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Demo Reel Breakdown

Priest (2011)

PRT_01: Provided art department with renders of delivered background plate projected onto modeled set along with an environmentally lit version of the modeled set for them to blend into a matte painting as a set extension. CG character was then integrated into this new background plate. Character's drool and rock interaction elements were generated by the FX department and passed on to me for lighting. Lots of subsurface scattering tweaks to dial in the director's desired look

PRT_02: Lighting occurred concurrently with look development of the crosses and particular attention was paid to the foreground hero cross. I reoriented the HDR environment map and painted in bright highlights to reflect off of the crosses using a diagnostic colored grid pattern at first to pinpoint coverage areas. Reflector cards and blocking geometry were also utilized during the ray traced reflection passes to accentuate and pop the highlights

PRT_03/04: Set extension, character, and FX elements lit and rendered

PRT_04/05: Set extension/replacement, props, character, rock FX elements lit and rendered

Mutant Land (2010)

MWS_01: Fully CG environment and characters. Created new geometry or adjusted existing geometry to accentuate lightning and fire lighting effects. Tweaked shader parameters to achieve a certain look with the displacement of the set or in the look of the characters. Provided the art department with a geometry matte for their background painting. The massive set created origin distance problems, which were solved with the assistance of members of the Matchmove, TD, and RnD departments. The discovery of the solution revealed a flaw in the pipeline regarding floating point precision that was eventually corrected and pushed out to the entire studio.

Cats and Dogs: The Revenge of Kitty Galore (2010)

CA2_01/03: CG character integration into a background plate. The lighting employed point-based approximate ambient occlusion, image based lighting using a HDRI, ray traced reflections/refractions (eyes), and indirect illumination with color bleeding as a supplement to direct lighting techniques. This shot also utilized baked color bounce to create occlusion shadows for foot contact with the ground plane. Provided the compositor with several different matte and shadow passes to integrate the character with the shaft of light, and the interaction of his feet with the set geometry.

CA2_02/04/05: Face replacement via blending an animated, motion tracked, and lit CG face rig with a warped background plate using a proprietary pRef (point of reference) process. Similar lighting techniques as used in CA 2_01 with the addition of shallow/deep subsurface scattering in the nose, ears, and mouth.

CA2_06: Crossover shot with Sony Picture Imageworks. Used ray traced reflections for the character's chrome teeth. Resolved matting issues of the fur with the Sony dog geometry for the compositor by attaching a matte object to specific animation joints. Created an animated lighting rig to match the interactive lighting of the background plate. Demanding resource requirements due to the long fur length required several render optimizations to help push this shot through the farm.

Piranha 3D Trailer (2010)

P3D_01: Three separate swarm elements in addition to animated hero characters in the foreground. Worked very closely with the animator, FX artists, and compositor over several animation, camera, and art changes to make sure things went smoothly over the course of the shot. Re-adjusted lighting to suit the new iterations, and provided the compositor with as much flexibility as possible given the short time-frame. Heavy render optimizations to accelerate machine usage and increase the number of lighting iterations possible.

P3D_02: Two separate swarm elements. Animated caustics using an optimized projection cucoloris on a roving light. Highly compressed delivery schedule dictated a shotgun approach to certain lighting characteristics (iridescence, caustics) whereby multiple light positions were used and their effects streamed out as separate arbitrary output variables enabling maximum flexibility for the compositor and minimizing setup time.

Breed (2012)

Group project at Bournemouth University. We worked together as a team to create a short narrative involving audio driven animation. I was mainly responsible for the first of the final three scenes and the RND/establishment of the audio driven CHOPS pipeline for geometry & shading.

BR_01: Created digital asset for generating various molecular shapes for the foreground left "egg." Worked closely with another team member to integrate his fluid simulation into the scene. Procedural shading of both FG hero elements and driving of modeling/shading via audio.

BR_02: Created a procedural diffusion limited aggregation system for a transformation effect along with VOP based shader blending, I generated a spherical lattice to transition from a stand-in fluid sphere to a new piece of geometry shaded by another team member.

Lumen (2012)

Directable FLIP fluid simulations with dynamic color mixing of variably viscous liquids. Emission intensity and color of custom shaders is driven by the pressure and velocity of the simulation. Heavily wedged the shader to during look development to dial in the overall aesthetic and determine a good balance between quality and render performance. Built the DOP simulation concurrently with a flexible VOPSOP so that colors were not baked in and could be easily adjusted via the simulation data and attributes. PFTrack was used to accurately match and build the camera and point data in anticipation of virtual camera moves which heavily aided set geometry modeling.

Built a distributed "nice" render queuing system within the university that automatically scouted for eligible nodes based on customizable criteria such as resources available and idle time. Delayed load techniques, Mantra IFDs and geometry stored on a server, and manipulating IFD data to render images locally on a node first helped reduce network traffic and load significantly.

Aquascape (2011)

Dry for wet conversion of a HDR background plate. Modeled and procedurally shaded hero gas mask, then key-frame animated and integrated it into the graded image. Camera projection onto dummy geometry created more detailed displacement for cast light pass and more accurate bounce light. All 3D work completed in Houdini and rendered with Mantra. Acquisition of water tank elements and all grading/integration composited in Nuke.

MST (2012) [work-in-progress]

A voxel based 3D multi-scale Turing pattern generator is used to create a solid texture for a pyro simulation driven mushroom mesh that breaks through a pre-fractured ground plane via a bullet simulation. Modeled after Jonathan McCabe's 2D algorithm as described in his paper: Cyclic Symmetric Multi-Scale Turing Patterns, and using Jason Rampe of Softology's blog post as a guide, I created a digital asset in Houdini using built-in operators that generates a 2D or 3D voxel grid that

can use an arbitrary number of scales and animated parameters. Also thanks to eetu from odforce.net for his tip on blurring volumes.

A static 125 million voxel grid generated via the asset is fed into a shader that uses the normalized volume density to modulate displacement and specular/reflection properties and is mapped to a color ramp to determine diffuse color. Further deformation occurs by another layer of noise at the mesh level, which is not given a rest position to highlight the volume texture.

A re-timed pyro simulation provides the source for the mesh, which inherits its velocity from sim's vel field for motion blur. The animated mushroom is used as a collider in a bullet solver simulation, breaking through ground glue constraints as it grows. The ground plane is pre-fractured with voronoi points that are center weighted via volume sculpting tools to concentrate smaller pieces at the point of impact.

Bounce (2013) [work-in-progress]

A virtual camera move using multiple projections merged via alpha blending through a layered shader in Houdini follows a bouncing ball of light. A custom system creates a bouncy FLIP fluid whose rigidity and plasticity are altered after each impact until it becomes a viscous fluid sinking down the drain.

Impact data is processed via CHOPS to calculate average and absolute impact strength across the range. The processed data is used to modulate lighting and shading parameters and control the light decay after impact.