Virtual Reality Design for Science Assignment #5: Final Project

Our final project for this class is to design an immersive, interactive virtual reality model for analyzing a scientific problem, the topic drawn from the work we have done so far with Steve. The first step is to determine a specific subject: you can continue work on a problem that you have already done for an earlier assignment, expanding and developing the representation of data, the interactive toolset, the animation and navigability of the model and the accuracy and density of the data visualized. Alternatively, you can move to a new topic, which can be configured in relation to a hypothesis of your own devising, but which grows from Steve’s interests. In this first development phase, we will be asking our scientist collaborator (Steve) to comment on the potential usefulness or interest of the basic subject matter of each project and we will consider together possible visualization strategies.

5.1 Research Hypothesis and Visualization Hypothesis

Lay out your subject as a research hypothesis: a proposal to study certain interaction of forms and forces to shed light on the relationship between track formation and hominid foot anatomy. The insight gained could be evidential (the particular shape of a fossil track) or mechanical (suggesting a contribution to efficiency of locomotion or other movement), evolutionary (leading to a change between or within species), or any other outcome or area of interest you can envision in consideration of Steve’s research. Your subject should include a role for all aspects of Steve’s research that we have studied and visualized so far this semester, including both substrate displacement and foot kinematics.

Your visualization hypothesis should outline a VR model, with time steps, analysis tools, viewpoint comparison or other visualization techniques constructed to allow efficient and fruitful study of your subject. You may draw on your responses to Assignments 3 and 4, but you should adjust any carry-over elements for relevance to your new topic.

Your model does not need to pinpoint any particular conclusion, but rather be a tool for examination and analysis. In fact, if your model ends up disproving your hypothesis, ideally suggesting an alternative way of thinking about the subject, that is also valuable.

You should expect to do some further research as you configure your subject: first looking through the research materials provided to us by Steve, and then if necessary looking beyond through the internet, library or other sources. Within limits, our Steve will be available to respond to questions about the science involved, but you should try to do as much on your own as possible.

By next week you should have a written proposal, which can include visuals, outlining your subject and hypothesis. You should also have sketches outlining your thoughts on how to set up a visualization to explore your subject, along with written notes as to how your visualization strategy will allow fruitful examination and insight into the problem posed by your research hypothesis. You will present all this orally to the class, but expect to hand-in a written version. Changes to the subject or hypothesis based on our discussions will be fine, but you should do your best to present a solid idea in this first iteration.

Our next assignment will involve fleshing out the plan for your visualization model, including a role for user interface and tool selection and scripting user interaction with a storyboard.