image engine

VISUAL EFFECTS FOR FILM

THE THING

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"I want to congratulate and praise all the artists at Image Engine for all the incredible work they have done on *The Thing*. As being the prequel to John Carpenter's *The Thing* the bar was already extremely high and Image Engine pulled it off. Not only the end result but from the very early concept phase Image Engine gave me the freedom and the creative support which was so essential to make this film work. Thanks again and hopefully till the next movie."

- Matthijs van Heijningen

Image Engine Transform the Creatures and Environments for The Thing

Image Engine has provided over 500 visual effects shots for *The Thing* (2011), the prequel to John Carpenter's classic 1982 film of the same name. The prequel tells the story of the occupants of the Norwegian camp, who make the first fatal discovery of the alien space ship and creature, and ends where Carpenter's film begins.

Jesper Kjolsrud helmed the project as the production Visual Effects Supervisor alongside Steve Garrad, Visual Effects Executive Producer. They worked closely with Director Matthijs Van Heijningen, Producers Mark Abraham and Eric Newman, Visual Effects Producer Petra Holtorf and Universal Pictures to realize a new vision for the 2011 film.

Image Engine's contribution spanned over a year, from pre-planning, on-set supervision through to post-production with a crew of over 100. The majority of the work involved creating computer generated creature transformations and digital environments. In all, there were 167 100% computer generated creature shots.

CREATURES

On set, Kjolsrud helped to co-ordinate the efforts of multiple departments, including special effects, creature effects, visual effects, stunt performers and the wardrobe team to get the best photography possible in order to prepare for the digital builds.

During production, it became clear that the overwhelming majority of the creatures would need to be entirely computer generated in order to perform successful mutations and react to ongoing design changes. Planning for the creatures in Postvis throughout the duration of postproduction, the team worked closely with the director and editors to establish the look of shots created entirely in CG.

the thing

The creature transformations were overseen in post-production by Digital Effects Supervisor Neil Eskuri and Animation Supervisor Lyndon Barrois. There were six hero transformations in all, each mutating in entirely different ways, and requiring different creative and technical approaches. "The creature's monstrous form could be made up of any anatomy it's ever encountered before" said Kjolsrud. "We had to think beyond the challenge of animating a creature rig and figure out how to go from A, which would be the human form - to Z, which would be the monster, and all the steps in-between."

Because of the unconventional nature of their design, every creature in the film presented it's own unique animation challenges. Ken Steel, Lead Animator explained: "For example the Edvard Arm creature that sprouts legs and runs off had 4 short legs on the right side of it's body, 3 longer ones on its left side and a middle finger at the head that was meant to be used as a leg as well. While this made creating animation with realistic weight and balance a challenge, it also created an opportunity for us to explore how a creature like this might move in the real world and that, from an animation point of view is an ideal scenario."
The unusual creature designs had complex rigs, some of which included several hundred joints.

Building on Image Engine's proprietary asset management system, Jabuka, the rigging team developed a new modular system named 'Riglets'. Fred Chapman led the development of the system, which had to meet strict requirements for efficiency of build and playback of the animation puppet as well as exacting quality of output.

"By developing Riglets we could standardize the build of each module, so that every arm or hand or spine was built in a way that was consistent and stable without being constrained by how they connected to each other" explained Chapman. "We could attach a tentacle to a chest or a leg to a shoulder with a deformed hand on the other end. Riglets was invaluable in helping a small team to efficiently build and maintain the many creatures, digital doubles and props, during frequent design changes."

Other efficiencies included handling organic deformations such as muscle movement and skin sliding through procedural calculations to give artists more control and a faster pipeline, adding in subtle dynamics only at the very end of the process. (For more on this, read Renee Dunlop's 3D World article).

Image Engine's R&D team built the proprietary tools designed by the riggers including the spline IK system and multi-bone IK/FK joint system. They also developed a native skinning data format in Cortex (an open source library of tools for visual effects software development, led by Image Engine's lead programmer, John Haddon), which gave faster and more controllable manipulation and transferring of skin weight data. See more on Cortex here.

FX

The Thing represents the most challenging work to date for Image Engine's FX department. The team, led by Greg Massie, decided early on to commit to using Houdini for the project and spent a lot of time integrating it into to the pipeline. In the end there was a 70/30 split of effects between Houdini and Maya.

The creature work was split in to two; general FX such as blood, slime, drool, flaps of skin and then the hero transformations.

"The general creature FX was something that we were fairly familiar with from District 9. We used a lot of nCloth for gore, nParticles for doing simple slime and Houdini wire sims for all of the creatures' hair," explained Massie. "The transformations, however, were a big leap for us. Most of them were full frame and integrating with human characters shot in the plate."

