EDITORIAL

After many months of hard work, we are extremely happy to see our first publication materialize. Working at 3DTotal for the last few years has involved editing and producing content on our monitors only, so this printed hardback collection of artwork and artists' techniques is a wonderful item for the community to enjoy and the contributing artists to put their names to. The imagery alone is a wondrous benchmark of what today's artistic talent can achieve using this digital medium but Digital Art Masters is more than a gallery book. The artists reveal their working processes behind each image, making this book an informative and educational record behind some of the world's finest digital art. We hope that each time you view the book whether casually glancing across the final renders or studying the wealth of detail and informative techniques on offer, it continues to prove to be a superb learning tool and source of inspiration. Read on and enjoy!

Tom Greenway
3DTotal Founder and Editor

SPECIAL THANKS

At the top of this list are of course the 48 contributing artists to this book. It's their fantastic creations and their willingness to share their working techniques and tips with the rest of the digital art community that have made this publication possible. The visitors to 3DTotal.com must also be mentioned here. Your returning commitment, support and feedback drives the site, community and 3DTotal team ever forward.

EDITED & PRODUCED
BY THE 3DTOTAL TEAM

Tom Greenway  Chris Perrins  Richard Tilbury  Ben Barnes
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Little Friends
by Ronnie Olsthoorn

Concept
“Little Friends” was made on commission for a friend of two World War II pilots. He wanted to surprise the pilots by presenting them with realistic artwork of their personal wartime aircraft, named “Hubert” and “Satan’s Lady.” Both pilots flew their P-51D Mustangs on the long escort missions from their bases in England to the heart of Germany and back. In reality the veterans never flew together on these missions, but since they have been friends for over 60 years, their aircraft are portrayed in formation flight. The name of the artwork, “Little Friends” comes from the nickname the relatively small escort fighters got from the bomber crews.

Research
With a realistic artwork like this, a lot of research is required. Since the artwork was meant as a surprise, the veterans couldn’t be consulted. Luckily some decent wartime photographs were available of their aircraft, which helped me to accurately recreate them. However, while doing research I discovered that one of the aircraft, Satan’s Lady, actually crashed in autumn 1944 (killing another pilot, who was flying it at that point), while my reference material for the other aircraft depicted it as it was in 1945. Since the planes never flew together anyway, I decided to ignore this chronological inaccuracy, as I was sure the veterans wouldn’t mind.
Modelling

Scans of scale drawings of the P-51D Mustang were mapped onto a box with inverted normals, to provide an accurate template for me to work from. I started modelling (1) the air frame by extruding a cylinder from the nose down to the tail, adjusting the cross-sections as I went. Next holes were cut for the wings (2), which were then given an aerofoil shape and extruded outwards. This was all down at a low polycount, after which the mesh was subdivided in the usual manner. After subdivision detail was added, cockpit windows were cut out and flight control surfaces were separated from the wings. Since both aircraft were slightly different in their configuration, certain parts (such as the rear-view mirror) had to be separated so they would only be used on the appropriate aircraft. Two sets of drop tanks were modelled, although in the end only one type was used.

Texturing & Materials

I went a bit overboard on the texturing. Since I wanted as high a detail textures as Photoshop could handle on my computer, I made different textures for just about every part. For example, top, bottom, left and right textures for the fuselage, top, bottom and front textures for the wings and horizontal tail plane. I made colour (3), bump (4) and specular (5) variants of each texture map. Although I achieved my goal of having high-detail textures, the sheer amount of different texture files I had to work with made the process of tweaking the materials really tedious and I will not use such an approach again in the future!

Using the specular map as a mask, I applied Raytraced reflections to the materials to achieve a nice metallic look, as apart from the markings these aircraft were not painted. I created a sky dome by making a tile-able sky texture and applying it to a sphere with inverted normals. This gave the aircraft skin something to reflect. In the end this worked out really well, and especially the reflection in the drop tanks gives the illusion the planes are in the air, flying high above the clouds. To achieve a weathered and realistic look, different multi-colour procedural noise materials were created for each plane. These procedural materials were rendered to texture to ensure a seamless appearance (6). Other weathering effects were painted by hand, such as exhaust stains and paint chips. The nose art on both aircraft was hand-drawn in Photoshop as well.
Lighting & Rendering

After numerous tests, a composition was found that would show both aircraft from a pleasing angle, accentuating the nose art (7). Several backgrounds and light setups were tested, and I settled with a warm, early morning setting (8). Lighting setup consisted of a single directional light with Raytraced shadows to act as sunlight. Next ambient light was imitated by creating a dome of lights using my E-Light MAXScript. These lights cast soft shadows and act as fake Global Illumination. A low-contrast version of the sky dome texture was used to colour the lights. This helped in merging the aircraft models into the background. As mentioned before, a textured, inverted sphere was used for the reflections, which added to the light. The propellers were replaced with a row of simple alpha-textured planes, which saved a lot of time compared to motion blurring the propellers.

Before the aircraft models were rendered, I had to create the bomber contrails behind them. I went out with my digital camera to photograph contrails of overflying aircraft. I created several contrail textures by stitching together the digital photos. These were then mapped on simple 3D planes and rendered against a sky background. The resulting render was used as the background for rendering the aircraft. The render was split up in several stages to increase the overall render time. For example the double-layered cockpit glass and the pilot and cockpit interior were hidden for most of the render. Also once the rear plane was rendered it was hidden, as its reflection wouldn't be visible on the front plane. All rendered bits were later composed in Photoshop.

Post production

Once the raw render was assembled, it underwent a lot of editing in Photoshop to become the final image. This included tweaking the colours, adjusting brightness and contrast, adding grain, motion blur and effects. There was no time to model the B-17 bombers for the background, so I edited an airshow photo to match the light and colour of the render. The 3D pilot model of the front-most plane underwent extensive plastic surgery. Another high-resolution airshow photo of a pilot was edited and overlayed to match the 3D pilot. Light and shadow effects were added to blend him into the render. Next I painted out the face of the pilot until it was a pink blob. Then an actual wartime black & white photograph of the veteran pilot was taken and edited into the pink blob to give the pilot in the artwork a completely new face, resembling that of the real pilot.

Portfolio examples
Hot and Dusty
By Niels Sinke

Concept
This piece is entitled “Hot and Dusty” as it should represent a very hot day at Black Rock Desert in the USA. Whilst swimming one day, I remembered the time when I had the chance to experience land sailing and since then I have always wanted to make my own land yacht and where better to start than in 3D. I did not make any concept sketches (which I only occasionally do) but started to look at references of the real deal on the internet and then make a rough representation in 3D with minimal shapes and forms (1) to make a composition and get some idea of scale.

