

Partial list of Maya plugins I've written, March 2013

Emre Yilmaz
eyilmaz@pobox.com
415.786.9528

Most of these were written in C++, with a few exceptions in Python.

Deformers:

UV restoration deformer (in progress)

Relaxation and collision deformer (at Tippett)

"Dynamic Shape" deformer system-- cMuscle alternative-- collision, relaxation, sim deformers combined

Collision deformer

- Collider types: Explicit geometry, ie meshes, nurbs surfaces, nurbs curves. Implicit geometry, including capsules, spheres, ellipses, superquadrics. Also a little special-purpose "inside-limb" collider to keep forearm geo from smooshing into the uparm geo (or loleg / upleg).
- Optional offset maps on the deformed surface, and on the collider surface. These were meant to add detail-- this way a simple low-poly collider could be act like a more detailed one. These maps could be auto-snapshotted as depth maps or hand painted or both. The collider map also could optionally be an image instead of per-vertex offset.
- Several different collision algorithm options (some uses worked better with different collision tactics than others), for instance closest point and projective / directional point, line, plane, curve sources

Relaxation deformer

- Several different relaxation algorithm options, including relax length and preserve length
- Many parameters of the relaxation were exposed to give the user more control

Simple dynamic sim deformer

- A simple dynamic simulation (Verlet)
- Meant for cases where doing a full sim would have been prohibitive, or where user interaction was key (i.e., the animator needed to control the sim)
- Used for the animatable chains in "Marley's Ghost"
- Used for background characters' clothing sims in A Christmas Carol
- Used as part of an animation rig setup called "Dynamic Spline" which was an animation system for chains, ropes, reins, etc.

Half-completed aspects: I was working on a few additional features including self-collision, and better volume preservation under collision.

The combined-deformer system was used extensively at Image Movers Digital for all characters' body deformations, a little in the face, Marley's Ghost's chains, background character cloth sims, and objects like ropes, chains, and reins.

Reason for creating this deformer system was as a cMuscle alternative. Primarily we wanted to avoid some of the limitations of cMuscle, specifically its being a little too closely intertwined

with linear blend skinning as the initial pass. We wanted to be able to run it, for instance, on a wrap-based first pass.

Warp deformer:

- Written for the Ghost of Christmas Future (death robe guy) in Christmas Carol. It allowed taking a character or a piece of geometry, placing nurbs around it as something like a user-defined lattice, and pulling those handles around to resize and reshape the character like silly putty. The death robe guy needed to squash and warp into strange nonrealistic proportions to match his shadow; that was the main use of this.

"Silhouette Manipulation Device" deformer

- Also for the death robe guy, this allowed "drawing" a low res curve around a piece of geometry and dragging its pushpins around to reshape the character's silhouette.

Projective distortion deformer

- Also for the death robe guy, this allowed "projecting" his geometry flat on surfaces like stairs, walls, etc. so that he could then emerge from them in 3D.

Nodes:

PSD (Pose space deformation / JP Lewis) driver node rewrite at Tippet

Tool to "wrap" or "inverse-skin" joints to meshes (in progress)

Geometry tracking node-- we were simming some bags with nCloth that we wanted to replace with rigid geometry animated with a transform. This node used a simple real-time tactic to follow the nCloth simmed object and approximate it with its rigid equivalent, outputting the transform.

Utility node: Quaternion slerp (rotational interpolation) node

Utility node: Quaternion <-> Euler conversion node

Other:

"Move Brush" sculpting tool (Maya context)

Device drivers for legacy mocap equipment, i.e., Polhemus Fastrak, OEI-16 optical encoder interface (for joysticks, sliders, foot pedals)