



Q&A session about MAX PAYNE with the SPIN lead creative team

How did Spin get the project for Max Payne, and what was the initial brief given by the client?

Jeff Campbell, VFX Supervisor

We were awarded Max Payne (MP) based on a winning pitch test for the drug vision. The drug vision look was a big deal to director John Moore so as soon as he saw ours the deal was done. We beat out 11 other vendors so we were quite proud. In addition, we were awarded all the creature shots as we have a robust creature pipeline from just coming off a big feature called "Outlander" (The Weinstein Company).

The initial client brief was that this movie would have a very stylized look, somewhere between Sin City and The Departed. The Valkyries initially were to have very erratic movements but after seeing the slow motion animation on the Owen's death shot, it was decided to go with a more fluid movement, like they are under water.

To assure John Moore (JM) that our demon would hold up in full light, we did a side-by-side comparison between our CG demon and a makeup FX actor demon. He was pleasantly surprised at the high level of realism we achieved.

What input did Spin have on the creative direction of the project, and what were your creative and technical goals for the effects that you worked on?

When you do creature shots you have to be involved in the creative direction of the film. We are responsible for the performance of a lead character in the movie. It's very rewarding work. We were getting a client brief as far as the general intent of the shot, but it was up to us to come up with a cool performance that JM liked.

As with every project, we wanted to maintain an artistic integrity that reflected a unique, surreal insight into the essence of the movie. I like creating shots that have longevity. This movie has a quite a few that really stand out because of their originality and emotion they transpire. Creatively, we wanted the Valkyries to have personality rather than just motion.

As an artist, I use Autodesk Inferno to develop looks and to build certain elements to pass off to the compositors. It's high speed interactivity is ideal for trying out various elements to see what sticks. I can also work on a time line of a

sequence and swap out shots instantly to check continuity all at film resolution. Tools like this are essential for problem solving and keeping to a tight post deadline.

Aside from demanding high-end photorealistic finals, technically I want the effects to have all the subtleties. Things you probably cannot see but, subconsciously you can and if they were not there, you would think there is something wrong. Things like muscle dynamics and feather dynamics.

How did Spin initially kick-start the project, such as brainstorming, storyboarding, previz etc. and what initial processes did you go through?

Because of a limited schedule (15 weeks post), we had to start building the demon right away. I knew the wings are going to be challenging due to feathers and complex rigging. With every feather as geometry, render times will be expensive. We started accumulating bird research for texture, shape, and animation studies. Rob McCallum was good enough to supply us with detailed drawings of the demon body parts at different angles to let us start the build from scratch.

Please can you list all the software you used on the project

Autodesk Maya 8.5 - Modeling, Animation, EFV, texturing
Photoshop CS3 – texturing, Matte painting
Zbrush - 3dsculpt
Eyeon Digital Fusion 5.3 – Compositing
Autodesk Inferno 2008 - Compositing
Boujou - tracking
Syntheyes - tracking
Sitex Graphic's AIR - rendering
RealFlow 4 - simulations

Can you please describe IN DETAIL how Spin translated the original Valkyries artwork c into 3D models? What software did you use for this and what were the technical and creative challenges?

Erin Nicholson, Modeling Supervisor

I started modeling the creature based off of the physical reference of the actor, Mako Hindy, and the prosthetics that he wore as the demon on set. I went to the film set and took many reference pictures of Mako in his prosthetics makeup. I used the photos as a template and modeled the animation mesh in 3DS Max 2008 and then did the UV layout in Unfold 3D. The wings were modeled based on a concept by Spin's Bojan Zoric, Lead Mattepainter/Texture Artist. Placing the wing feathers was a little tricky and all of the larger ones were done individually or with path constraints, but I ended up using the Shave and a

Haircut plug-in included in 3DS Max 2008 to brush in some of the more random feathers on the top edges of the wings. The 3D sculpting of the demon body was done in ZBrush 3.1. Originally the demon model was supposed to match Mako's form and appearance almost exactly, but the model diverged from that in the early stages because John Moore and Everett Burrell both preferred the finer details in Rob and Chris' designs.

I took their high contrast inked designs and modified some of them into a texture template. In ZBrush 3.1 I used these textures as a mask and inflated unmasked areas of the model a little bit. I then sculpted the rest of the detail on top. The template/mask/inflate method saved a lot of time, because it didn't require me to sculpt in every single detail. It was a great base upon which to add finer details and it allowed time to sculpt some of my own ideas into the model, which ended up in the film.

Having worked with ZBrush before, there weren't any big technical challenges. It is a pretty straightforward workflow once you're comfortable with it. ZBrush's HD geometry did come in handy though, as it was able to handle models that other 3d sculpting packages couldn't at that time. I just had to increase the contrast of the 32 bit ZBrush displacements by setting the displacement tool intensity value to 512 before extracting the maps so that the rendering software would work out the displacements properly. Overall, it was a fun and relaxed creative experience.

