

Final Project Suggestions from Morgan and Steve

Steve and Morgan were both excited to see novel perspectives like the toe kite volume and kinematic volumes. For the previous assignment, they thought some of the combinations of 2-D and 3-D were very effective for showing what the tracks might look like while seeing the foot motion in context. Most of the sediment treatments were either planar or ribbon surfaces, so some consideration of smaller packets (if not individual particles) would be fun to see. It might help to remember that the simulations contain the 3-D position of each particle through time.

Some of the more abstract visualizations were appealing, for example Ruby and Yunan's volume comparison or Katherine's foot web with a stable metatarsus. These are just some recent examples of less literal and more memorable ways of exploring the data that they haven't quite seen and that were intriguing. Visual approaches that have been promising have been the ones which have started to create physical relationships between or among the variables they have been interested in.

As a rule, they are less interested in seeing their data as they've already visualized it. They have a pretty good handle on depth, so consider using color and line in other ways for other variables. It's fine to use Morgan's loops or our greenish PNAS images for reference, but feel encouraged to add more and suggest ways to compare.

Potential questions to explore:

How can we relate toe paths to fossil track surfaces at multiple depths? Consider using poppy seed foot motion and poppy seed track simulations. How does this compare to our simulation of the deep dinosaur track in Steve's PowerPoint?

How can we explore how the different parts of a foot's anatomy form different features of tracks at different points in time? Many of you have focused on the toe tips, but what other landmarks might be important? This is critical for reconstructing the movements responsible for forming a final track shape.

How does variation in foot motion impact variation in track morphology? Can we represent sediment motion simply enough so that similarities and differences can be explicitly displayed?

What would "entry only" or "exit only" tracks look like? Imagine a foot plunging down into a layered substrate and then stopping (entry only), or starting at depth with a fresh set of layers and then being pulled out (exit only). Would breaking a complete step cycle into smaller parts help tease apart the complex relationship between foot motion and sediment motion? What might the track of just one toe tell us?

During foot contact, many particles are displaced from their original positions to new positions; the sum of this reconfiguration is a track. How can the paths of individual particles tell a

narrative? Even if you don't know the exact particle paths or the forces responsible, toe paths and particle paths must be related.

Keep in mind that:

You don't always have to view foot or sediment motion in a fixed perspective. As we saw with the kite/curve representation of toe motion, a change in frame of reference can show the same data in novel ways.

We can only look at so many things at one time. Fritz delivered his PowerPoint images and videos one after another, rather than showing all of them simultaneously (which would be overwhelming). When you give your demo, think about what you want to show and where you want us looking as you progress through your narrative.

We welcome text and numeric information where needed.

Spend your effort and time on the tools for data interaction than on mocking up the details. We understand that CavePainting is limited, so don't forget these are sketches.