Two of the most challenging were the Edvard/Adam face merge and the Sanders alien at the end of the film. "Edvard/Adam went through a huge number of iterations as we learned Houdini and learned how to integrate it in the pipeline." Massie said. "The director had some reference of a face being punched in slow motion that he wanted us to match to. This made using simulation very hard and in the end a large number of custom built deformers were used to push and pull the face around in very precise ways."

The FX elements for the Sanders alien face rip were completed in around 6 weeks. First a previs was put together to get accurate timings and to work out where the cuts would be. The initial sim for the skin was created using Maya's nCloth then the result sent back to Houdini to attach to the original mesh, build skin thickness and to do tech fixes ready for rendering. The blood elements were then completed using the FLIP solver in Houdini. According to Massie, this is where the decision to invest in Houdini began to pay off: "It was a testament to Houdini's rapid prototyping that allowed this shot to be completed so fast."

COMPOSITING

For the compositors, the mutations also represented significant creative challenges and the deployment of several different techniques. For example, one of the most complex shots was the Edvard/Adam transformation, which involves a facial merge between the live action plate of Adam, the CG Edvard head and projections onto a deformed mesh. The shot went through several design iterations, overseen by lead compositor Evelyne Leblond: "Because it's a human face it had to be really perfect, so we wanted to keep as much of the original plates of Adam as possible" says Leblond. "It was necessary to break out every component and channel into comp, which resulted in hundreds of layers."

Shots involving burning the creatures also involved the use of many different approaches to marry together practical, 3D and 2D elements. Kjolsrud had overseen the shooting of the plates, literally burning the puppets in order to establish the correct lighting on set and practical reference. However, once the CG creatures had been completed, the compositors had the task of translating the practical fire elements onto the new creature. "The FX guys made a base layer for fire and the compositors had to put in 2D fire to complete and enhance it. We literally used every technique we could think of to make this as seamless as possible."

DIGITAL ENVIRONMENTS

Whilst the creatures were the stars of the show, the film also required extensive digital environment work. Many of the exterior shots required digital background extensions to be married to the foreground practical set that was filmed in Toronto. This work also required computer generated ice/snow for many of the foreground shots under the actor's feet, as well as creating other CG assets and architectural elements including an 100% CG helicopter and Spryte.

"Two of the largest challenges were creating the ice cave with the spaceship and the environment within and around the Thule camp" according to Neil Eskuri, Digital Effects Supervisor. "Scale was always the issue. The spaceship was said to be 1000 feet in diameter, which meant the ice cave had to feel immense. The camp, a partial set created and shot in Toronto, had to be digitally extended and put into an environment which would make it feel small and vulnerable."

the thing

The FX team was also heavily involved in this area, and covered everything from the collapsing ice cave through to snow, snow and more snow! This was primarily achieved using POP networks in Houdini for the snow and RBD simulations for the breaking ice. A lot of time was spent integrating the output of these sims with our rendering pipeline, which is hosted in Maya and rendered in 3delight.

"Overall, the project involved the whole gamut of visual effects work" said Kjolsrud. "Kudos to the whole team at Image Engine, who really stepped up to the plate to deliver above and beyond what was required to live up to the 1982 Carpenter version."

"The Thing provided us with a great challenge and opportunity to showcase Image Engine's capacity to create stunning creature animation." said Visual Effects Executive Producer, Steve Garrad, "The advancements that were made to the company's proprietary tools and workflows throughout the show will help us to continue to raise the bar on future projects."

before & after

before & after

before & after

before & after

before & after

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The Thing - fxguidetv #123

To watch the podcast, click here.

jesper kjolsrud
vfx supervisor, image engine

Resurrecting The Thing

VFX WORLD, AWN.COM | Bill Desowitz | OCTOBER 18, 2011

The acclaimed John Carpenter monster movie gets a digital upgrade from Image Engine for the new prequel.

From the outset The Thing was intended to recreate as much of the look of John Carpenter's iconic version, but, at the same time, director Matthijs van Heijningen Jr. wanted to take advantage of the latest digital technology to push it further. Jesper Kjolsrud of Image Engine was the production Visual Effects Supervisor and he figured out the best approach to blend practical with CG methods.

"One of the first things that came up was that there was obviously going to be a lot of burning things," Kjolsrud says. "And Matthijs wanted real convincing fire, so the approach was very much to try and film as much as we could practically, and augment it to what we need to do in post. So with the fire, for example, you can create really nice looking flames now with fluid sims. But it's very hard to light the sims. But if you have real fire, you can get anything you ask for. So you have stunt men on fire running through the scene, and if we want to animate differently in the flames, we could use a mixture of elements and CG fire that dynamically behaves how we've animated it. But at the same time, we have a flame that is lit with a real fire and I think that was a very good approach."

