Fencing Woman: Articulated Animation in VPython

Abstract:

For the past two years, I have fenced epee as a part of the UIUC Fencing Illini. I was a first time fencer when I began here at the university, and I am very familiar with the importance of mastering the basics of fencing. The basics include *En Garde*, *Advance*, *Retreat*, *Extend*, and *Lunge*. These positions and moves are at the heart of fencing. En garde is the traditional fencing stance. To stand in En Garde, the feet are shoulders width apart, the dominant foot is pointed forward and is perpendicular to the non-dominant foot that is pointed to the side. The knees are slightly bent as if sitting on a stool, and the body faces forward. Advance is how fencers move forward, and Retreat is how fencers move backwards. Extend is extending one's weapon into the target. Lunge is when a fencer lunges to attack their opponent.[1]

I am going to create a visual demonstration of the Advance Lunge. This graphic will be created using VPython. I will use previous MATH 198 projects for coding my project, and I will adapt it to make it my own simulation of fencing. My fencer will be able to do the following:

1. Stand in the En Garde position.

2. Advance forward using the correct fencing position and stance.

3. Extend her weapon and lunge forward hitting another unmoving fencer in the chest of the opponent.

4. Retreat back into En Garde.

5. If possible, have the weapon, when it hits the target area, curve as it would in the real world.

Project timeline and steps needed to create my project:

1. Learn how to make basic shapes on VPython. (Completed by October 13)

2. Create a puppet of a fencer on VPython. (Completed by October 27-31)

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[1] Howard,Richard."Essentials of Fencing Technique."(2006).http://www.acfencers.com/essentials.html

3. Make a video demonstration of me performing the attack and lunge. (Completed by October 27)

4. Manipulate the puppet into the En Garde position. (Completed by October 31)

5. Move the fencer forward in a proper Advance. (Completed by November 10)

5. Have the fencer attack by Extending their weapon arm and Lunging simultaneously. (Completed by November 20)

6. Have the fencer Retreat. (Completed by November 24)

7. Create my presentation for the class. (Completed by November 24)

8. Have my website be finished and up to date (Completed by November 30)

By the end of my project, I will have accomplished the following goals:

1. Learn how to use VPython at an intermediate level.

2. Be able to create a figure on VPython and have it move.

3. Understand the math behind my animation.

4. Become comfortable using TeXwins.

5. Updated my website throughout my project with what I have completed and have worked on.