups are chosen.

Equal Index (⸙)
Two Asset Groups will always show assets with the same index. If the third asset from Asset Group 1 is chosen, then Asset Group 2 will also show its third asset. Works best, if both Asset Groups have an equal number of assets. If an index is chosen, which is not available in the other Asset Group, then no asset will be shown for the second group.

Different Index (⸙)
Two Asset groups will never show assets with an identical index. If the second asset is chosen from Asset Group 1, it will be guaranteed Asset Group 2 will not show its second asset.

Rule Configuration

Configuration of Rules is so simple, we didn't even bother to take a screenshot. Simply choose a Rule Type together with Asset Group(s) and (depending on Rule Type) specific assets. Done. For certain Rule Types there's an Asset option "ANY". This means any asset, but NONE.
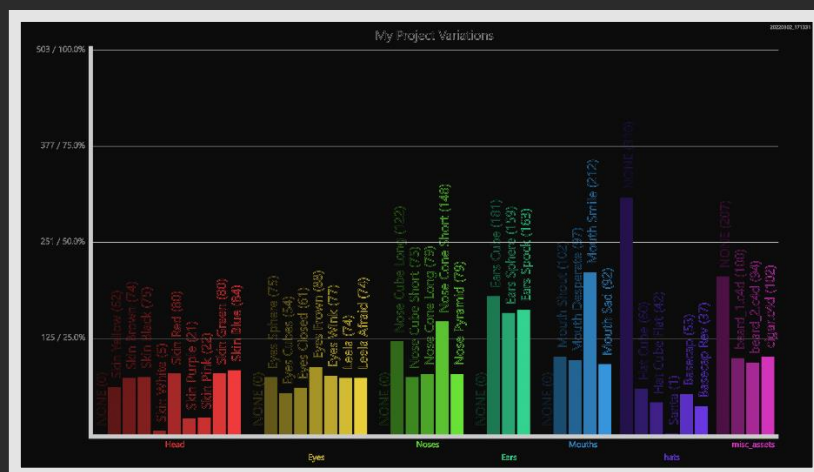
Statistics and Reports
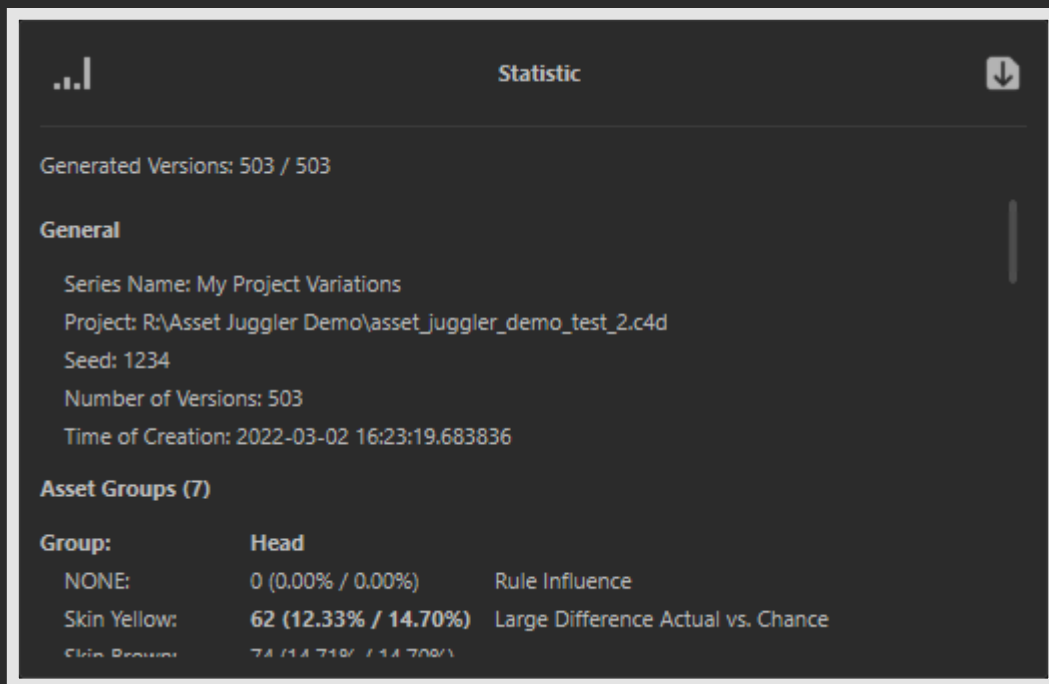
Render Statistic (..l)

Renders a bar chart of the statistics, like the following:

Write Reports (⬇)

Write all report files to a folder. Name of the folder is the series name (without date code).

These are the same report files, one would get, if the current series was baked.

If one wants to check a generated series before it gets baked, then this is the button.