But, of course, it's the new Thing that is the mainstay of this prequel to the 1982 Carpenter film. It was designed by ADI in homage to creature makeup designer Rob Bottin. However, there are some new twists. "There was a rethink when it came to shooting it because it wasn't symmetrical," Kjolsrud adds. "And our movie explains a lot of some of the little things they have

in Carpenter's movie, including this two-headed burned monster they find in the Norwegian camp that they take back to their camp to study. So they designed something that ties into that. The faces had to look kind of similar, but the limbs were never seen that well in Carpenter's movie so they went to town and have the limbs that stick out looking raw. We actually see how it becomes the two-headed creature and who the two faces are. It's a humanoid with normal skin up to a point. And because it's R-rated we could take more liberties when it's transforming and growing to make it really disgusting."

Obviously this was a far cry from Image Engine's crustacean alien from District 9. For that they had one creature with multiple versions. But the challenge here involved multiple creatures and a transformation but similarly done in Maya and rendered in 3delight. "And the transforming bit is really what we started looking at," Kjolsrud continues. "Right from the beginning we started to break things down into smaller and smaller bits, trying to figure out each of those smaller parts. And once we had the footage, we broke it down into shots as well. But, technically, we would throw anything at it, including cloth sims, even for skin. And for the transformations we would draw from human to almost an upside down spider with tentacles coming out of the chest.

"That became in terms of rigging, two very different things. We called them riglets. Rather than traditionally placing your joints and bones inside a piece of geometry, you could rebuild a whole rig with small tweaks. You'd go from one shot where a couple of legs grow out, which would have one specific rig for that shot. We would have to rig it slightly differently to keep the transformation going, but the end result was very much a traditional animated rig when it's full formed. And on top of that, for each shot we would go in and actually animate deformers going through an extra layer on top of the skin. So when something grows we'd have bubbles and bones popping out."

The customization, meanwhile, was done with Image Engine's open source graphics library called Cortex developed by John Haddon, which includes C++ code bound into Python and tied into Maya.

"For me, what was most important was to get as good a plate as possible and to film it as good as possible," Kjolsrud emphasizes. " I got involved with costumes and special effects and stunts and came up with plans for shooting as much realistically as possible. Pulling out cloth with little wires and things and trying to get as much in camera, even knowing that for it to work with animation we needed to do a cloth sim of that anyway. But at least you have something that works in the frame and it's lit really nicely."

Original article found here.

Shotgun on The Thing

Vancouver-based visual effects house Image Engine has been in high demand since its opening in 1995. With numerous Emmy, Gemini and Visual Effects Society (VES) nominations under its belt, Image Engine has built a notable roster of credits over the years including *The Twilight Saga: Eclipse* and *Breaking Dawn*, *2012*, *Watchmen*, *The Losers*, *The Thing* and most recently, *Immortals*. For their work on *District 9*, artists from Image Engine received Academy Award and BAFTA nominations as well as a VES win.

To ensure that they continue to deliver their trademark high-quality, cost-effective work, Image Engine constantly explores ways to improve its production process. Initially, the studio developed a proprietary system to streamline production management, but found that it didn't deliver the efficiency they needed and drained valuable R&D resources. Below is a brief view of the way Image Engine worked with the Shotgun Production Tracking software.

Jesper Kjolsrud was in charge for *The Thing* project as the production Visual Effects Supervisor alongside Steve Garrad, Visual Effects Executive Producer. Neil Escuri joined them as Digital Effects Supervisor. They worked closely with Director Matthijs Van Heijningen, Producers Mark Abraham and Eric Newman, Visual Effects Producer Petra Holtorf and Universal Pictures to realize a new vision for the 2011 film.

For production, of *The Thing*, Image Engine's contribution spanned over a year, from pre-planning, on-set supervision through to post-production with a crew of over 100. The majority of the work involved creating computer generated creature transformations and digital environments. In all, there were 167 100% computer generated creature shots. They were the main house on the film.

"We were growing and taking on larger film projects, and we knew we were going to need a database-driven production management software solution that would grow with us," said Shawn Walsh, Visual Effects Executive Producer and Company Partner. As the company approached work on *The Thing*, they began to investigate Shotgun, a flexible and scalable web-based project management system tailored for visual effects, CG feature animation and video games.