Modelling
The modelling process was fairly simple, as I wanted to composite the sailing car into a background rather than modelling the complete background in 3D. This left me with only the sailing car itself. From the initial model I began to refine it and replace parts. After about 5 to 6 hours the model was completed. After which I made some early tests to see if the composition was good enough with the current model. Almost all modelling was done with poly modelling and primitives (2), except for the sail where I used splines so that I could slightly add a curve to the sail to imply there was wind blowing in it.
Texturing
The texturing is the part which I like best. In this case I used Vray for rendering which also has its own materials, and really brings the art to a new level. First of all I started to texture the different parts like the body (3), (4), tyres and sail (5). The sail was the most interesting part, as I had to design my own sail since I could not find any useful references for that.

Since I am a windsurfer I know the sails are almost the same in design. So I searched for speed windsurfing sails and found a very nice one, which I made fit on the sail texture I got from my sail in 3D Studio Max. I added my own design to it in Photoshop and concluded the sail.

Compositing
This part was quite important, as I had to make a background where the sail car could fit in. It had to be right with multiple perspectives and also give the feel I wanted. I searched for several hours to find numerous images but did not find one with the colours and feel I wanted so I made a matte painting from a couple of images which are on the right (6), (7) and ended up with the bottom image (8).

Then I loaded the bitmap into the 3D Studio Max viewport and made one very big plane, which served as a ground object. Then I could place a camera and start trying out different angles to get the back plate to work in the composition. This is not too difficult, as I only had to get a plane to match with the ground of the back plate.

Last but not least was to make the plane a matte shadow object so that it would receive shadows but not show the plane itself.
Lighting
Lighting was done with a single spot with Vray shadows and I had to match it with the back plate but since there were no objects on the ground in the back plate I had a lot of possibilities so I just chose one.

The fact that I can use one spot is that the Global Illumination renderer of Vray would calculate the rest of the lighting (9).

Post production
I always render at a resolution around 3000 to 4500 pixels for print reason, but I was not happy with the final 3D Studio Max render and so used Photoshop to add several colour correction layers and to alter the brightness intensity (10). I also painted dust from the sail car by hand with a wacom tablet, which was the first time for me, and I really liked working with it. Glows and other highlights were added until I was satisfied with the results and this was repeated for all four images (11).

Eventually I added motion blur in Photoshop as this was way faster than rendering the motion blur and this way I had more control over it.

Well I think that was a quick insight into my project and I hope you understand the process a little more now.

Portfolio examples
The Guide
by Donald Phan

Concept
With this project, I wanted to incorporate some 3D elements and photographic textures. The bridge and lantern were modelled and rendered in Maya, the rest was digitally painted or overlayed with photographic textures. I started the project by creating several concept drawings (1).
Below are some of the Photoshop techniques I rely upon. Adjustment layers are a powerful tool allowing you to modify areas of your image at any time and they work on specific layers. I created a hue/saturation adjustment layer for the bridge (1) and, with the colourize option checked, adjusted it to match the proper lighting. The colourize option can be effective in monochromatic palettes like this.

By using clipping groups, you don't need to create masks in order to specify what areas the adjustment layers will affect. Clipping groups can be used if you want to have a layer's transparency determined by the pixel information on the layer beneath it. Any modification to the original layer will result in a modification in the clipped layer. Holding down the Alt key and moving your cursor between the two layers you would like to group will turn the cursor into two overlapping circles.

Using layer masks instead of erasing out certain parts of the image is useful because it can be edited at any time. On the girl's layer, I created a layer mask and filled it with the render clouds filter. I then gaussian blurred the clouds to reduce the obviousness of the filter. Control clicking a layer allows you to easily select the layer's contents (and Shift + Control clicking other layers will add to the selection). You can control click layers to get rough selections as a starting point for you to edit your masks.

Blending modes can be a little intimidating at first, but with experimentation, you will see how they can be used to create quick and easy effects. I've found it useful when looking for ways to add detail or to make certain areas pop out to duplicate these layers and change their blending modes. For the girl's highlights (2), I duplicated her a few times and set those layers to the linear dodge and colour dodge blending modes (and lowering their opacities when necessary). I never really imagined the hard mix mode to ever be useful for me, but it gave the wood texture a paint peeling effect, which was really appropriate for the scene. For the sky, I imported a personal photograph and modified it with a slight twirl filter (3). I experimented a little by duplicating it and setting the duplicate layers to different dodge, lighten, and screen blending modes. It gave an interesting stormy feel, which added a lot to the piece's atmosphere.
The tree-lines were created from a custom brush made from a photograph. To prevent the trees from looking like cut outs, I erased into them using the same custom brush set to varying opacities to soften their edges and make them look more natural (4). For the bridge’s wood appearance, I could achieve variations of the same texture with the transform tool (5). Part of the beauty with working digitally is that your canvas size is never set in stone. I tend to work a little larger than I think the final crop will be, and use areas of black to temporarily create a visual crop.

I used a lot of adjustment layers with layer masks to control areas I wanted to edit, and was able to produce quick lighting effects with blending modes. I could texture an entire object using just one texture with the transform tool. As with many programs, there are a lot of ways to accomplish the same task, but it's useful to experiment with different techniques to see what works best within your workflow. These are a few of the techniques I've found useful, and I hope you will too.

Portfolio examples
A Day in Valcour
by Nicolas Richelet

Concept
With this image I tried to represent the entrance door of a very old mansion located in the Ardeche country, near the city of Pont-Saint-Esprit, France. I spent several days there and I found the atmosphere very quiet and inspiring. So I tried to convey the same feeling through this image, and include some things that don’t exist on the original scene to add more interest, like the old bicycle, the ivy and the encrusted heart with letters. The challenge was to suggest things to the viewer, but not too much, to let him imagine a story behind the scene.

Reference
This aspect was very important, as I tried to represent an already existing scene. I had to take some large close up photos to have reference mainly for modelling and texturing and used some of these photos to create the textures (1, 2, 3 and 4).
Modelling
Modelling was mainly done using extrusions on a plane (5). I had to bevel all the sharp angles to add realism (6). For the wall, the bevelling was done after unwrapping the UVW's in order, to simplify the process. Reproducing the big cracks on the wall was easy to do with the use of the Vray displacement modifier and the appropriate displacement map (7). The ivy was simply made of softly rounded little planes with an opacity map for each one to create the leaves which were placed on the wall with the use of the new 3D Studio Max 6 particle flow system.
Texturing
The maps used in this scene were mainly painted and cloned from the photos with Photoshop. I’ve used a UVW screenshot to help me paint in some particular things like cracks, some mould, a little bit of rust, and so on (8). The wall texture is a combination of a diffuse map, a bump map to add grain and a displacement map to carve out some big cracks. The ivy is just made from an ivy leaf photo for the diffuse channel, an opacity map for creating the leaf shape and maps for the reflections and glossiness to show the leaves reacting to light.