Statistics

Statistics are divided in three main groups:

- General information about the series.
- Information about all Asset Groups.
- List of Rules which were applied during Generation.

Reports

While we already offer multiple report formats to suit as many needs or workflows as possible, we openly confess, your individual workflow is probably still not covered. If so, please do not hesitate to contact us (info@3dtoall.com or https://www.3dtoall.com/contact/). Such an update would be free and delivered rather sooner than later.

- Text report, filename series name_report.txt
  Basically the content of Statistics window in plain text.
- CSV, filename series name.csv
  A plain, comma separated table of all combinations of a series.
- CSV Group Indexes, filenames series name_group_group name.csv
  Multiple CSV files, one per Asset Group.
  A file per Asset Group contains a comma separated list of all asset indexes.
  See hint below.
- Custom JSON, filename series name.json
  All statistic information in simple JSON format.
- Custom XML, filename series name.xml
  All statistic information in simple XML format.
- Two JSON files prepared for Openseas,
  filenames series name_openseas.json and series name_openseas_2.json
  Highly depends on personal preference and pipeline considerations, which format suits a given workflow better.
- One JSON file prepared for Cardano, filename series name_cardano.json
- Bar chart, filename series name_barchart.png
  Provides a quick overview of asset occurrences in a series.

- Bar chart project file, filename series name_barchart.c4d
  Maybe one wants to use the bar chart in some other context and thus modify it to some specific needs, this is the project file to start with.
- HTML bar chart, filename series name_barchart.html
  As a pixel image is not always the best representation of a bar chart, here is one in HTML to open in a browser.

CSV Group Indexes files:
These files are specifically for use in an Asset Group's CSV option (see Advanced Settings).

By choosing the respective files for ALL Asset Groups of a project, one basically gets an "art directable" baked version of the project. It is possible to use these files for selected Asset Groups, only. This can make perfect sense if one knows what one is doing. But to guarantee identical combinations, it is important to set these files for all groups!

Now, what is the point in setting up a project like this?
Basically one gets the option to selectively change individual asset decisions in selected combinations, by editing the CSVs manually. Afterwards one can bake again to generate a new project file for render.

BEWARE!
Using this workflow, Asset Juggler can no longer maintain uniqueness. One is forcing all decisions onto Asset Juggler via the CSV files. If uniqueness of all combinations is of absolute importance, then one needs to be extremely careful, when editing the CSVs to not introduce duplicate combinations.

Another way of achieving similar "art directability" may be the use of the Special Combination rule.

Limitations:
After changing a CSV file, one currently needs to reload the CSV manually to see the changes reflected in the Live Preview. For baking the latest CSVs are always loaded from disc. To update the CSV for Live Preview, one needs to select the file again inside of the respective Asset Group.

Please note, we are aware, the workflow here leaves a lot to be desired. Given enough requests we will certainly consider improving this feature and workflow.

Trick: Dummy Groups

Let's assume, we have two different characters: a vampire and a zombie. Each consisting of a body and a head mesh. Further we have multiple materials per head and per body (of course different ones for zombies and vampires).
For the series, we demand the following:

- There's always exactly one character visible, either vampire or zombie.
- Vampires and zombies are supposed to be textured randomly.

Problems:

- A Material Group allows to re-texture only one single asset.
- A single asset should not be used in multiple asset groups.

How do we get around this limitation?

The answer is a "Dummy Group".
Basically this is an Asset Group, which refers only to Null object assets and itself does not have any visible influence on the end result.

Here's how to set up above series (project file with this setup is delivered with the plugin):

- Scene preparation
    1. Have all materials assigned to one of four different Layers (Head/body of vampires/zombies).
    2. Separate the heads into their own hierarchy. If the characters are animated, possibly constraining the heads to the position of a Null object in their previous position and hierarchy.
    3. Set up the "Dummy Group", have one Null object representing a vampire and one Null object representing a zombie grouped under a third Null object.
- Asset Group setup
    1. First, we need four Material groups, each gets assigned a head/body of a vampire/zombie plus the respective material layer.
    Result: Arbitrarily textured vampire bodys and heads, glitching into arbitrarily textured zombie heads and bodys in the same location. Some even without any texture!
    2. In anticipation of what's to come, we enable "Hide object, if no material" and also lock the chance of no material to 0%.
    Result: Some changes in generated combinations, as now all meshes are textured, but still far from what we want to achieve.

3. Add another Asset Group in Object mode and assign the parent of the "Dummy Group" created before. We always want to have either a vampire or a zombie, so we also lock the chance for None to 0%.
Result: Again, the chosen combinations change (there's another level of freedom, now), but we didn't seem to get closer to the desired result. Actually it seems, we are even further away, because now there's a certain chance, we end up with pairs of identically looking combinations in a series! The "Dummy Group's" choice makes a combination unique, but it doesn't add visual difference...

