Create an Avatar with Flow

Overview

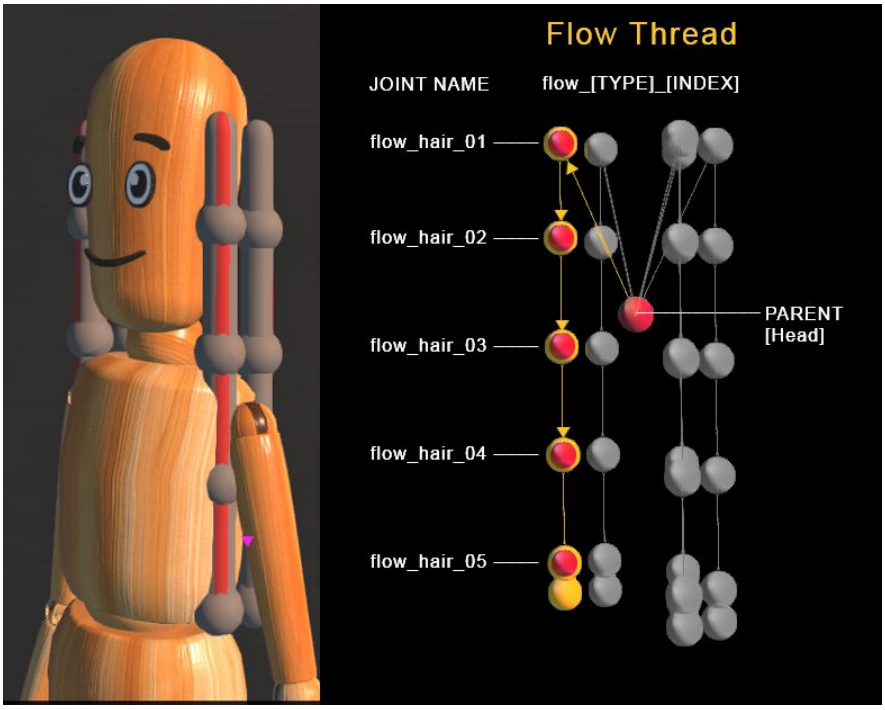
You can simulate physics on your avatar's hair, clothes, and body parts with a little bit of scripting and the help of High Fidelity's Flow script technology.

The Flow script simply mimics the natural movement of hair and other attachments on your avatar. You can manipulate and change how Flow interacts with your avatar using the Flow App. In order to use the Flow App, your avatar must contain flow threads.

Flow Threads

A *flow thread* is a set of connected joints where at least one joint complies with the following rules:

1. The first joint is connected to an existing avatar joint (“Hips” for example).
2. Every joint in the thread should be named flow_[TYPE]_[INDEX] or sim[TYPE][INDEX].
    - TYPE defines a group of joints that share a common physics setup and INDEX is an integer. For example, if the thread is used to simulate a skirt, all the “skirt” joints should be named flow_skirt_01, flow_skirt_02, etc.

3. 

Flow App

After you ensure that you have the proper flow threads, run the Flow app to enable flow for your avatar.

See **this document** for more information on how to run a script or app in High Fidelity.

Below are details and descriptions of the Flowv>>>>> app's functionality that will help you control and manipulate your avatar's flow.

Display Panel

This panel helps visually debug your Flow script.

- **Avatar**: This setting hides or displays the avatar mesh.
- **Collisions**: This option allows you to activate or deactivate collisions.
- **Debug**: This option hides or displays the debug shapes.
- **Solid**: This setting enables either a solid or wireframe display for debug shapes.

