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Modeling Devil Stick Tricks:

Math 198 Final Project

Pre-Proposal

Objective:

The objective of this project is to model a variety of Devil Stick tricks using Javascript, 3.JS and HTML.

Background:

I have been doing devils sticks for nearly six years now, but have never seen a digital rendering of tricks. Devil sticks consist of three sticks: two hand sticks and one weighted, for balance, middle stick. The two handsticks are used to manipulate the middle stick. Timing is a major key for keeping control. This is one reason why having a digital model will be so interesting as the timing can be easily controlled and kept consistent, thus eliminating some of the human error. I like that I will also be able to change the speed in the animation to essentially see the tricks in slow motion. There may be some roadblocks, such as attempting to add realistic gravity, but I believe I can overcome them.

Goals:

The ultimate goal of this project is to model five different tricks:

1) Tossing the middle sticks up and down using the two hand sticks simultaneously. This is a basic trick that is generally one of the first things learned.

2) Spinning the middle stick in a vertical circle around one of the hand sticks. This trick is fairly tricky to master as it requires great control and timing to keep the middle stick balanced. The idea behind this is to rotate one of the handsticks in small circles with the center sticks balanced just off center.
3) Spinning the middle stick in a kind of elliptical path (called a helicopter) using both hand sticks. Here you alternate handsticks to control the middle sticks in the horizontal elliptical path.
4) Tossing the middle stick between the two hand sticks (called idling). This trick as the name “idling” suggests is a kind of in between trick that it easy to control and transition to other tricks.
5) Rotating the middle stick around one of the hand sticks in a horizontal circle. This is one of the most difficult tricks to master as it requires a lot of awkward wrist movement. I expect this will also be a challenge to model, especially the movements of the hand stick.

For this project I would be using Three.JS. One key to success for this project will to make it look realistic using textures, lighting, and hopefully gravity. The texture and lighting, as well as other features that will help me make the model look realistic, are built into Three.JS. I will start by modeling the movement of the center stick for each trick and then add in the hand sticks. In addition to the digital model I would like to include videos of me doing all of the different tricks for a side-by-side comparison. A side goal of this project would be learning website design and another one would be learning how to use LaTex for my documentation.