Rendering
Rendering was made with the Vray rendering engine, with Global Illumination On with low settings for the irradiance map. I have chosen to render the image with the “catnull-rom” anti-aliasing filter that sharpens the rendered picture. Adaptive QMC sampling was used instead of the adaptive subdivision method because of the big amount of bump and displacement mapping.

Post production
I have used Photoshop for the final touches: I added a brown colour on some leaves to add variety in the ivy, and some dirt on the scooter. I have also used photo improvement tools to correct contrast, luminosity, and so on. My favourite final effect is given by the blur and sharpen filters: the conjunction of these two add a dreamy effect that perfectly suited with the atmosphere I wanted for the final image.

Portfolio examples
Hagia Sophia
by Juan J Gonzalez

Concept
The idea to make this piece came from an old drawing of Hagia Sophia published in a book. I wanted to make an image using my imagination, far from my normal technical work, so I didn't use any other photographic or technical references. All modelling, layout and rendering has been made using Lightwave 7.5 without any special plugins. Textures and final compositing were done with Photoshop 6.0.
Modelling
To model the scene (1) I divided the building into small pieces made at an arbitrary scale (2, 3), because no technical references were used. I think of large scenes as a group of small pieces. I use basic modelling tools, a lot of boolean operations, bevels, and so on. I wanted to add a lot of detail to improve the realism of the image. The key to this is irregularity, and booleans to imperfections to wall edges and jitter all small components of every part of the model. I also avoid seams by adding small displacements to all repeat elements like windows and so on.

Texturing
Perhaps being the most important feature of the project, I textured each part individually (4). I don’t use any kind of procedurals, only image texture maps. Usually I use some kind of stone texture base, from my own photograph libraries, then add layers of dirt, humidity spots, etc, and using photographed noise as an alpha channel to help connect them. The second phase of texturing is to add horizontal dirt around all hard edges. I use gradients from distance to pivot point to add these layers, up to 10 layers in some cases. Then I add other small details using noise image maps with alpha channels in each position where needed, like all the humidity noise in windows, edges, etc. I use bump, diffuse and specular maps too, to add an old and irregular aspect ... perhaps three or four layers in the final stage (5).
Lighting

Finally I load the scene into Lightwave and then position and scale the individual parts of the building to match the reference drawing. I added some dark trees and other small vegetation and stones (6) to increase the detail of the final image. The final scene has about 1.700K polygons and 200 individual objects.

Direct lighting comes from one yellowish area light source that simulates sun from the right. Ambient lighting comes from a sphere mapped with a sunset photograph (7). Only minor point lights are used to add some detail in certain areas, but the effect is nearly unnoticeable.

Rendering and Compositing

Final image at print resolution (3600x2248) was rendered using the default Lightwave renderer. To solve the plain aspect of the building and background I rendered a separate pass with a volumetric lighting solution. Finally I compose these and fine tune them in Photoshop retouching the final image and volumetric contrast.

Portfolio examples
The man without body
by Marcel Baumann

Concept
I created this scene for a personal 3D-animation project "The Last Connection". The room in the picture is a ticket room between an underground car park and an outdoor area which is connected by two elevators. I decided to model it separately from the other 3D scenes to get a better overview. My goal for this 3D scene was to create a realistic environment with basic modelling, standard lights and to get a short render time of maximum 3 minutes per image (800x430). I made this scene in August 2002 and improved it a few times before I rendered it for the animation in May 2004.
First I drew some basic pencil sketches so that I knew what I had to model (1).

**Modelling**
The modelling for the main room is very basic, just a few boxes with smoothed edges with as few faces as possible. I added some objects like the elevator doors, the bench, advertising panels, a vending machine, ventilation grills and four pillars as well as some other stuff.

**Texturing**
I made some screen grabs and painted a texture over them in Photoshop. For the textures I used existing photographs, blended them together and mixed them with hand drawn elements like mud and shadows. I used the print screen to see where the corners and edges of the other objects were so that I could draw the dirt and scratches on the wall at the right places. So to summarise, I created a single texture for each wall and mapped them over the geometry. What I also needed was a bump map, especially for the bricks which can be seen on the plastered wall (2). The same was done for the floor but I also created a reflective material to add transparency and reflection, and give it a mysterious depth (3). For the ceiling I just used a repeatable concrete texture and added a low polygon noise displacement to it, so the shadow doesn't look flat. I tried to make textures that give the feeling of an abandoned ticket room. To help working on the details I opened a new file and modelled them there, because I had a better overview and could import them more easily into other 3D scenes, such as the ventilation, rubbish bin, lamps etc. I imported the main file and positioned them in the right places. Afterwards I spent time working on the most important part, the lighting.

**Lighting**
There was no possibility of using radiosity because of the render time, so I used mostly standard Omni lights to create a mysterious mood. I tried many set-ups but after much experimenting I settled for one lamp in the whole scene over the bench with the man without body (4). I added five Omni lights in one row under the lamp to get diffuse light and shadows. On the other side of the room I added three Omni lights that lighten the scene a bit in dark blue (5). These blue lights are in the final picture coming from the right and make the scene a bit weird. The viewer should feel that there is something more in this room, something he can’t see. I placed the main light over the man that brings him into the safe illuminated area of the room.
The idea of the man without body is, that the viewer isn’t aware of him right away. But after the second or third viewing, the man becomes more apparent. As you may notice, the body of this person is invisible. Only his clothes are visible and the area where his head should be is covered by the front pillar. I added some more standard lights behind the walls, ground and ceiling to create the illusion of reflective light, making a total of 15 lights in this scene. For most lights I used far attenuation to make the gradient of the bright and dark part of the main lighting harder. It looks like the pool of light is caught in the darkness and the light is not powerful enough to illuminate the whole room. I used only standard shadow maps with lower quality to save a lot of render time. The viewer won’t notice this and I don’t think that the quality of the shadow maps will affect the quality of the final picture dramatically. I also used low resolution textures for the animation, because it’s unnecessary to use very high textures for a picture with a resolution of 800 x 430 if you don’t show close-ups of details. There are other aspects of the picture that are more important than the resolution of a texture, like composition, storytelling and mood. After this I rendered the final picture and adjusted the colours and contrast and finally painted some glow over the bright parts, to create a cool and uncomfortable atmosphere.

Portfolio examples
Sad Street
by Cetin Tuker

Concept
Though I am working in the animation industry, I am an architect and I really like experiencing architectural spaces. My favourite architectural spaces are human scaled, softly lit, old architecture. I do not enjoy the feeling of cold steel and glass. So, though I worked with architectural visualisation for about 8 years, I didn’t really enjoy the job and I decided to model the architecture in my mind, which I think was the correct choice.