"We had a lot of desire to roll the knowledge from one completed project over to the next one starting up," said Walsh. "Shotgun allowed us to handle an increasingly complex workload. Also, when we looked at how far we could get internally in six months of development time and where we would be with Shotgun in the same time period, it was clear that we'd be where we wanted to be faster with Shotgun." The studio quickly brought Shotgun in house, and by the time production started on *The Thing*, it was a key component of the pipeline.

Information Organization

Shotgun gave the studio features and capabilities that enabled them to use common data across production operations. "The information is now maleable and formatable in a way that we can truly use it," said Image Engine Producer, Vera Zivny. "Shotgun provided a great hub for the massive amount information required in production and addresses the different needs of different users."

Each member of the production has specific informational needs, and Shotgun enabled them to extract only what is relevant to them and host that information in one location. Live updates ensure the information stays current automatically. Imagine Engine was able to make Shotgun work with their production management style without making any major adjustments to its pipeline.

Customization

Even though Shotgun is ready out of the box, it is highly customizable and can be tailored to suit specific client and project demands. Image Engine regularly collaborates with the team at Shotgun to continue to optimize their use of the Shotgun system. "The people at Shotgun have been great about working with us to improve our methods and achieve our goals," said Image Engine Facility-Wide Production Manager Rachel Scafe.

"The Shotgun API is really well designed. It's easy, logical, and very straightforward," said Image Engine Developer, Ross Kakuschke. "Our main operations are hooked into Shotgun through our in-house developed pipeline to make dailies, video outs, film outs and deliveries. We even integrated Shotgun with RV and Cinesync to customize our playback systems."

Image Engine also developed a Shotgun event daemon that queries the event logs and monitors events in Shotgun. Kakuschke explains, "Once tasks are completed, our Shotgun daemon will automatically assign a different status to that task. For example, when a matchmove task is complete, the program updates that shot to an animation task. Task emails are distributed as needed so the whole flow of information is automated and streamlined."

"Before we had to manually update the status of each task individually and there was a lot of separation between departments," notes Zivny. "With Shotgun, we can change the status of things on a large scale which saves a lot of time and prevents confusion."

Image Engine production coordinators previously unfamiliar with Shotgun have been particularly impressed by instant notifications and lack of restrictions. They are able to create their own customized pages and organize pertinent information however they prefer. Over the course of a production, the information important to a coordinator evolves so the interface flexibility is

extremely useful.

Simple Transition

Implementing a new production management system can be daunting, but the switch to Shotgun was seamless. Once artists were trained to extract information from the database on their own, Image Engine's transition to Shotgun was been a fairly smooth process,-- especially when compared to the transition to their proprietary production tracking system for District 9, which required a great deal of manual input and and linking across disparate databases.

"On that show we had several coordinators to schedule tasks and link everything together, often with the aid of their own separately maintained databases," said Zivny. "There was a lot of heavy communication between coordinators and between the coordinators and artists." With Shotgun, Image Engine can now input schedules and see how resources are allocated in a streamlined fashion, which reduces the risk of miscommunication. This feature is particularly critical in scheduling 'multi-purpose' artists who float between several teams. "Purchasing a solution that tracks most of what we do just made sense," Kakuschke said.

Overall Advantages

"With Shotgun, artists, developers and producers have a way to track everything they do in a central location accessible to everyone in the facility," said Kakuschke. "Efficient production relies on tracking shot production from beginning to end. Without Shotgun, I don't think we would have a way to do that."

Scafe added, added, "Centralizing live information has also upped the overall efficiency in the facility. Not only can notifications be sent automatically to the appropriate people, historical data can be used to backtrack shots if needed. Historical data can also help us predict shots on future projects and learn better practices."

Walsh noted that Shotgun's ability to manage multiple projects – each with their own challenges, while maintaining a level of overall pipeline coherency is to him, the software's biggest benefit to the studio. "There are about 150 people here who interface with Shotgun one way or another. From our artists to our financial folk, everyone is getting on board. That's probably more proof than anything else of Shotgun's success at Image Engine."

Original article found here.

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The Thing: Jesper Kjolsrud
VFX Supervisor - Image Engine

THE ART OF VFX | Vincent Frei | 2011

What is your background?

I got in to computer graphics through a university course in the north of Sweden. It was unique for using industry standard hardware and software, something that was very hard to get experience with at the time unless you already worked in a facility. That led to an animation job in Gothenburg and after a few months a position at MPC in London through one of the guest lecturers from the course, Paul Franklin. One of the first jobs I worked on was *The Borrowers*, which was supervised by Peter Chiang and when he a year and a half later approached some of us to set up a new facility to do his latest job *Pitch Black* I moved on to what became Double Negative. I stayed there for over 10 years until my family and I felt like a break from London, which ultimately led me to Image Engine in Vancouver.