- Rules setup
  With four quick to setup Rules, we will now fix the setup and achieve exactly what we wanted.
  1. Add two Force Pair Rules:
      a. Force Pair "Dummy Group / Vampire" and "Zombie Body / None"
      b. Force Pair "Dummy Group / Zombie" and "Vampire Body / None"
  2. These two Rules force the material chosen for the respective body to "no material" and in combination with the "Hide object, if no material" option we activated earlier in the Material Groups, the respective body will be hidden completely in this case.
      Result: For the bodies it looks ok now, but the heads do still not behave.
  3. Add two more Rules, this time we use Equal Index:
      a. "Vampire Body" and "Vampire Head" use equal indices
      b. "Zombie Body" and "Zombie Head" use equal indices
  4. These two Rules now force the head material to be chosen according to the chosen body material,
      Result: We are done!

NOTE: This is a pretty extreme example of how Rules and Chance settings severely reduce the number of combinations, which can be generated. Let's assume we have ten materials in each of the four groups (with None included this makes eleven possible choices per group), plus the "Dummy Group" (which doesn't even add uniqueness, rather the opposite!).

- In best case we could get:
  11 * 11 * 11 * 11 * 3 = 43935 unique combinations
- We locked None to 0% in all groups, which leaves us with:
  10 * 10 * 10 * 10 * 2 = 20000 unique combinations
- Via the Equal Index Rules we actually locked two groups to be the same as their counter parts.
  Now, it's only: 10 * 10 * 2 = 200 unique combinations

- Finally, the Force Pair Rules say, it's only either a zombie or a vampire.
 We end with: 10 * 2 = 20 unique combinations

20 unique combinations of vampires or zombies, that's all there is left.
This is not a limitation of Asset Juggler, but cruel reality of mathematics.

If more than these 20 combinations are requested for the series in this setup, Live-Preview will start to feel sluggish and Generation will take significantly longer, as Asset Juggler fights a lost battle, looking for unique combinations, where there are no more.

Lastly this "Dummy Group" is also a nice example, why Asset Juggler can not easily provide an exact maximum number of unique combinations possible, but instead only provides a rough guess of an upper limit.

And here are our vampires and zombies:
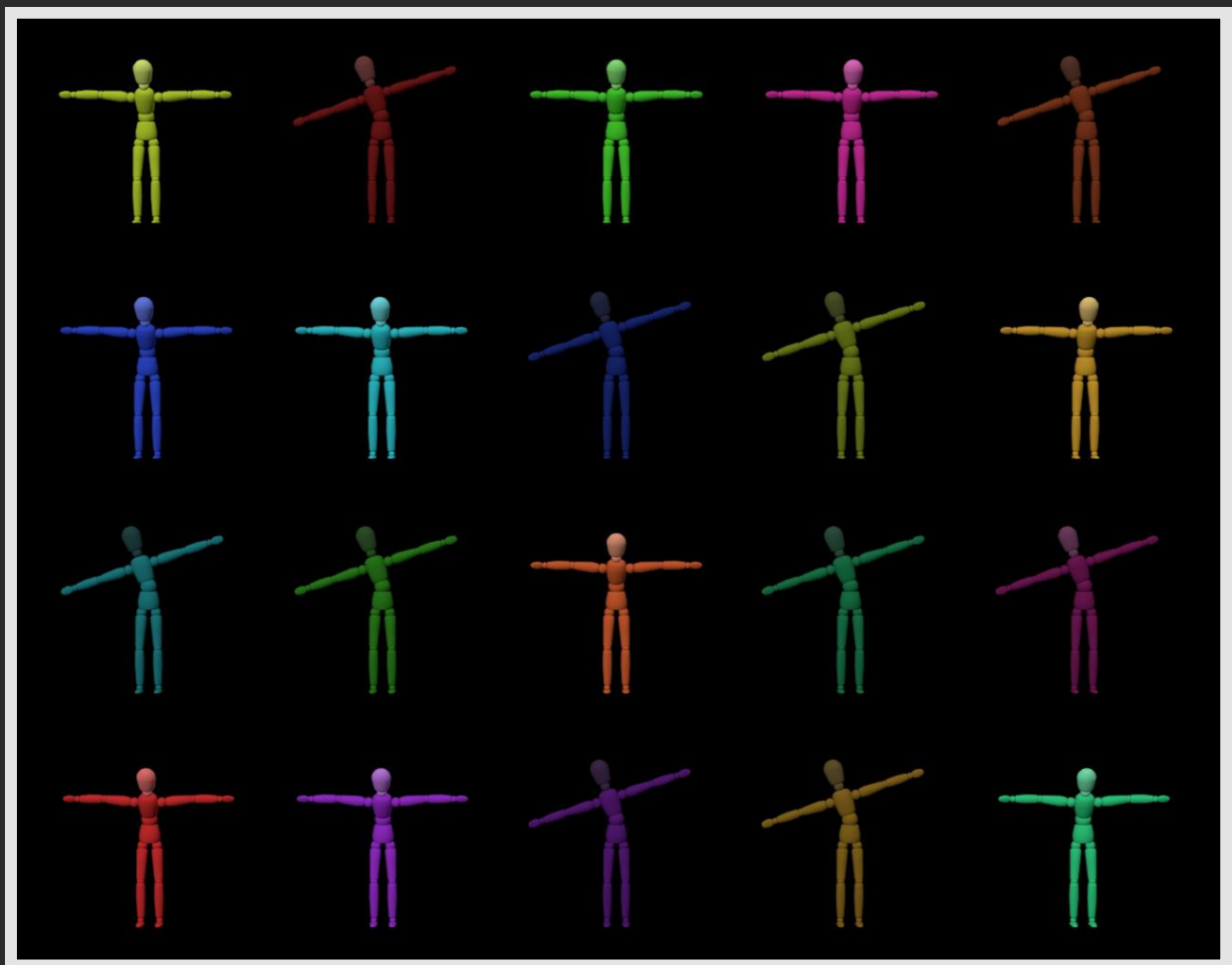
Pretty sure, everybody immediately recognizes the vampires and zombies.
Hopefully we are better developers than artists...