The first stage was finding out a good subject on which I wanted to work. The primary idea for this image came from a photograph that I had seen a number of years prior. That photograph included an arch and a door facing it. I thought the contrast between the slightly shaded atmosphere of the area covered by the arch and the well lit area in front of it, including the old wooden door, would be a subject matter to catch the eye and the smooth shadows and slight blue colour that comes from a cloudy sky and would add a silent and calm atmosphere to the composition. All the other elements are carefully placed in the scene to bring out rich shadows and depth.

I did not draw any sketches by hand for this work, but I did do 2 or 3 mock-ups utilizing 3D Studio Max. Those were useful developing the modelling technique and lighting.
Modelling
I used real life dimensions in centimeters. I started with a very simple but quite large box which was about 10x10x10 meters. Then I "carved" the volumes in it. That's not the usual method for architectural modelling, but it worked well for this image. Using nearly 10 meter high walls helped me to attain the reflected soft light over them. My model was very simple in the beginning, but parallel with the development of the process, it became complicated. I detached the surfaces that I would work with and started working on them in detail. For the walls, I used a noise modifier to give them a rough geometry. I then added cracks and holes to them. I always chamfered the corners 2 or 3 times to break the unnaturally perfect look. For the doors, I did almost the same thing. All the corners of the doors are chamfered to rid them of sharpness. For the floor (1) and the right wall, I went further. I detached those surfaces, subdivided them, painted a specific texture to use as a displacement map, and then collapsed the modifier stack and retouched some corners vertex by vertex to get perfected joints between the wall and floor. I wasn't satisfied with only a "bump" map (2) because the shadows that a bump map can produce are very weak. My goal was to get real shadows from real stones.

All other objects: pots, lamps, postbox etc. were modified by hand as described above, to get rid of the unnaturally perfect look (3). The modelling process took more than 40 hours. I modelled the floor at least 3 times. I didn't finish the modelling process until I was satisfied with the result.

Texturing
The texturing process was the hardest part, but it was also lots of fun. I wrote a story for all the walls. They got wet and dried many times. Some parts of them are very old, some parts had been repaired many times. Other parts are in need of repairing (4, 5). The family who lives behind these walls is not rich, but neither are they poor. Actually, they are simply an average Mediterranean family. It is also possible that this village is close to the sea. I am not entirely certain myself. This is the scenario of the life in this street, so I dreamed about the walls of this street.

I have a huge collection of photographs in my archive. Before starting a project like this, I survey a lot of the details of my project. In this case, I made a study of the walls. While painting textures, I started with a very new, but small wall photograph, then I developed it by painting
by hand and copying textures onto this image, and finally I applied cracks and some other dirt into the texture. I take photographs all the time and I have a collection of dirt maps of my own. Also I have some dirt maps that I have found from the net.

The hardest part of the texturing process was the floor. The main texture of the floor was a photograph. First, I rendered the "grey model" of my floor plan, then in my photo editing software. I carefully rearranged the stones so that none of the stones are cut prematurely by the walls (6). Then I cloned this floor texture and transformed it into a "grey scale" image. I selected all of the stone outlines and made them lighter. After this, I selected the mortar to place between them and made it darker. Thus, my displacement map was completed. I then cloned the original floor texture and generated another grey scale image for use in the bump mapping. The whole process took about 15 hours.

**Lighting**

The main lighting system is an HDRI image filled with shadow mapped Omni lights that are used where needed (7). I did not work a lot on the lighting. I always work on lighting in the beginning of the project before texturing. Texturing tends to hide the important shade and shadow balance, so I place lights when my model is almost finished. Then I continue texturing after lighting set-up is done.

**Portfolio examples**
Coney Island
by Meny Hilsenrad

Concept
In this picture I didn’t use any complicated modelling techniques or any special and detailed texture work like I have done in some of my other work. Instead, the challenge in the creation of this scene was developing the composition and achieving the atmosphere as I pictured it in my head.

Background
The first time I came across Coney Island was when I saw the movie ‘Requiem for a dream’. The city appears throughout all of the movie and has a great effect on the atmosphere of the story. I started to get interested with this place and the story behind Coney Island caught my attention. In the 1950’s this area was very popular and drew a lot of people to it. The place was full of life, but these days things have changed and the place became lonesome and abandoned. I found it very interesting to create the greyish environment which repeats a lot in my other pictures.

I added a yellowish tint to the picture which is supposed to be a reference to the 1950’s because I wanted the whole scene to feel like the posters and the colours of that period, making a connection to the time when Coney Island was popular.

Modelling
My goal in this picture was to convey a gloomy, apocalyptic kind of atmosphere, realistic quality and yet, done in an illustrative style. I tried to create lots of detail that will add interest to the scene. Things like the buildings in the background, the cart and dirt on the pier (1). I also dedicated a lot of time to creating the textures and lighting in order to reach a unique kind of look.

First of all, I take the time to set up the composition. I started building and designing the composition by creating cubes and setting them up in the space. These cubes represent the main models that will be replaced by them later on. I did lots of tests, moving the objects,
changing the camera angle. It’s very important for me to do this setup and plan the composition ahead, before proceeding with anything else. For this process replaces the need of making a concept sketch. When I was satisfied with the composition, I began creating the models and adding their fine detail. After making good progress with the models, I started work on the texture, shading and lighting process. This is a method that I use in almost all of my artwork.

**Texturing**
The texturing wasn’t that complicated because I didn’t focus on main objects but an overall look from a far point of view. I painted the textures in a very greyish manner. I almost always add a layer of some kind of dirt to push realism. Where unless something is really polished, almost everything in nature is covered with some layer of dirt. You can see that on the texture of the big wheel (2) or of the far building for example (3), which includes the initial layer and on top of it a layer of rust or dirt.

**Lighting**
The lighting of the scene (1) is quite simple and includes the main light which represent the sun on a gloomy day and also some fill lights. Rendering the scene is done by using Global Illumination.

Setting up the lights in the scene involved great time and care and a lot of testing which starting almost from the beginning of the scenes creation. I tend to do things this way because I like to shape and design the final look of the scene from an early point. Doing things this way I tend not to deviate from the path.

