

Reactive Rig Painter

Collision is a separate finishing pass

Rig Painter owns generated bones, weights, chains, and links; it does not create or configure collision. After the bake is moving correctly, use Smart Collision Manager to author and synchronize the collider set. Then inspect each generated chain: any body collider that the rig already touches or intersects in its normal pose must be added to that chain's Excluded Reactive Colliders list.

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The **Reactive Rig Painter** creates reactive bones and skin weights from painted mesh regions.

Open it from:

Tools > STL Dynamics > Reactive Bones > Rig Painter

The workflow is non-destructive: the original source mesh is retained, a separate generated mesh is written, and the recipe stores your painted weights and generation settings.

Rig Painter owns **rig generation**, not collision. All collider generation, collision-radius tuning, world collision, and connected-set synchronization are handled later in the **Smart Collision Manager**.

1. Target Mesh

Supported targets:

- SkinnedMeshRenderer
- MeshRenderer with a MeshFilter

A static mesh can be converted into a skinned generated rig during baking.

Scene instance or Prefab Mode required

Do not paint a raw prefab asset directly from the Project window. Open the prefab in **Prefab Mode** or use a scene instance.

Read/Write must be enabled

Painting requires readable vertex data. If the source mesh is not readable, the window offers:

Enable Read/Write and Reimport

This changes the model importer and reimports the source asset.

Posed skinned meshes and transform safety

The Scene brush follows the currently skinned pose, while generation remains anchored to the source skin/bind relationship.

The V1 baker protects the source renderer and original skeleton from authoring drift:

- the renderer and original skeleton local position, rotation, and scale are snapshotted before generation;
- those transforms are restored if generation causes any authoring-time drift;
- generated bind poses are calculated from the **actual generated bone world transforms** plus the anchor's original bind-space relationship;
- imported FBX/armature pre-rotations are therefore not allowed to rotate or lay down the character as a side effect of generating a reactive rig.

If a skinned character starts in bind pose and a generated result would leave it out of bind pose, the baker aborts and rolls the operation back instead of leaving the source character moved or rotated.

Painting a visibly posed character is still supported, but stable original-skeleton anchors remain the safest choice for repeatable rebakes.

2. Paint Recipe

A **Reactive Bone Rig Recipe** stores:

- source mesh identity and vertex count;
- color-coded paint layers;
- paint weights;
- root/tip selections;
- generation settings;
- profile assignments;
- additional renderer integration settings;
- generated mesh reference.

Create one with **Create New Recipe...**

Recipes are topology-dependent. If the source mesh vertex count changes after the recipe is created, create a new recipe rather than applying old vertex weights to new topology.

3. Layer types

Each layer represents one generated reactive region and eventually one generated chain.

Hair

Best for flexible hanging or strand-like regions.

Default generation favors a multi-bone centerline and, when no profile is assigned, creates a profile based on **Long Hair**.

Tail

Best for directional appendages such as tails, feathers, straps, stalks, and similar elongated shapes.

If no profile is assigned, the first bake creates a profile based on **Animal Tail**.

Jiggle

Best for short, compact soft-body motion.

Jiggle layers start with a small bone count and use a guarded maximum deflection on the generated chain to reduce folding through the anchor during fast animation.

If no profile is assigned, the first bake creates a profile based on the included **Breasts** soft-jiggle preset. You can replace or retune that profile for any non-anatomical soft-body use.

4. Layer settings

Layer Name

A readable name used in generated object naming and diagnostics.

Mode

Hair, Tail, or Jiggle.

Color

The Scene overlay color for the layer.

Bone Count

Number of generated bones, from 2 to 32.

Use the fewest bones that preserve the shape you need. More bones increase deformation flexibility and simulation cost.

Root Blend

Controls how much of the generated chain transitions from the original anchor into generated weights.

Increase it when the attachment looks too abrupt. Decrease it when too much of the base should remain firmly attached to the original skeleton.

Path Smoothing

Smooths the generated centerline for Hair/Tail-style paths.

Weight Smoothing

Smooths final skin influence transitions.

Physics Profile

Optional reusable `ReactiveBoneProfile` for the generated chain.

If left empty, the first successful bake creates a default profile beside the generated output mesh and assigns it back to the recipe.

5. Anchor Mode

The anchor is the existing Transform that receives the generated chain.

Automatic

Scores the existing skeleton influences across the painted region and chooses an anchor automatically at bake time.

This is the recommended default for normal character meshes.

Explicit

Pins the generated chain to a Transform you choose.

Use this when:

- automatic selection picks the wrong skeleton area;
- the region is attached to an unusual prop/socket;
- you need deterministic placement across rebakes.

For skinned meshes, use an original skeleton bone whenever possible. An anchor outside the original bone hierarchy can still work, but rebaking may need to fall back to the current Transform pose.

6. Root and Tip

The generated centerline runs from a painted **Root Vertex** to a painted **Tip Vertex**.

Use:

- **Auto Root / Tip** - chooses endpoints from the painted region;
- **Pick Root** - click a Scene vertex manually;
- **Pick Tip** - click a Scene vertex manually;
- **Swap** - reverses root and tip;
- **Clear** - removes both selections.

A bake requires distinct valid root and tip vertices for every painted layer. If they are missing, the baker attempts automatic endpoint selection first.