How did Image Engine get involved on this show?

We got a call from the director, Matthijs (Van Heijningen), and the VFX producer Petra (Holtorf) towards the end of 2009. They had seen and liked our work on *District 9* and thought we'd be a good fit for the job.

What was the Director's approach to visual effects?

Matthijs is a very experienced commercials director who's done big projects with complicated VFX so having that knowledge we tried to fit the job around him. In commercials you tend to work with artists directly so we tried to do the same without bothering Matthijs with the processes and pipelines of a project of this scale.

What was the real size of the exterior set of the base?

The base itself was built as a 1:1 scale set based on the production design with only certain areas like the back of the building missing as it was never featured. It was built in a quarry in Toronto against a slope that would fit in to the geometry of the mountain location in BC.

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How did it feel to give your contribution to the great and scary creatures that Rob Bottin and John Carpenter created?

One of my favorite parts in Carpenter's version is when the severed head grows legs. I for one wanted to see more of that. And the gruesome double-headed monster the Americans find. The way it was lit and filmed worked great but it was dead. I would have loved to have seen it move. With the techniques of the early 80's that was extremely difficult to pull off but that's something we can do quite well today.

Was there a shot or a sequence that prevented you from sleep?

If there's one thing I've learned so far, you can't let work interfere with sleep. Sleep is far too nice for that.

What do you keep from this experience?

Although the project was a huge challenge I'm very pleased how well it turned out. There are always curve balls being thrown at you. All shows have their challenges but now I'm more confident than ever that we can handle it.

How long have you worked on this film?

I started prepping just before Christmas 2009 and we finished the show at the end of May this year so about a year and a half.

How many shots have you done?

We ended up doing around 550 shots.

What was the size of your team?

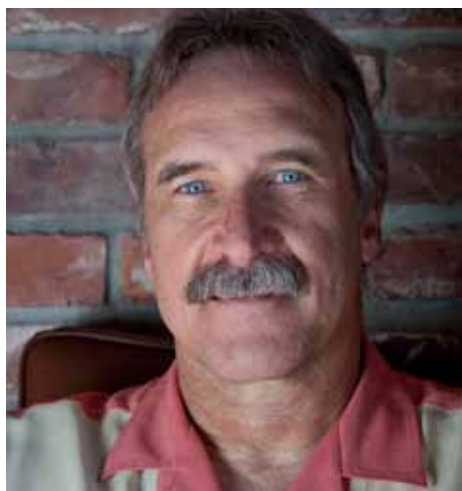I think we peaked at around 100 people.

What is your next project?

I'm currently working on another Universal project called *R.I.P.D.* It's another creature show so in a sense we're carrying on with what we were doing on *The Thing*.

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// Neil Eskuri – Digital Effects Supervisor

How was the collaboration with director Matthijs van Heijningen Jr.?

Collaboration with the Director was pretty good. Matthijs had a lot of great ideas and disgusting images that he would send us for the look of the different creatures. Their maw, or mouth, what he thought the feet and toe nails might be. The gruesome inside tentacles from swarming snakes and worms. He sent close-up shots of insect feet and bird feet along with nature footage of Cuttlefish and squid hunting their prey. He often said he wanted the creatures to be 'horrifically beautiful'.

How did you recreate the helicopter?

There was a 'shell' of a helicopter on set so we had good reference images from those shots. The only time we used the actual set copter was when it was on the ground and the interiors shots. Whenever it was flying, it was our model.

By photographing the actual model, we used those images to build and texture the CG model. Then the lighting was generated from HDRI images taken on set.

The look of the rotors went through several variations. Because of the rotational speed of the rotors and the shutter speed of the camera, the look can be different. Finding that right mix with motion blur took a lot of trial and error.

Can you tell us more about the impressive transformations shots and especially Juliette's?

Juliette's transformation was always a question mark because, although we knew what she was going to look like once she was fully transformed, how she got there was unknown. We had our concept artist, Juliana Kolakis, go through several different ideas and stages of how her chest would change. Matthijs constantly asked what we would see, how much of her human-ness remained? How much alien is pushing through the skin?

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A 'beat sheet' was created based on the cut, which would explain what would be seen in each shot. This changed as the cut changed. Matthijs then suggested that the alien should already be pushing through the chest before her sweater falls off.