**Portfolio examples**
Night and Day
by Rob Adams

Concept
Above you see a drawing that uses spherical perspective to take in a more than 180° view. Also we can look up at the mountains and down into the canals. Day turns to night and there is hardly a straight line to be found. This drawing grew out of an interest in spherical perspective. As a concept artist I am often faced with the problem that the client wants a very wide angle view. Traditional straight line perspective unfortunately falls apart if the
angle of view is too wide. There are computer programs such as Stitcher that warp repeated photos into a complete 360° panorama, but I wanted a guide that I could use to draw over in an intuitive way. So I decided to create a curved perspective grid to act as a guide for laying out drawings. First I rendered a gridded floor using Maya and animated the camera 5° per frame, 9 frames and that was enough as 45° and makes a repeat. Here’s a few of them stitched together in Photoshop; as you see all the original straight lines of the grid are now curved (1). Repeats of this can be joined together to take in a full 360°. My next problem was that perspective occurs up and down as well. A complete spherical perspective grid has no less than six vanishing points. Four as you rotate East, South, West and North, one Up and one Down. The grid you see if repeated accounts for the four cardinal vanishing points. I then rotated copies 90° to supply the other two vanishing points. Here we meet a difficulty in that you cannot flatten a sphere into a rectangle! With
a little stretching however the problems only occur over our head and under our feet. Here are the two grids overlayed (2). This section covers 90° horizontal and 70° vertical. I join two of these together and add a bit each end giving me a panoramic view of about 200°. You could of course add as many extra sections as you wish, even going beyond the four that the real world needs. This would be the equivalent of spinning around and ending up in another world entirely! But I have a different surreal twist in mind.

You can see that the grid has allowed me to work quite freely using the lines as a guide as to how the perspective should flow (3 & 4). The grid I keep on a separate Photoshop layer on top set to darken, this allows me to turn it on and off as needed. Once the first sketch is done I fade it back and use another layer to refine the line work. I am aiming for a hand drawn feel so I keep everything freehand. Once the architecture is fully
established then the grid can be dispensed with. Here is part of the finished line work (5). I move the line work to a top layer and start painting on a layer beneath using flat brushes. I try to use as few tones as possible and also not to go too dark too quickly. I have decided at this point to have one side of the picture day and the other night, so I have set my light source to the left. From here on it's a case of working slowly over it bringing the picture forward bit by bit. It is important for me to keep the whole image on the go and not let any one part get too far ahead of any other. After the whole image had reached a certain point I duplicated the whole paint layer 3 times and roughly adjusted them to each time of day using the curves, colour balance and hue saturation controls (6). Once this was done I made a layer mask for each and made them dissolve seamlessly together. Next I merged the layers and began painting again by hand refining and adding detail until finished.
All in the Wind
by Li Suli

Modelling
For the locomotive I used a simple cylinder which I converted to an editable poly. Then it was modified through sub-object selections (extruding faces, moving vertexes, cutting, and so on). I used a max script and MshTools, to promote efficiency in my project. The chimney and sand domes were created directly on the body of the firebox, and the final model was shaped smoothly using subdivisions. Other components, such as the smoke box door, smoke-guiding boards, rockers,
wheels and so on, were added to the locomotive in relevant positions. Because there were so many parts needed, the modelling required much patience. The cabin and tender were created individually too. When all the parts were in position, I checked and optimized them carefully for a good balance of appearance and structure. Finally the whole locomotive was composed of 1022 objects and 72120 faces. I placed it in a classification yard, and placed a model of a turntable near the camera in the scene. The total number of faces in the final scene was 241280.

Texturing
To create high quality procedural shaders in this project, I chose DarkTree Textures (1). The most convenient aspects of procedural shaders were the superior render details that cater for any output sizes and true 3D volumetric textures which freed me from the problems with tiling and mapping seams. By using SimbiontMAX plugins for 3D Studio Max, I was able to load Darktree description files and recreate them in 3D Studio Max. With procedural texturing there were three ways I used to handle it in my project. The first is using the Darktree shader completely, which is probably the most important and powerful component in DarkTree. It's a program that combines surface information like surface colour, glossiness, Metal Highlight and Anisotropy/Anisotropic Direction, etc. So I used only a Darktree shader in this project, and it was assigned to the model of the smoke box door which was an anchor object in the scene. The second, the greater part of the surfaces was assigned by Brazil Advanced Material and DarkTree Textures in SimbiontMAX Map. I felt this was the most efficient. Based on RSL, Brazil shaders has provided me with enough selection and more. The third, I generated bitmaps by using Darktree's Bitmap Renderer. Then I painted and edited them in Photoshop to fit particular object surfaces, just like scratches on the body of firebox (2). But all of them in the upper was not the whole aspects in my texturing. There were also two important roles: HighlightOnly Material and Falloff map. As a max plugin from Blur Studio, HighlightOnly Material worked with Shellac Material added extra high light level to surfaces alone. An obvious sample in this project was the material of wheels. A large number of Falloff maps which based on objects' local axis or viewing direction were used to enhance contrast of materials. They got the half-shiny metal look and metal gloss was more realistic.
Lighting

As mentioned in the upper context, Brazil r/s was used for the final render. To get the output image, the Min/Max Samples in Image Sampling Control was 1/3. In this project, I set-up the scene without any key light source configuration. Because I hoped to portray a sad, atmospheric mood in cloudy and windy weather, I just used skylight to light all objects. But Brazil skylight couldn’t light specular areas on metal surfaces, so there were an extra 17 3D Studio Max standard lights in the scene. All of them were set to highlight specular only and the Diffuse option was disabled. Working with the Highlight Only Material and Falloff map, the additional lights, shaded around the locomotive and turntable to make them stand out (3). The atmospheric F/X including smoke, steam and fog were in independent 3D Studio Max files with independent lighting configurations.

Post-processing

I used Afterburn to create the realistic atmosphere which needed to be integrated into the original rendered image. This last step was finished in Photoshop. By using alpha channels, I took not only Afterburn smoke but also Afterburn fog to transparent layers (4). I had adjusted and edited each of them so that the final image became an organic whole. Finally, I want to thank my parents for their persistent support and to Jon A. Bell because I had a wish to become a 3D artist taking a first glance at his book in 1998.
Modelling

The first stage of creating the scene was to make a plane with a number of subdivisions that would form the rockface itself. It was then a case of applying a noise modifier to break up the symmetry and give me a starting point to begin moulding the surface into some sort of final shape. At this point I wasn’t sure where the details would be placed, I was only concerned with creating a surface that had a sufficient amount of variation and undulation to the eye and appear more interesting when lit. Once I was happy with the overall shape of the rockface I then started to model the doorways and the statue. I then placed a camera in the scene and decided on a final view for the finished render. For a still such as this I find it is good practice to set up the camera early on and then you have a clearer idea about which areas need more attention and detail with regard to texturing and geometry.
For example, parts of the rockface and statue that are hidden from the camera view did not require mapping. When all these elements were made I then placed them in the scene and positioned them in a composition that looked satisfactory in the camera view. The next step was to integrate these components into the scene in a way that suggested they had been carved from the rock itself (1). This was achieved by basically cutting into the plane and creating extra divisions and then lining up the verts in certain areas. By keeping the doorways and statue as separate elements it made it possible to apply a tessellate modifier to the rockface to add more detail but maintain the manner in which this articulated with the architecture and thus help convey the notion of man made features hewn from the rockface (1).

