Alexis Behilo | Project 3 | VSFX 350 ~ Spring 2021 | Houdini Version 18.5.351

Project 3: Procedural Animation

Whale Automata | Technical Guide & Breakdown

Rendering Statistics

Renderer	Mantra
Average Render Time	6.5 min/per frame
Image Resolution	1280 x 720
Number of Lights	2 → Sun and Skylight

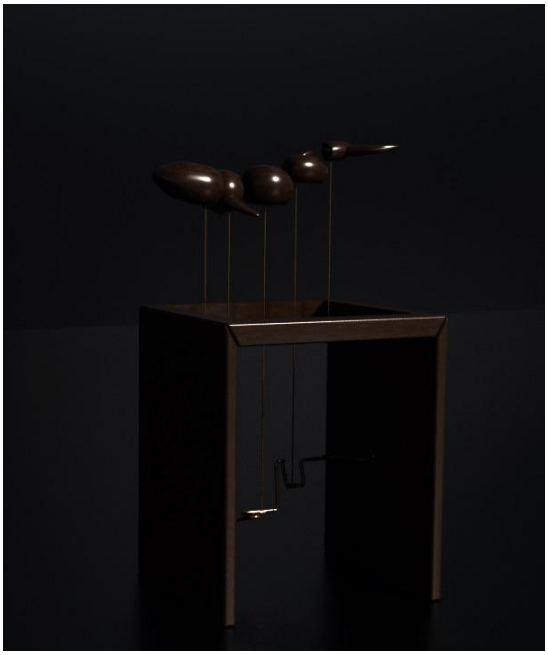
Sampling

Min Rays	5
Max Rays	9
Noise Level	0.01
Global Quality	1
Diffuse Quality	4
Diffuse Limit	1

Complexity of Geometry

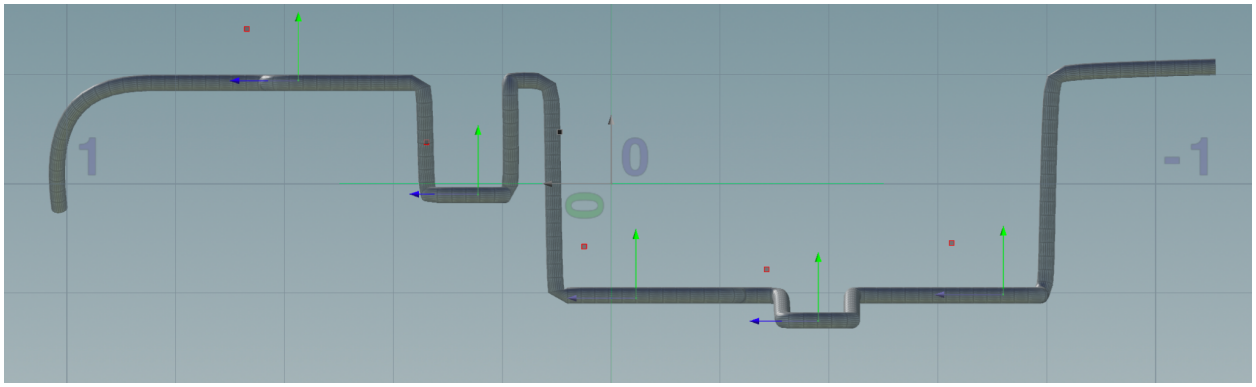
Objects	10
Points	56,191
Prims	32,717

Project Description

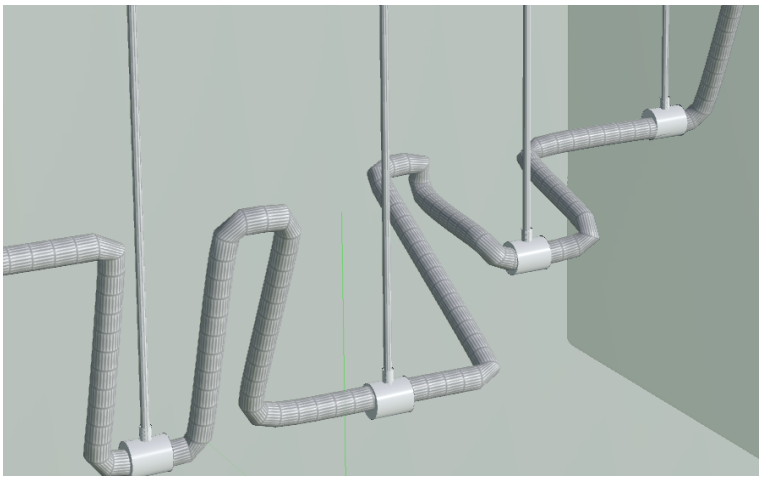
For the Procedural Animation project, I decided to create a whale automata based on a reference I found. In the reference, the wires bend and warp as you turn the bottom wire. I decided to make my simpler and instead make my wires straight instead of bending.
Reference: https://laughingsquid.com/migaloo-white-humpback-whale-kinetic-sculpture/