Since tentacles are a big part of the alien look, this gave us the idea of a ball of snakes trying to push through the skin, which is what you see in the first shot. Then as the teeth of the alien mouth rip the skin, we see the inside tentacles push through while Juliette's head is forced towards her back. Her proportions constantly made it difficult for animation since we now had this huge mouth and claw on her thin legs, how was she going to move and look powerful? Like most things, a lot of trial and error and versions were made to bring her to life.

Can you tell us more about the huge ice cavern and the spaceship?

The spaceship was to be 1000 ft. in diameter and over 60 ft. high. A good portion was buried and covered in ice and snow so you wouldn't see it all, but still have an idea of how huge it was. After we got the original model, certain design elements had to change once shots were being laid out to convey the vast size of the ship and the cave and still keep the framing Matthijs wanted for the shots.

Since the actors were shot on small mock-ups of the ship, when the designs began to change we quickly knew that very little, if any, of the set pieces could be utilized in the shots. We only kept the very edge of the ship and the hatch from the original photography.

Like most elements, the Ice Cave went through a lot of different versions. There were several meetings to discuss how long the cave had been there, the evolution of the cave over the centuries, if ice columns had been created from the ceiling to the ship, and a schematic was created to show the types of ice and snow in different areas of the cave. Again, armed with hundreds of images of different types of ice caverns, several concept art pieces were created to give the sense of a vast expansive ice cave and sub-caves housing the alien spaceship. It was probably the most difficult look to achieve.

Was there a shot or a sequence that prevented you from sleep?

They all kept me awake at night. Often, I'd wake up at 2 in the morning with some part of the project on my mind. Each had their own trials and tribulations, but the louvre sequence to blowing up the alien was the part that kept me awake the most.

Those sequences came at the end of production with very few weeks left. We still didn't have the final designs for the ice cave or the spaceship and the Sanders alien was going through a complete overhaul. We knew it was going to be a tough finish, but with the talent of the crew and the flexibility of the Image Engine pipeline, we were able to deliver.

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// Fred Chapman – Lead Character Technical Director

Can you tell us more about the design of the creatures?

The initial creature designs were provided to us from production. These designs go through several stages of approval before they reach us but it is still possible for us to suggest tweaks.

Most creature designers work mainly on aesthetics, they want to design something that looks cool and original, however what works for a static design won't always work when it starts moving. We need to imagine what's going on under the skin, where are the muscles, bones, tendons, how are the joints structured to give the range of motion required and also convey sufficient strength. In order to convey a sense of realism in a creature it needs to appear to interact with real world forces so each body part needs to appear to be able to withstand the stresses it would be under were it really moving in that environment. For example we requested bulkier muscles in the front limbs and stronger looking shoulder joints for the Edvard-Adam Thing so it would more able to support the mass of the torso, trying to keep the essence of the design and add just enough reality to make it work in the scene.

Once we've modeled, rigged and animated a creature then the clients will get to see it move for the first time, that's when the next round of design tweak requests start, these requested changes can sometimes go right through to the week of final delivery. At least one of the creatures was totally unrecognizable by the end of the show compared to what they had in mind on the day they shot the sequence.

How did it feel to give your contribution to the great and scary creatures that Rob Bottin and John Carpenter created?

The creature effects in the 1982 film were amazing for their time; I've always been a huge fan. It's such a great honor and challenge to be involved in creating the modern equivalent and I'm really proud of what we achieved. Audiences are much less forgiving now than they were in the 80s so the approach used then would simply not have worked this time around. That said, we were very conscious of remaining faithful to the style and character of the creatures in John Carpenters film so I really hope that shows in our work.

Clients no longer have to accept that whatever they get in camera on the day of the shoot is the final version they're forced to use in the film. They now have the option to come to us afterwards and describe what they really want or how they'd like to take it further. As long as the time and resources are available we can keep working on it until we achieve the result they're happy with. That's why in the final release of the film there are almost no practical creatures visible. I take it as a back-handed compliment when I read reviews saying the CG creatures were not as good as the practical ones because I know the ones they thought were practical were ours too.

Can you tell us more about their creation and the challenges to achieve them?

There are a number of huge challenges we faced on this show. The visceral, organic nature of the creatures is always a difficult look to re-create. From a rigging point of view we work from the inside out, even though you never see it the viewer has to get the sense that there is a complex internal anatomy to the creature. We don't have the time or resources to try and recreate all of that underlying anatomy so much of what we do is about understanding the complexity and trying to mimic it as efficiently and simply as we can.

The rigging for those creatures should have been difficult. Can you tell us more about it?

