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MA198: Introduction to Hypergraphics

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Proposal

Project: Visualizing the dynamics of swimming with HTML

While looking at the projects done in previous years, I became interested in the 3-dimensional projects, specifically the blobby man. My project will be different from those of previous years in that I will be programming directly into HTML. It is possible to program 3D figures in HTML using Javascript and CSS3. The HTML5 canvas property is an aspect that I hope to use but if 3-dimensional objects turn to be incompatible, I will resort to javascript and css3. I would like to program a version of the blobby man that is a swimmer. An advantage of using HTML is that I can make my program interactive for the user. For example, I could have buttons to adjust the speed at which the blobby man is swimming. I would use the typical options for speed of a fast, medium, and slow. Additionally, if time permits, I can give the user the option to choose a stroke for the blobby man to display. The possible strokes that I can program are freestyle, backward, butterfly, breaststroke, sidestroke, or the corkscrew.

Being a bioengineering, I am concerned with all aspects of the body. For this project, the most obvious connection would be the muscle usage in swimming, as each stroke highlights the use of different key muscles. To indicate this, I could highlight the muscles that are in use at different points of time during a stroke (This is similar to what Gillian Smith had done in her rendition of a bicycling blobby man in VPython). In addition, I could have the highlighting indicate the amount of strain on a muscle (some sort of gradient effect to indicate the strength: the darker the color means that there is more stress).

This would be useful to athletes to know what muscles they are using at what points. It would be helpful to them in order to avoid injuries by not placing a great amount of strain on a

muscle. It can also help competitive swimmers improve their times on their laps by finding the most aerodynamic form of the stroke.

I simply chose to do a swimming blobby man because I love to swim. I was on the swim team in high school. And, I also wanted my project to be different from the previous renditions (the workout man, the running man, and the bicycle man).

There are many steps I need to take in order to reach this end goal. First, I need to understand how the blobby man was made in its original VPython form. Next, I need to learn how to program simple immobile 3D objects in HTML. Next, I need to be able to animate them. Then, I need go to the next level and program the blobby man into HTML without any animation. Next, I need to add the animation to it by adding time dependence variables to the positions of the various parts. Finally, I need to add the user interactive touches.