Technical Guide



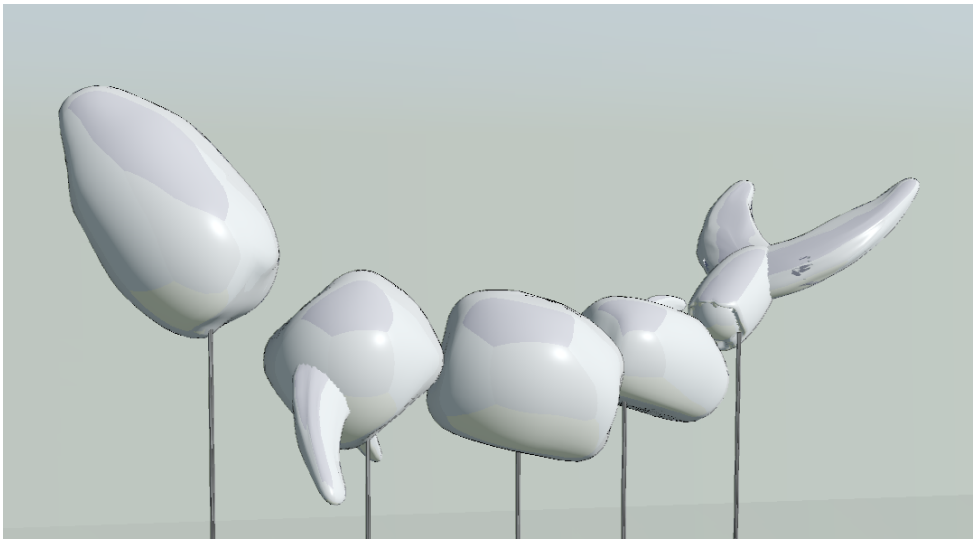
Modeling the Wire
In order to get the movement of a whale swimming up and down, I needed to model my base wire into the correct shape that the reference had. I used a “pathdeform” node to extrude a wire

along a curve I created. I also needed to use the “add” node to add points to the areas that the wires would be attached to.



Two Point Constraints

To get the wires to attach to the main rotating wire without any intersection happening. I used two point constraints. I based it off of the demo “dotPythagoreanInActionColorPointWrangle” file that Professor Fowler had made. The wires would follow the points that I had added which were attached to the rotating wire while staying straight up so it looks like the wire is sliding along with the rotating wire.

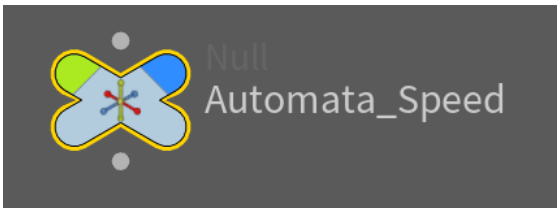


Whale Body Parts

The whale body parts were made by making a nurbs sphere and editing the points of the geometry. To make them stay on top of the stick wires, I translated them up to the top of the wire and they moved along with the rotating wire.

Whale Body Rotation

In order to get the movement of the whale rotating up and down, I rotated the x and y movement of the whale body parts. I was able to change the angle and the speed of the rotation using the above expression and match it to the speed of the bottom wire rotating.



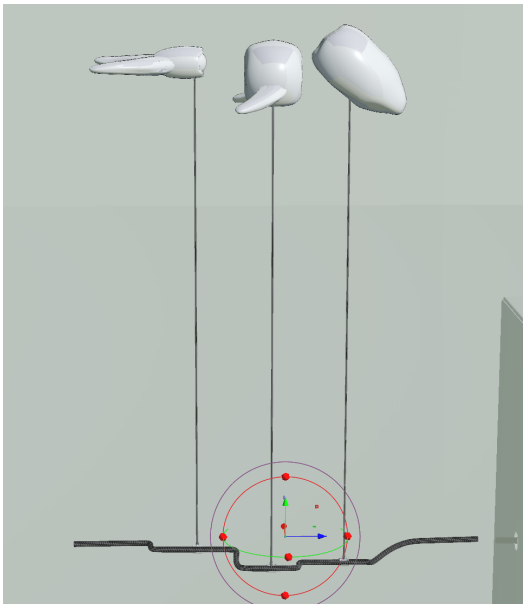
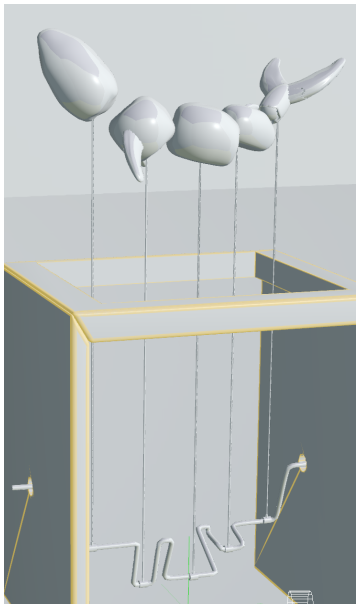
Controls

I added a control for the speed of the Whale Automata movement by referencing the areas that there is animation added and made the slider so it would add 1 to the speed. Increasing the slider increases the speed and decreasing the slider decreases the speed.

Problems Encountered and Solutions

Intersections

At first I wasn't sure how to stop making my "stick" wires intersect the rotating wire. I tried the add node method, which made it intersect everytime it rotated. I also tried intersection analysis, but I wasn't able to get it to work, and I had realized that that wasn't the best method for my automata. After I looked at two point constraints on Professor Fowler's website, I knew that was the method I needed to use.

Not Enough Whale Body Parts

Because for my automata I was using “sticks” for my wires to hold my whale’s bodyparts, I needed to add two additional stick wires to make my whale look complete. I needed to redo the bottom rotating wire. I had to figure out where I could add parts to my rotating wire in order for it to be mechanically correct.

Houdini Crashing

Houdini kept crashing on me at some points. I got used to saving every minute so luckily I didn’t lose anything, but it did get annoying at times.