

Technical Brief #1 - "Dinosaur Prophecy" for NASA Immersive Earth







Creating the dinosaurs in the NASA Immersive Earth's "Dinosaur Prophecy" was a demanding full year of animation effort. The desired goal was known to be high from the beginning and we were aware that we would need to solve many technical problems to reach a believable level of look and movement for the audience. Dinosaurs have been seen many times in motion pictures, but usually the scenes are just a few seconds long... short enough to keep the audience believing.

Our fulldome script called for sequences lasting as long as two minutes without transitions to tell the story. Also, the background environments would not be simple ... some calling for flood waves, volcanic eruptions and asteroid strikes.

We started production while the script was still being defined, basically to get a head start on the tasks we knew would be time-consuming. We chose the dinosaurs that we would definitely include in the scenes so modeling could begin. Maya would be our modeling - animation rendering application. Eight animals in total were created. All the models were pologonal based. Although subdivision surfaces were considered, in the end, the decision was based on our higher experience level with poly modeling.

Texturing was handled in Adobe Photoshop using a simple UV mapping technique. Again we opted for this route because of past experience. The poly meshes of the animals were "unwrapped" and then painted as flat surfaces. The textures were then remapped onto the animals in their 3D form.

One very challenging part was the rigging or adding the control skeletons to



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Tom Casey - tom@hrpictures.com Home Run Pictures 100 First Avenue, Suite 450 Pittsburgh, PA 15222 412-291-8200 + http://www.hrpictures.com the poly meshes to allow animation. There are several different approaches to rigging and after some R&D, a soft binding approach seemed to provide the best control to create a believable muscle/ skin appearance. Modeling, rigging and texturing for each animal was about eight weeks of work.

Animation of each scene was very time consuming. The animator would do a portion of a sequence, we would render in fulldome format and review... go back, adjust, and continue. Background environments were created concurrently as the animal motion was progressing.

The backgrpund scenes required an enormous amount of R&D for the various particle effects needed to create a rain enspired flood wave overcoming a group of small dinos, a volcano burying some feathered creatures and a rain of glass nodules from an asteroid strike terminating the t-rex's rule. Cloudy skys were created from fisheye lens captured imagery or with the fluid dynamic module in Maya if motion was desired.

Creation of the furry/feathered creatures were simplified by using a geometry mapping technique. Instead of creating separate hairs or feathers, hundreds of single polygons were "painted" on the surface meshes, each with little painted images of a tuff of fur or a feather. Trees were created in a similar manner with thousands of leaves attached with painted images applied. Where motion was desired, Maya hair dynamics was used to automatically create movement.

A combination of SGI and Macintosh G5 Quad worstations were used for production. Rendering was accomplished using the Maya raytracer and a "virtual refracting lens" on an Xserve render farm with 80Gb of RAM. Some frames would take several hours each to fully render at final resolution. An outside rendering service with a 1000 processor farm was enlisted towards the end to finish in time for the premier showing.