Modeling Devil Stick Tricks
MA198 Project Proposal

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Abstract

The objective of this project is to model a variety of Devil Stick tricks using Javascript, Three.JS and HTML. The project will show the movement of the middle sticks as well as the two controlling handsticks. To make the animation more realistic I will be adding hand-like attachements so it appears that it is a person using juggling sticks rather than simply the sticks floating in mid-air.

1 Background

I have been juggling devils sticks for nearly six years now, but have never seen a digital rendering of the tricks. Devil sticks consist of three sticks: two hand sticks and one middle stick weighted for balance. 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. This reduces some 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. I have always found it hard to explain to people what I am doing with handsticks and when I show them in real time they rarely understand. Being able to slow down a trick could also be a good way for someone to learn how to use Devil Sticks.

2 Project Details
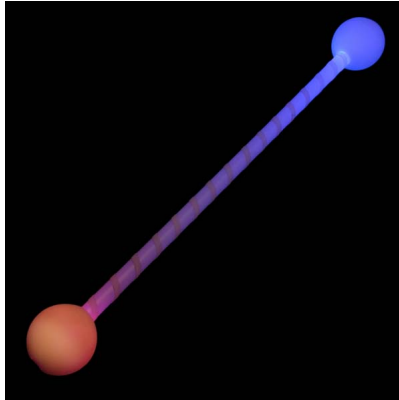
The goal of this project is to model five different tricks. In addition to the digital model I would like to include videos of me doing all of the different tricks for a side-by-side comparison, fitting in with the possilbe application of being a teaching tool. Side goals of this project would be learning website design and learning how to use LaTex for my documentation. I will be learning how to use Javascript and Three.JS better as I progress through the project. The five different tricks represent different difficulties to perform. Here I provide desriptions for each of the tricks.

2.1 Toss Up and Down

This trick envolves tossing the middle stick up and down using the two hand sticks simultaneously. This is a basic trick that is generally one of the first things learned. It is considered easy as there is no need to balance the middle stick on one stick at any time. Both handsticks can be used to stabilize the middle stick when catching it.

2.2 Idle

Tossing the middle stick between the two hand sticks is 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. Idling is one of the most common filler tricks due to this ability to transition so easily. In order to control this trick generally you want to hit the middle stick slightly above center and allow it to rotate onto the other hand stick. It is best to use as little force as necessary in order to keep the middle stick under control.

2.3   Vertical Spin

Here the middle stick is spinning 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.

2.4   Elliptical Spin/Helicopter

In this trick you alternate handsticks to control the middle stick in the horizontal elliptical path. This trick can be quite difficult to control as you are making minimal contact with the middle stick. This, like the idle trick is frequently used as a transition between two different tricks or as a way to start a trick.

2.5   Horizontal Spin

This is one of the tricks you can transition to from the helicopter trick. The idea here is to use one of the handsticks to toss up the spinning middle stick up and down. This is a combination of mutiple of the previous tricks making it one of the most complex tricks.

3   Project Steps

1) Create a realistic model of the middle stick and model its motion for each of the tricks using 3.js.
2) Add in the handsticks and coordinate their motions to fit with my model of the middle stick.
3) Once I have figured out the motion of both the handsticks and the middle stick, I will add in the hands glyphs to suggest hands, but not waste resources in modeling realistic hands.
4) Time permitting, make the RTICA aesthetically pleasing by simulating a flashing LED pattern on the ends of the middle stick, similar to a set of Devil Sticks that I own.

4   Timeline

Planned Schedule:

October 25 - Have all of the middle stick motion completly modeled and begin to model the handsticks.
October 28 - Seminar in class

November 10 - Complete working model of both handsticks and middle stick, begin adding the hands glyphs
November 19 - Full animation of middle stick and handsticks with hands and begin working on website.
November 30 - Minor fixes and aesthetics, begin working on final documentation.
December 8 - Final documentation complete.