**Lighting**
With the lighting (2) I decided not to use any Global illumination as I wanted to have more control over where the shadows were cast and which parts of the scene received differing degrees of light which I felt would contribute towards a more atmospheric mood. To achieve this I set up numerous Omni lights, which would illuminate certain objects only and selected only a few to cast shadows. No clever tricks here just a case of manually moving them around and playing with the parameters until it looked right really. I included a volumetric light above the statue to help highlight it as a focal point in the composition and also added some fog to give the scene a greater sense of depth and scale.

**Texturing**
The texturing was probably the most difficult aspect of the project mainly due to the scale of the scene (3). Because of the large scale and the proximity of the camera to the near rockface it meant that the foreground textures had to be of a high enough resolution to appear detailed. It was not really feasible to use a tileable texture, as this would look far less convincing and destroy any variation in the surface. As it was difficult to find a single image of a suitable size and scale to map to a large area of the rockface it meant gathering a number of images and cutting and pasting the useable areas into a single texture (4). The obvious seams then had to be blended and modified so as to create a consistent surface and a believable image of a large area of rock which could then be mapped to as large a selection of faces as possible. I found it very helpful to texture and light the scene at the same time as it gave me a clearer idea of how well the various textures worked in different parts of the
scene. For example, the textures in the background are of a deliberately larger scale to help convey the sense of distance from the camera together with emphasizing the perspective.
Modelling
The main approach was to reach all the little details on the temple with displacement and bump map combinations, therefore I did not spend time modelling the cracks on the walls, or mortars holes between bricks. I used simple forms, almost standard primitives, shaped everything from polygons (1) and right before rendering, I converted them to Pixar Subdivision format. Early on, during the modelling stage, I set up the camera for the scene. As I had not done sketches before modelling, I had to play around with different camera settings, camera and key light positions to find the proper composition and the mood I wished to achieve. This helped me to have a clear picture of my final goal early on and then I could concentrate only on the visible parts of the scene which also helped me to emphasise different parts of the image with more or less detail.

Texturing
I mostly used the 3DTotal Texture Series CDs 1-3 for texturing the church, although I heavily modified them to get the desired result. I will show two examples of the wall textures in detail: The first one is the overall reddish, huge brick stone texture which was used for the main walls of the church (2). I started with a sandstone map and used it as a base (3), removing the unwanted bits in Photoshop whilst meanwhile trying to keep it uniform. I inverted a stained dirt map and used it to put some white washed out patches into the texture. I have combined a couple of photos to shape the bricks and form the mortars and finished the texture by adding even more dirt and dust layers. I had to create similar textures for each wall piece, but I paid attention not to use the same patterns and dirt layers every time. That would have been the big give away of this computer generated image, because there are absolutely no two dirt or washed stain patterns in nature, that are the same.

One of the trickiest wall pieces was the pebble style front cover around the windows (4). First, I mixed two
pebble textures together to get the base of the colour variations of the surface (5). Then I desaturated and adjusted the levels and contrast values of the result. I found an almost perfect pattern to shape the mortars, but unfortunately the brick patterns were a bit big and wide for my taste so I scaled them down and repeated the pattern all over the surface. Finally, I inverted and multiplied them together to get the dark, deep mortars between the bricks (6). An important step in achieving a believable surface is to have proper displacement and bump maps. Luckily the bump maps on the CD were well modified in the first place, therefore I could just redo the aforementioned steps to get the displacement maps (7). I have created specular maps (8) and some other different displacement maps in the same way so that I could layer above each other in the shade.

**Lighting and Rendering**

I tried to avoid using any kind of Global Illumination approach. Mainly because I wanted to have more control over the image and as the lighting is one of the most important parts of the creative process, I really like to have all the flexibility to adjust every aspect of the light and shadow in the picture. Using Global Illumination lighting has a kind of limitation on what you can or cannot do with the image, and in some cases, could cause long rendering hours. I would advise people to first try the more flexible approach, of using example key-light rig with a dome light rig based ambient occlusion.

My light rig is based on the traditional 3 point lighting approach: I used key-fill light mixture as the main light rig and I have also used a dome-light rig to generate an ambient occlusion map and add more reality to the image. First I created an orange yellow colour main key light acting as the Sun. As the position of the Sun is crucial in this case, I paid great attention to the forms and positions of the shadows cast. This is typically that kind of mood and light condition, where the composition could benefit from the contrast between the light and dark areas which add dynamism to the image.

I created a few blue colour fill lights to soften and brighten up the shaded areas and created a dome-light rig from 64 lights where 48 were acting as skylight, and the rest (16 lights) were the ground lights intended to simulate the bouncing lights from the ground plane. I have rendered out an ambient occlusion render pass based only on the dome lights and used it as a mask in the composite. In this way I had more control over the shaded parts of the image. I could darken/colour-correct specific parts, a good example of which is where the main walls are connected to each other and therefore less light could bounce into these areas. Finally, I rendered out an ID pass (9), to be able to separate the objects during compositing.
Ambient Occlusion
A few years ago, in 2002, a paper was published on the Siggraph by technical directors of Industrial Light and Magic about a lighting technique called ambient occlusion (10). This lighting approach is widely used by most of the VFX houses nowadays to achieve a photo realistic look. The whole idea is based on the fact that the amount of ambient light reading different surfaces is not equal. It could be way different and depends on the position of the surface point in the environment. For example, more ambient light is hitting the top of a car than the bottom, and this amount is even less if we check the area where the tyres meet the ground. On the church image, the amount of ambient light reaching the top of the roof is obviously more than the light reaching the wall right under the little arch. These amounts of the ambient light are actually independent from the main key light. So, if we could render out a pass, where the ratio of the

ambient light is visible, we could have more control over those areas in composite (11). There are a couple of ways to gain an ambient occlusion render. We could use Raytracing approach, or probably go for a faster, dome light rig based solution. In this second case we should create quite a few lights around our scene, in equal distance from the centre. (GI_Joe script for Maya) 64 or in some cases 32 spotlights could be enough to have a nice result. The size of this dome should be a lot bigger than the objects in our scene and obviously none of the visible and renderable objects should be out of the dome. We should keep the intensity of the lights low and the shadow blurred. As we would like to gain as much information about ambient light amount as we can, the ambient occlusion map should be detailed and be neither too bright (burnt out) nor too dark. We do not need any other lights in the scene (Sun, fill lights) and the only shader component to affect the surface of the objects in the scene is the displacement.