Limitations

- Cinema 4D is blocked during Generation (usually a short moment) and Baking (as this takes time, it's more obvious here). Unfortunately, Cinema 4D's current API allows to show progress in a reliable way, only under certain conditions.
  This can be solved, but the technical implications are not negligible. Fixing this would need some reasonable amount of sold licenses to be feasible for us.
- Xrefs can be a pain, for users as well as developers. When baking into separate project files, any created Xref ends up in a rather strange "zombie" state. We believe this is a bug on Maxon's side and we currently do not see, how this could be fixed on our side. The fun part about this bug, it leads to the exact behavior we want to get. The Xref'ed projects appear and work in the final series, without Xrefs causing any additional harm due to being "too alive". Workaround: Disable Xrefs when baking.
- Asset Juggler does not track changes to assets in Asset Groups. There is a manual update command, but we do not consider this a good solution.
  We recommend assembling all assets before starting in Asset Juggler.
- When projects from Folder or Project Groups get imported (opposing to be Xref'ed) all texture paths (all paths to external assets to be precise) get converted into absolute file paths.
- Using Alembic or FBX files in a Folder Group will cause Xrefs (if enabled) to open an import dialog, whenever these get created. Unfortunately, there is no way to avoid this behavior. Workaround: Disable Xrefs.
- Live-Preview will change the undo stack if Folder Groups are involved and Xrefs are enabled. This is just another shortcoming of Xrefs and we have no means to avoid this. Workaround: Disable Xrefs for Live-Preview.

Release History

Version	Date	Changes
1.0	2022-03-30	• First release
1.1	2022-05-02	• Added: Options to use normal Instances instead of Render Instances for Live-Preview and Baking (useful, if Hair or other features incompatible with Render Instances is involved). • Added: Added Texture tag options in Material and Material Override Groups configuration. Note: Also see Asset Group on hidden function of Material layer link field! • Added: Report prepared for Cardano • Added: Button to Lock None to Zero for all groups at once. • Fixed: Asset Group and Rules tabs not correctly restoring their enabled state. • Manual: New features, added notes, added parameter defaults and did inevitable corrections.

1.2	2022-06-10	• Added: ANY option for Asset 1 of Rule Types "Force Pair" and "Exclusion". With ANY the rule works only One Way and enforces Asset 2, if Group 1 is not None.
		• Added: CSV reports per Asset Group, contain comma separated asset indexes, for use with Asset Group CSV advanced option
		• Added separate commands (in menu Extensions -> Asset Juggler):
		   o **Folder to Render Queue**
		     Sends all project files found in a folder to C4d's Render Queue
		   o **Split JSON Metadata**
		     Splits a JSON file with a top-level array into separate JSON files, one per array entry.

1.3	2022-06-12	• Fixed: Crash bug (in versions 1.0 to 1.2)
		   o Have Asset Juggler project and Asset Juggler dialog open (with Live Preview enabled)
		   o Close Asset Juggler dialog
		   o Close project
		   o Either load an Asset Juggler project (e.g. Open Recent) or switch to another Asset Juggler project already open

		○ CRASH: Open Asset Juggler dialog again ● Fix: Border of popup dialogs was not shown in Cinema 4D S26