Please can you describe IN DETAIL how the Valkyries were rigged and animated, and what challenges you were presented with here? How did you overcome them?

Glen Chang, Lead Rigger

The Valkyrie character had many animation requirements because it needed to simulate flight as well as achieve many extreme poses. Additionally, there were also several variations of the Valkyrie so the rigs had to be scripted and the body had to be rigged separately from the wings. The body rig was a regular biped system with reversed feet but the major concern of this project was the rigging of the wings. Because there were so many feathers, one of the biggest challenges we had was to design a rig that would allow them to move realistically and not be too overwhelming for our artists to control. We needed a rig that had simple controls to allow the animators to quickly shape the wing and not have to animate each feather individually. However, we didn't want to restrict total control from them so we needed the ability to toggle on controls that could animate everything down to each feather if they needed to.

We also needed a rig that could save them time by automatically simulating secondary animations and collisions for the feathers or add dynamic effects like wind and turbulence. Eventually we developed a 2-part animation/dynamic rig

with aid of the Maya Hair system and combined them both so that the artists can blend in or out the dynamic effects or let the dynamic systems take over completely. In the shot where the Valkyrie pulls Owen out of the apartment in super slow motion, the animator had total control of the rig and was able to achieve the perfect silhouette by animating each feather manually. Whereas, in the shot where the whole ceiling tears off into a fiery sky above Max Payne, the animator just let the dynamic system take over all the feather animations.

Jeff Campbell, VFX Supervisor

The wings were rigged and animated in Maya. All the Valkyries are keyframe animation. We found out in certain shots especially in tight locations, that the wings were too big so we added a god node to enable us to scale the wings separately from the body without affecting any keyframes.

How were the CG Valkyries tracked and added to the footage, and what were the biggest issues in mapping them into the filmed footage. In one scene, a Valkyrie pulls the talent out through a window. Please tell us how the animation for that scene was created?

Phil Dakin, Layout Artist

The CG Valkyries were added into the footage using the tracking software Boujou almost exclusively with some manual tracking done in Maya. Tracking for Max Payne was generally easier than other projects we've worked on because the CG demons rarely, if ever, touched the ground. When in contact with the ground or other objects in the plate, CG objects can slip if the track isn't accurate or the geometry isn't placed correctly in 3D space. It was actually the shots containing set extensions and matte paintings that demanded more tracking accuracy than the CG demons themselves. The overall dark, brooding style of the footage added an element of difficulty back into the tracking procedure. The dark sets meant that shutters were open longer so any camera move is sure to contain motion blur making it more difficult to track.

Many of the shots had changes in set lighting which can also throw off the tracking software, in particular the turntable shot of Max Payne as the drug vision sets in and the roof explodes outward to reveal a dramatic sky swarming with demons. Fortunately for this shot, illuminated tracking markers were placed around the set, without which tracking would have been much more difficult. Once we had a perfectly circular motion path for the camera, we knew it was correct since the real camera was on a circular rail.

For the shot with the talent being pulled through the window by the demon, the camera traveled along rails from the interior of Owen's apartment, through the wall and then outside to a large green screen in the studio. There were plenty of

contrasting objects inside the apartment set for the tracker to grab onto and the green screen was adequately marked when the camera emerged through the wall to the outside. When the camera path in Boujou appeared to be straight, we knew it was correct since it reflected what the actual camera was doing. Again, the track needed accuracy more for the set extension and background matte than for the demon. The demon's positioning was based entirely on the position of the talent's shoulders as he was being pulled out into space with its talons.

Mark Schreiber, Lead Animator

In approaching the animation of the Valkyries, we worked closely with the director, Mr. Moore, in preproduction to define their traits. Final animation was arrived at following a detailed process of refinement and elimination. Initially Mr. Moore envisioned quick, sharp and purposeful movements. As the show evolved and as we received the film plates in-house, a number of performance avenues were explored. In essence, the Valkyries movement was truly defined with the success and milestone achieved early on in production when Spin completed the "Owen's Death" sequence. Both the Fox Studio executives and Mr. Moore reacted very positively to the fluid movement of the Valkyrie pulling Owen out the gaping hole in the multi story building.

Spin also forged some of the CG backdrop elements to the movie. Can you describe how you created the CG city environment – from modeling to texturing and lighting?

Jeff Campbell, VFX Supervisor

Our approach to the CG city environments varied depending on the nature of the camera move in the particular plate. The more challenging shots, such as those found in the "Owen's death sequence," required a multilayer 3D build while others involved large scale, layered 2D mattes which were later used in Eyeon Fusion's 3D environment by our compositing department. Large, multilayer 3D mattes started off as concept paintings, which, after client approval, served as modeling, texturing and lighting guides. Once the camera tracking and scene setup was completed, the environment layers were laid-out either using finished models or stand in geometry.