Portfolio examples
The Haunted House
by Daniele Montella

Concept
"The Haunted House" was developed after an eventful period from which I wished to express the idea of an eerie house. I began a matte painting in my free time about a bewitched house which I unfortunately never had the time to finish. Then whilst online I found a forum site dedicated to matte painting and I had the idea to open a challenge entitled "The Haunted Mansion". In the mean time Halloween was approaching, the best time to begin a scary painting. Matte painting always fascinated me since reading the Art of Star Wars books and particularly Ralph McQuarrie's illustrations and the pictures of the set before and after the application of the extension set. With the help of digital today it is possible to enrich the atmosphere of the sequence even more. I think that the collage of different pictures with their constant and improved editing is the best method; results are excellent and the method saves time.

I started with the main pictures the principal one defining the subject of the image and tried to find the best method to improve it. My intention was to express anxiety, isolation, the frustration that you feel during a horror movie in the classic situation such as a group of friends in front of the "house" who say "look at that house: it is haunted, let's go check it out!" and you are on your seat thinking "idiot guys! What are you doing; please come back!". The research for the main details of the haunted
house were simple: dry and twisted trees, a cloudy dark sky which created the worst feeling of isolation and different types of gravestones. I had only to attach some branches to the biggest tree starting from a sketch and later developing it with precise definition.

Composition
I began to study and develop the image after I had cut the photos. To compose my collage I used the style of "Regola dei Terzi" its use in photography is to divide the space of the image into 9 identical pieces with a grid making sure the centre is not the focal point for the eye (1). In reality the eye focuses more or less at the intersection point of the grid. I inserted the part of the house I was more interested in between two intersections at the right side of the shot, trying to avoid placing any important detail on the intersection line. I then divided the picture and created 4 different planes to give the sense of depth. The close up is on the twisted tree on the left side of the image which occupies a large part of the picture and helps frame the centre of the composition (2). The next closest item is the tree on the right along with the gravestones along the bottom edge. The aim was to create a sort of dizziness in an anti-clockwise direction with the house set just off-centre.

Tone and Colour
Dealing with a building that appears to be neglected and infested by ghosts, prompted me to decide on a greenish yellow tone. In general this colour is associated with dirt and illness; it is the skin colour of corpses, of rot, of urine and other repulsive things everybody knows like mucus etc. It was perfect for the terrible atmosphere I wanted to give to my work. I adjusted the images by 50% on the different layers and the contrast hue with the tune curve to obtain a different and weak light similar to the brightness of a raining day (3). Then I recovered a bit of colour unbalancing the remaining hue to the green and yellow with a bit of cornflower. After this I had the first total view of my composition and I began to paint in the missing details and adjust the existing ones, which proved the most complex and most time-consuming part of my work. Starting from the house I repainted the parts covered by the green curtain including the stairs, with the help of the clone tool. Then I began to "ruin it" trying to give it a sense of natural weathering over the course of time. So I stained the house using burn tool and then dug real holes into the wall and roof where I painted in the rotten and destroyed wooden boards. Same thing for the projecting parts like the veranda and some sections
of the roof, blackening them and painting them, trying to
give the effect of a broken roof taking the colour directly
from the image. All of the house suffered an easy and
meticulous work of demolition and I then added climbing
and muddy plants (4). After the difficult and hard work on
the house I moved to the forest. I found an image of the
dirty trees and I reproduced it until I obtained forest bush
behind the house, but realized it was too flat without
depth. So with a grey colour and a thin brush I started
to paint some evidence of trunks with a light coloured
brush alongside the different grey tones. I did the same
thing with the plants, bushes and herbs. Then using the
cloning tool I took a tone from the original bark and started
to add more definition to the branches! I used the same
approach for the gravestones and then painted in some
shadows on the ground (5).

Portfolio examples
Abandoned Place
by Laurent Ménabé

Concept
The starting point of my image was a series of photographs of industrial waste land taken by Henk van Rensbergen. The idea was to play with the lights in order to release a contemplative atmosphere which can cause the melancholy, the memory of the old things. The character in the background reinforces this feeling. He is present in the scene and seems to remember this place such as it was before. Maybe it's his old place of work?

Modelling
The modelling is very simple and does not raise really a difficulty. A very detailed attention however is paid to the roof so that the light can pass through (1). The vegetation is made with the module paint effect of Maya then transformed into polygon to be able to be rendered by Mental Ray.

Texturing
I spent great time and attention on the textures to get them right. I created them from personal photographs and some textures from the Total Textures CD volume 2 from 3DTotal. For the left wall for example, I used a repetitive texture in high resolution to which I added some dirt (with screen mode of Photoshop) as well as tags (2).
Lighting
The light is the most important element to this scene. I used two techniques and two rendering engines and then composited everything in Photoshop. On one side rendering in Global Illumination and final gathering under Mental Ray for the principal light source and on the other side rendering with the Maya software's engine for volumetric lighting. I also added some spotlights to emphasize a little more certain details of the image (3).

Rendering
I chose the render pass technique in order to have a greater freedom of compositing.
3 principal render pass:
Global Illumination and Final Gathering pass (4)
Volumetric pass (5)
Occlusion pass (6).
Seahorse
By Mariska Vos

Concept
Seahorses are so cute, I just had to model one. I’ve always liked them, because they look so small and fragile, and that the man gives birth to the kids is something that fascinates me as well, haha. There are a lot of different seahorses, that didn’t make my research any easier. Searching the internet for books I found lots of pictures, but always of different subspecies of seahorses. I decided to use several photos and make this seahorse. I cannot show these pictures here, because they are probably copyrighted.

Modelling
I always use subsurface poly modelling to create organic models. I model in squares, but always have the meshmooth on top of the stack in 3D Studio Max to see the final result immediately. First I counted the trunk rings and made a box that I divided in the right amount of trunk rings. When I was modelling I had to keep counting the trunk rings, because I had to make sure I had the right amount in the tail, body and neck. The belly for example starts on trunk ring 7 an ends on 12 (1).
I used a deform lattice to make the body shape, to make the right parts thicker and thinner. I didn’t make the curl in the tail yet. To curl the tail I used a bend deformer. The modelling of the base was the easy part. Now I had to extrude all the protrusions from the body. Extra edges were needed to make squares in the place I was going to extrude the protrusions from. I selected all the squares and extruded those at the same time, to make sure they were all the same. I extruded several times to get a nice shape. After that I changed them all a bit, to make it more natural. Now only some fins were needed and the body was done. I made those very thin, again extruded from the body.

The head was the hardest part to make. Especially because I didn’t have very good reference. Again I started with a very simple shape. Adding a lot of edges the head was created. The eyes of a seahorse look big but are very small. You can see the eyeball very clearly but it is covered with a dark colored skin. The actual eye is hard to see. The leaves were also modelled using subsurface poly modelling (2).