7. Scene Brush

Brush modes:

- **Paint** - increases weight.
- **Erase** - decreases weight.
- **Smooth** - blends the selected area toward neighboring weights.
- **Pick Root** - selects the nearest triangle vertex as the root.
- **Pick Tip** - selects the nearest triangle vertex as the tip.

Controls:

- **Left Mouse** - paint/use the active tool.
- **Alt** - temporarily release the painter so normal Scene navigation works.
- **[** - reduce brush radius.

- **] - increase brush radius.**

Brush settings:

Radius

World/scene brush size relative to the target mesh.

Strength

How quickly weights change with each dab.

Hardness

Controls center-to-edge falloff.

Paint through nearby surfaces

Includes nearby mesh surfaces instead of restricting the stroke to the visible surface.

Useful for thin tails, ears, feathers, or cloth when front and back should receive similar weights.

Front-facing vertices only

When Paint Through is disabled, this can prevent a brush stroke from leaking around to back-facing geometry.

Show all layer colors

Displays all stored layer masks together instead of only the active layer.

Important: the color overlay shows the **stored recipe paint weights**. Auto Root/Tip, generated bone distribution, and rebuilding do not replace or clear the painted mask.

8. Painted islands

The painter reports the number of disconnected painted components.

Disconnected islands are supported. If a painted island cannot be connected through mesh topology to the selected endpoint path, Reactive Bones spatially attaches it to the generated chain while unpainted islands keep their original weights.

This is useful for:

- feather cards;
- separated hair cards;
- layered shells;
- modular mesh pieces stored in one renderer.

9. Generate and Bake

The bake section controls generated bones, weights, chains, and output mesh data.

Max Influences

Maximum final bone influences per vertex. Four is the safest general cross-platform choice.

Collision is not generated here

Rig Painter intentionally does **not**:

- generate Reactive Bone Colliders;
- assign connected collider sets;
- create/update collision groups;
- configure world/Unity collision;
- tune connected chain collision radius.

This keeps rig generation deterministic and gives both generated rigs and existing rigs one shared collision workflow.

After the rig is generated and its motion is correct, open:

Tools > STL Dynamics > Reactive Bones > Smart Collision Manager

Generate / Rebuild

The first bake button reads:

Generate Bones, Weights and Reactive Chains

After a generated rig exists it becomes:

Rebuild Reactive Rig

The generated mesh must be saved to a separate `.asset` path. Reactive Bones prevents the generated output from overwriting the source mesh.

Before completing the bake, the baker verifies that protected source transforms have not drifted. For a character that began in bind pose, a bake that would alter the bind orientation is rolled back instead of being accepted.

10. Rebuild and Restore

Rebuild Reactive Rig

Re-runs generation from the stored recipe, allowing you to change:

- paint;
- bone count;
- endpoints;
- smoothing;
- profile;
- additional renderer behavior.

Collision is not part of the rebuild recipe. Rebuild the rig first, then replan or synchronize collision from the Smart Collision Manager if the generated hierarchy changed.

Restore Original Renderer

Restores the original mesh/renderer setup and removes generated bone hierarchies from the scene.

The paint recipe and generated mesh asset are kept, so the rig can be rebuilt later.

11. Additional Skinned Mesh Renderers

Additional renderers are for modular characters and multi-renderer models.

There are two very different integration modes.

Shared Armature Weight Transfer

Use when the additional renderer uses the **exact same bone Transforms** as the main renderer.

Typical examples:

- eyes;
- feathers;
- clothing pieces;
- body accessories already skinned to the same armature.

Weight transfer modes:

Rigid Follow

Samples one reactive weighting for the entire additional renderer. Good for small rigid-ish parts that should follow the painted region as a unit.

Surface Follow

Samples the main painted surface separately for each additional-renderer vertex. Better when the additional mesh spans a larger painted area and should deform with spatially varying weights.

Max Transfer Distance can reject a transfer when the nearest painted source region is too far away. Zero allows nearest-region transfer at any distance.

Similar Armature Pose Link

Use when the additional renderer has its **own separate but similarly named/sized armature**.

Typical example: a modular hair prefab with its own `Head`, `Spine`, etc. bones instead of references to the body's exact Transform instances.

The link:

- matches recognizable equivalent bone names;
- drives matching animation bones from the character armature;
- preserves unmatched child bones;
- allows the linked part to keep its own Reactive Bones recipe and Physics Profiles.

After creating the link, select the linked renderer as its own Rig Painter target if you want to paint and generate independent hair/cloth physics on that part.

Options:

- **Preserve Bind Offsets** - keeps the modular part's authored placement relative to matched bones.
- **Synchronize Bone Scale** - also copies matching bone scale. Disable when the two armatures intentionally use different local scale conventions.

If zero matching bones are found, the window reports an error. Use recognizable equivalent names such as `Head`, `Spine`, `LeftArm`, or common prefixed variants.

Suggested painting strategy

1. Paint a little wider than the region you expect to move.
2. Keep the base/root area at lower weight instead of painting a hard 100%-to-0% seam.
3. Use **Smooth** around attachment borders.
4. Start with fewer generated bones.
5. Preview the generated path before baking.
6. Confirm the character renderer and original armature remain in the exact authored position/rotation after generation.
7. Test motion before spending time on collision.
8. Open **Smart Collision Manager** only after the generated rig is behaving correctly.
9. Rebuild freely - the recipe is the source of truth.