Modeling was most intensive when it came to the detailed foreground elements of city sets where camera moves would pick up the convincing complexity of detail in the edges of buildings and props. The mid-ground models contained less detail and only the main shapes were blocked in while background structures were comprised of primary shapes or layered projection planes. The texturing process of the builds relied on camera projections and UV texturing using Autodesk Maya with cleanup being done using Maxon Bodypaint. Depending on the nature of the camera move and the number of layers, several projections would usually be set up with some projectors handling multiple images. This was

especially relevant in the case of background layers where detailed alpha masks defined building shapes. Following the concept art projection images were painted using photo reference in Adobe Photoshop and lighting information was for the most part included in the textures together with shadows and specular highlights. To speed up render times simple ambient shaders were used for most of the layers in the colour pass. A master lighting setup was usually done by the lighting department following the concept art for the purpose of rendering out extra passes such as specular, reflection and occlusion which were in the end combined with the colour pass by the compositing department. Extra layers were later added to lend more life to the environments including particle based snow, embers, steam and moving skies.

The transformation of the snow particles to embers looks great – can you please tell us IN DETAIL how this was handled, and also what software tools you used for the particles?

Tim Sibley, Lead FX TD

The snow was simulated as a Maya particle system, with the wind and drifting motion guided by Maya's turbulence and drag fields, as well as some MEL expressions to add variation to each particle's velocity. Maya's particle collision event editor was used to trigger the birth of the ember particles, upon collision with proxy geometry created to match the set and Mark Wahlberg's movement within the scene. MEL scripting of the particle's LifespanPP attribute were used to selectively transform the remaining snow particles into embers over the course of a few seconds. The particles were cached to a series of .pdb files (which carries a much smaller file size than the standard Maya .pdc), and the rendering was handled via MayaMan and Sitex Graphic's AIR, which is Renderman compliant. The snow was shaded via sprite images, and because of the monochromatic output, the RGB channels were each used to pass through additional depth information to assist in the compositing process. The embers were rendered via an AIR streak particle type, with procedural texturing to vary the look of each ember.

Spin was also responsible for the key hallucination scene, with a room being torn apart by fire. Can you please describe IN DETAIL how you tackled that scene? What rotoscoping work was required, and how did you create the ceiling effects?

The first stage of tackling this shot was to obtain a steady 3d track, which was not easy given the length of the shot, varying lighting conditions, and wide-angle lens that it was captured with. The plate for this shot had a large practical light in frame, to simulate the interactive light caused by the fiery sky later in the shot; which necessitated the creation of a CG ceiling even before the disintegration event occurs. The ceiling was modeled in Maya to match measurements taken

on set, with rendering handled via mental ray, using lighting that was carefully animated to match the changing illumination from the plate photography. The destruction effect was created by carefully pre-breaking the individual geometry elements of the ceiling tiles and framing, and then exporting that information into RealFlow as an .sd file. Realflow's rigid body simulator was used to tear the ceiling apart, with different sections of debris becoming active at different times, and a variety of vortex and turbulence forces driving the motion. Realflow was chosen over Maya's native Rigid Body solver due to its abilities to handle very large volumes of geometry while remaining stable, and allowing for the number of sub step iterations to be carefully controlled. The simulation, which went through several iterations, took about 10 hours to compute for the shot. This data was then re-imported as baked animation information into Maya, which allowed for additional keyframe-animated refinements to tweak the results of the sim.

Additional debris was created via a particle instancing system, and twisted wreckage was inserted along the edge of the ceiling cavity - this was modeled in Maya and then deformed via an Ncloth simulation to suggest movement caused by swirling winds.

The compositing process (which used Eyeon's Fusion) for the shot required a roto of Mark Wahlberg to allow for the CG ceiling/sky to be inserted behind him. Additionally, some complex keying work was used to help extract bright light beams from the plate photography that could then be overlaid on top of the 3d elements. The Valkyries were animated in Maya and rendered in Air, while the fiery sky was achieved via a projection of several layered flame and cloud elements. Some 2d elements were also inserted to sweeten the shot, including live action flames, and additional dust and smoke elements.

Which elements of the project proved the most challenging?

Jeff Campbell, VFX Supervisor

The wings were challenging to get the right look. It took some time to build a shader to get that sheen you see on bird's wings. Also with wings you need opacity passes in order to let light through the feathers, which tended to be render intensive. The specular on the body was also always tweaked. At first John Moore wanted a wet look but that made the skin look too plastic. We are able to have a lot of control over the spec. in compositing because we would have tight and wide passes from the Open EXR file to choose from. Our pipeline outputs the Open EXR file format, which contained 64 channels to allow us maximum control over every imaginable part of the Valkyrie in comp.

Finally, looking back at the project, what are you most proud of and what would you have done differently if you had the time and resources?

Jeff Campbell, VFX Supervisor

I am proud of the look and feel of our shots. They exude emotion, which is lacking in many CG shots today. I am also proud of the fact we did all this all in 15 weeks without sacrificing creativity. I would have loved to do more Valkyrie shots if we had more time. I guess its good to the leave the audience wanting more. Part 2 maybe?