For me the trick to rigging for VFX is about keeping the node graph as clean as possible. However good your initial planning, things will always change so you need to keep the rigs adaptable right through the show. There are 3 main ways we achieved this, by making use of custom nodes to keep the number of nodes and connections low, using a modular rigging system for consistency across each asset and not requiring too much from any single rig. Most things we need to do in rigging can be achieved using existing nodes and a bit of ingenuity in how to use them. To create complex behavior often requires the layering up of one bit of rigging on top of another to create the final solution. This is both inefficient computationally and messy when you need to debug something not working right or make requested changes. In these cases I like to think about the data flow, what are the inputs an animator needs to have control over and what are the final outcomes that the rig needs to achieve. Then I work out the most efficient calculation to get from A to B and we create a single node to process this calculation.

Our modular rigging system, named "riglets" allows us to position pivots and controls in a template and connect up a rig from its component parts, a torso, clavicle, arm, hand, etc. As soon as we have a stable solution for how we want a body part to behave, we make it a riglet and the riggers should never have to think about that again, freeing them up to spend more time on making the deformations look better. It also allows us to mix and match body parts, so we can put a tentacle coming out of a chest or an alien foot on the end of an arm, etc. A general rule I like to work to is to build rigs which are capable of doing around 70-80% of what the asset needs to do. It's very common when you start building a rig to think about the extremes of what will be required and to try and to factor everything into a single solution. This can result in an overly complex and slow rig. I prefer to look at what are the core things a rig has to do in ever shot and build the rig to do that. If in a single shot it needs to do something different then we treat that as a special case and may build a custom rig asset or just fix it in the shot.

The most critical thing about any rig is how the animator feels about using it. Ultimately rigs are just tools for the animators which puts the rigger in the role of servicing the requirements of the animators. We need to strike the right balance between speed and detail, sometimes having different levels of detail of the same rig for use at different stages in the shot development. Its a constant challenge to stay one step ahead of what they may require and ensure that they are able to achieve what they need to as smoothly and efficiently as we can.

Can you tell us more about the impressive transformations shots and especially Juliette's?

There is no set process to achieving the transformations, each one was handled as a one-off and in most cases required a number of different effects to be layered up to create the final shot. It was also an iterative process in narrowing down what the clients wanted. Initially we're given quite a vague concept like "these two heads merge together" or "the skin on her chest rips open to reveal a giant mouth". Exactly how we achieve that depends on the very specific details. Does it happen fast or slow? Does it start at the top and work down, or in the middle and work out? What happens to the extra skin? Does it shrink back, fall off, dissolve away? Until we've answered all these questions we don't know for certain which parts we'll do in rigging, animation, cloth, fx or comp. These transformation shots are often the most collaborative between the different disciplines, each having to adapt to what works best for the others.

How did you create the terrifying arm that attacks one of the characters?

The arm creatures were actually some of the easiest rigs to build and maintain. They're good examples of why a modular rigging system was a good approach for this show. Through the show the redesigns meant the number of legs changed, human fingers were merged together and the mouth areas changed significantly. Each time we could easily go back to our modular template, make some adjustments and rebuild. One of the reasons these rigs were so simple was due to the proprietary multi-bone ik and spline ik nodes we created. Compared to standard out-of-the-box solutions these nodes have so many more features for controlling the exact behavior of each bone and shaping of the leg. For example in a segmented 5-bone leg the animators can control the weighting of each bone to adjust how much automatic movement goes into each bone with additional animated override. It also took care of IK/FK blending. All of the control values feed into a single node which outputs transform values directly into a single joint chain. This single proprietary node gives complete control and flexibility with the absolute minimum number of nodes and connections. The same is true for our IK spline tool, which gives us a huge amount of extra control over twisting, aiming and scaling of joints along the chain. We had a multi-bone setup for each leg and the claws around the mouth and our ik splines for the spine, mouth sphincters and muscles. That's pretty much the whole rig.

press

What do you keep from this experience?

That I'm so lucky to be working on awesome films, for an awesome company, with some awesome colleagues. Image Engine is small enough that we can really be responsive to a client's needs, we can make bold decisions and be really creative and efficient. At the same time we're big enough that we have some world-class talent, especially in the RnD team who work closely with the artists to create tools and pipelines that enable us to create top quality work. We developed some great tools and techniques on *The Thing* that we will definitely be using again but we're not complacent, there's always plenty of room for improvement.

Original article found here.

Additional Press

Shifting Shapes: 3DWorld CHRISTMAS 2011

VES Award Nomination

The Thing
Outstanding Animated Character in a Live Action Feature Motion Picture

About Image Engine

Whatever the scope or size of the production, from pre-visualization through to handling complete feature films, we provide scalable resources, and a wealth of experience and talent.