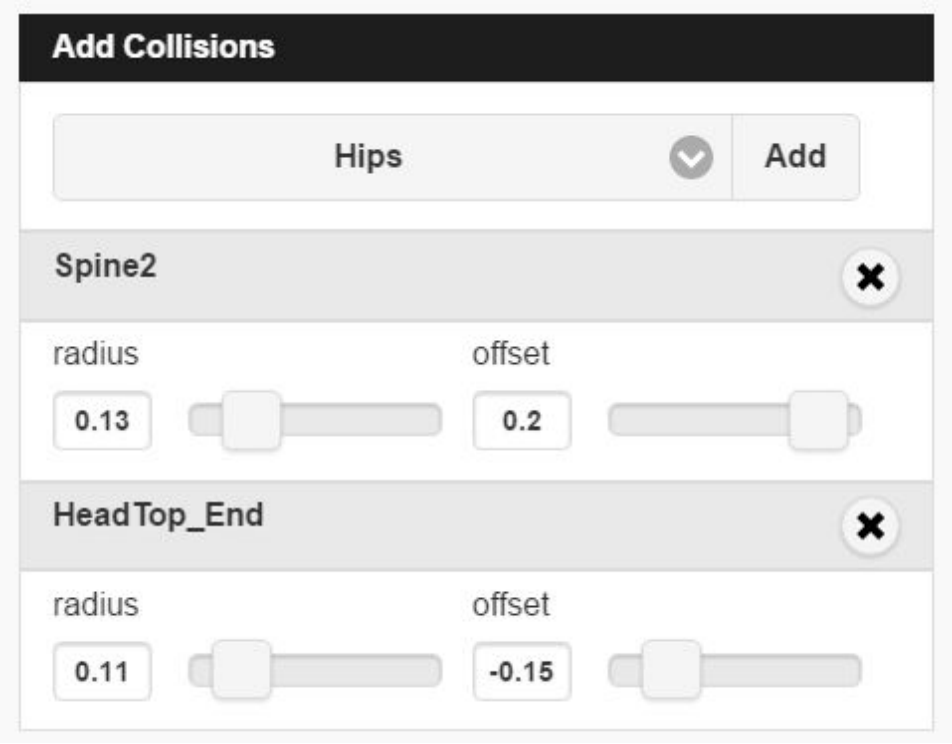
Joints Panel

This panel manages all motion related to joints.

- **Radius**: This setting determines the thickness of segments and knots (needed for collision testing).
- **Gravity**: This option sets the Y-value of the gravity vector which represents the direction of gravity as it relates the flow thread.
- **Stiffness**: This option changes how stiff each thread is.
- **Damping**: This option determines the amount of joint oscillation.
- **Inertia**: This setting changes the rotational velocity.
- **Delta**: This option controls the amount of time between each integration step.

Collisions Panel

This panel manages collision spheres. Every collision sphere is positioned using an existing avatar joint and offset.

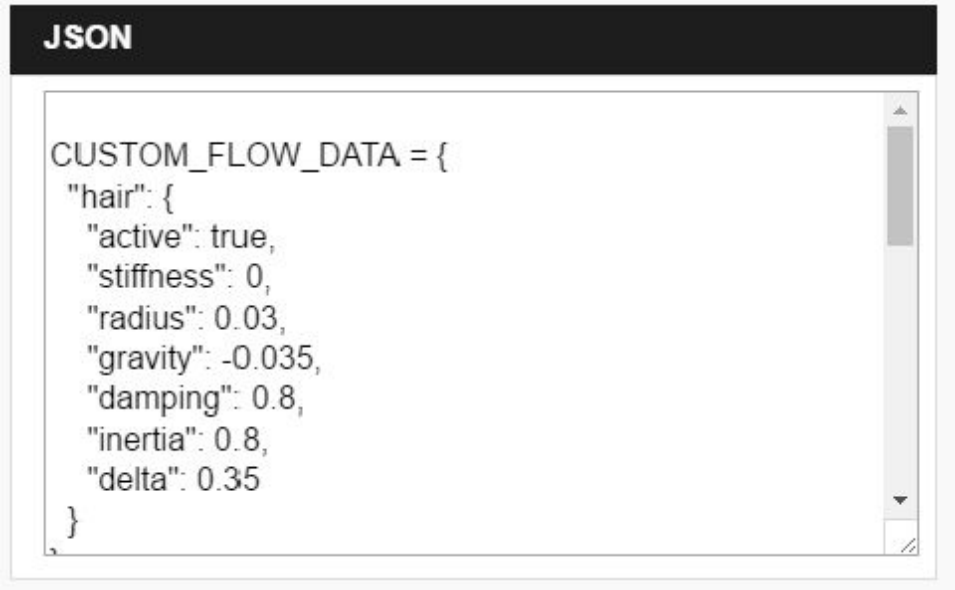


- **Radius**: This option controls the collision sphere radius.
- **Offset**: This option changes the Y-value of the offset vector along the joint.

The maximum amount of collisions is defined by the global COLLISION_SHAPES_LIMIT = 4.

JSON Panel

This panel displays the output data structure with your avatar's flow configuration.



This data can be copied and pasted into the Flow script between the lines:
`// CUSTOM DATA STARTS HERE`
`Erase existing code and paste new code here`
`// CUSTOM DATA ENDS HERE`

You can now run the modified Flow script to see your work in action.

Avatar Examples

Here is an example of an avatar that is rigged appropriately to use with Flow: Mannequin with Hair