Developing robust production pipelines and pioneering in the area of proprietary software development, Image Engine is fast becoming a leader of innovation in development for visual effects.

History

Image Engine was formed in 1995 in anticipation of the growing strength of the postproduction market in Vancouver.

The founding partners (Greg Holmes, Robin Hackl and Christopher Mossman) began with a simple vision to produce stunning work for the demanding producers and directors who were increasingly flocking to Vancouver as a location for high-end visual effects.

With numerous Emmy, Gemini and Visual Effects Society nominations under its belt, Image Engine went on to seize the growing opportunities in feature film visual effects work.

The success of the film division led to its architects Peter Muyzers and Shawn Walsh being made partners in the business. They remain a driving force building Image Engine into an industry leading feature film visual effects facility, culminating in 2010 with the Academy Award® nomination for *District 9*.

From its first production *Slither* through to the recent high profile productions including *District 9, 2012*, *The Twilight Saga: Eclipse*, *Breaking Dawn*, *The Thing*, *Immortals*, *Safe House* and *Battleship*, Image Engine has built up a notable roster of credits.

Image Engine is based in Vancouver, BC, North America's third largest film production centre - and is in the same time zone as Los Angeles.

International Talent

Our skilled teams are integral to our success. The first-rate supervisors, programmers and artists at Image Engine bring their global expertise, boundless creativity and a shared passion for producing spectacular visual effects to every production – whilst our teams of highly experienced production staff run a seamless operation to ensure that every production is delivered on time and on budget.

Image Engine currently employs individuals who hail from Australia, Austria, Belgium, Brazil, Canada, China, England, France, Germany, Hungary, Iceland, India, Ireland, Italy, Japan, Mexico, Myanmar, Netherlands, Philippines, Poland, Russia, Scotland, Slovakia, South Africa, Spain, Sweden, Taiwan, and The United States. The diversity of our crew's backgrounds is paramount in the success of our film projects as we constantly try to see with new eyes. The studio is truly a place where creatively gifted and technically skillful people from all over the world have collected to achieve great results together.

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VISUAL EFFECTS FOR FILM

Credits

Battleship
Universal Pictures 77 Shots – Creature Animation, Effects Animation & Compositing

Safe House
Universal Pictures 378 Shots – Crowds, Hard Surface Animation, Matte Painting & Compositing

The Twilight Saga: Breaking Dawn
Summit Entertainment Inc. 60 Shots – Creature Animation, Digital Doubles, Effects Animation, Matte Painting & Compositing

The Thing
Universal Pictures 550 Shots – Creature Animation, Effects Animation, Matte Painting & Compositing

Immortals
Relativity Media 130 Shots – Digital Environments, Matte Painting & Compositing

The Twilight Saga: Eclipse
Summit Entertainment Inc. 389 Shots – Creature Animation, Effects Animation, Matte Painting & Compositing

The Losers
Dark Castle Entertainment & Warner Bros. Pictures 147 Shots – Hard Surface Animation, Effects Animation, Matte Painting & Compositing

The Factory
Dark Castle Entertainment & Warner Bros. Pictures 217 Shots – Matte Painting, Effects Animation & Compositing

Law Abiding Citizen
The Film Department & Overture Films 85 Shots – Effects Animation, Matte Painting & Compositing

District 9
WingNut Films & Sony Pictures Entertainment 311 Shots – Character Animation, Effects Animation & Compositing

Orphan
Dark Castle Entertainment & Warner Bros. Pictures 124 Shots – Effects Animation, Matte Painting & Compositing

The Incredible Hulk
Marvel Entertainment & Universal Pictures 75 Shots – 3D Animation, Matte Painting & Compositing

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VISUAL EFFECTS FOR FILM

SERVICES

Character/Creature Animation
Character/Creature Design
Compositing
Digital Doubles
Digital Environments
Digital Matte Painting
Look Development and Concept Artwork
On-Set Visual Effects Supervision
Post-Production Visual Effects Supervision
Postvis
Physical Effects and Simulation
Previs

To request a project quote or to obtain more information about our services please contact:

Shawn Walsh, Visual Effects Executive Producer
Studio: 1.604.874.5634 | **Mobile:** 1.604.377.4144
shawn@image-engine.com

Steve Garrad, Visual Effects Executive Producer
Studio: 1.604.874.5634 | **Mobile:** 1.604 317 7590
steveg@image-engine.com

IMAGE ENGINE

15 West 5th Avenue, Vancouver, British Columbia Canada, V5Y 1H4
Phone: 1.604.874.5634 | Fax: 1.604.708.8433
www.image-engine.com