**Texturing**

Mainly procedural textures were used for the texturing of the seahorse. The spots around the eyes and the little particles floating around and the background are handmade textures (3). I wanted the eye to have more detail that’s why I needed the separated texture. The body is made from a combination of procedural textures. I used procedurals like the splat and the clouds to get a combination of small and large spots all over the body.

Choosing the right textures for the body took a long time. You can see some large white spots that give the model a more natural look and lots of dark small spots to add detail. I tried out a different combination of procedural textures until I found the one I wanted. Then I tried out different colours and sizes of spots.

After I had finished the texture I still thought the seahorse looked a bit plastic. It was looking too flat, I wanted it to look more like skin. To do this a bump map was used to add some extra detail to the texture. You can see it between the ridges on the body. It is made from a stretched noise map. The leaf texture is a procedural texture from 3D Studio Max.
Rendering and Lighting

I didn’t use any Global Illumination because it made the whole seahorse translucent. That’s why I used only three spotlights in this scene. I moved them around until I was satisfied with the effect they had on the seahorse. This took a lot of time, because the translucency made the rendering time very long. I used a spotlight in order to have very precise control over the lighting.

Portfolio examples
Mazda 787B
by d’Ettorre Olivier-Thomas

Modelling
The first part of modelling this scene was to make the car as real as possible. I started by using a rectangular spline, converting it to an editable poly and, by clicking and dragging edges, obtained the side of the car. Then, I made the 3D volume, dragging edges from the side to the centre of the car, and adjusting vertices to match the blueprint. The main problem with the car was making all the air vents, including the front part and the air grid on the top of the front and rear wheels. For that, I detached the polygons and worked in half the number of polys and then applied a meshsmooth modifier set to 1 or 2 and then converted back into an editable poly and collapsed.
the stack. The modelling now became much easier. To fit the air vent into the main frame, just use insert polygons from the editable poly menu, and extrude and adjust the vertices. Just working on one side of the car is best, as you can use symmetry modifier to create the whole car.

For the finished scene, I had to put all the detail in the mesh, so all the modelled parts of the car such as wheels and tyres. The front and rear rims are different too (1), so to make the model look real, I modelled them separately, in order that they did not match. It's the same process for the aerfoils, they are not symmetrical, because of the left position of the driver (Japan car).

When the modelling was finished, I applied a meshsmooth set at 2 for all the pieces. Then it just needed me to make some miscellaneous parts like the antenna and clips and the driver, modelled in situ, with the steering wheel in his hand. The main onboard part isn't needed for the scene because of the cam position, and the poly-count is better without. Don't forget by putting the car in situ too, the weight of the car is very important in order to look convincing in reality. Put the front of the car lower than the back, and turn the front wheels with the steering wheel. Don't forget also to make the external side of the curve lower than the internal side. That's all for the set up of the mesh and the camera (2).

**Texturing**

For the texturing, I used a multi UVW modifier on a single ID, using a composite material in the diffuse slot of the shader. Using a part of the unwrapping, from a planar UVW map, and exporting the wireframe from 3D Studio Max to Photoshop, the texture is now easier to make as they are all planar mapped, and all sponsors and details can be applied using a new UVW channel on the same ID polygon.

The main texture of the car (3) was made with Photoimpact, and didn't use anything other than the pen tool to make the shapes, and the line tool to make the discontinued white line. The resolution of the picture is very large, 2048x1024, in order to allow me to map the whole car with just this texture.

Sponsors' pictures aren't good enough (jpg compression, resolution...) so, I had to scan them (or download them) and use a vectorial tool to make the letter and logo the best I could. It is very useful to make this because now,
you have 512x512 pictures and the alpha channel of each of the sponsors you want. I made a dirt trace on the front of the car and also on the side, just behind the wheels (4). For that, I made a new UVW channel for the whole car, applying a UVW planar map across the whole car, adjusting it to contain most of the surface in front of the camera. Then, just export the mapping into Photoshop, and make the dirt mask with wet brushes in greyscale. For the shader set-up, just use a blend material; the main slot being the car paint (3), and the second slot with the dirt material (4), as a dark Raytrace without reflection and use a falloff as a blending mask.

The car paint is simply a shellac material in the main slot with a Raytrace material, fresnel falloff reflection and high specular and the second is a standard material which is very glossy (5). All others are Raytraced materials, with less gloss and specular, and reflection adjustment.

**Lighting**

First of all I had to match the picture intended for the scene, and place one main projector with Raytrace shadows, with no projection. I used the Global Illumination of Brazil renderer too, but with a very slow rate because I put three more specular omnis in the scene.

I used HDRi with RGB correction, all slot in grey to make the reflection in greyscale on the environment slot. For the headlight of the car, I used omni lights, one for Global Optical Illumination, and the other to highlight the road.
Post Production

I use the motion blur of 3D Studio Max on the wheels, using effect panel. I just simulated the road moving under the car by keyframing the wheels and road, keeping the car at the same place. The blur effect on the car was added in Photoshop, it's simply a directed motion blur (6). I didn't use 3D environment for the car, it's a picture from the web, I adjusted the cam following the vanishing point for the high and the roll. I used a simple plan when I rendered the car, applying on it a matte/shadow material from 3D Studio Max, and exporting the alpha channel in targa format. With Photoshop, I can make the global compositing of the car, background, shadows and the car. Then I was able to play with layers blending and some filter like maximise, I adjusted the hue and saturation, and corrected the colour to make the headlight look better and more useful in dark mood.

Portfolio examples
The Corner
by Fabricio Micheli

Concept
Home is the transitional place between us and the outer world. It's our domain. Our last frontier. It belongs to us. "The Corner" is a representation of that part of the world we call "home" and that is full of meaning. Every single thing we have in our houses tells something about us, and what I wanted to do in this art piece is to freeze the time of a special place in a house (a simple corner), and "read" only through the things we can see there. Light
coming from a window, old furniture, rusty walls, and the feeling that there were people there, just a moment ago, drinking some coffee, reading a newspaper and talking about the weather.

**Introduction**

I started with an idea I had in mind: indoor scene, classical look, strong ambient and warm feeling. The first thing I always do is the scene set-up. I put geometric volumes to represent the objects I’m going to create and after that I locate the camera (my point of view) to frame the scene and the light sources. It’s very useful before you begin to ask yourself “What do I want to transmit to the spectator?” In this project I decided to use a warm colour palette according to the topic. I chose (“Home”) and the idea I wanted to transmit. Because of that, the scene is lit with a soft yellow-ish light; there is a lot of orange in the medium tones and a subtle purple hue in the shadows.

There’s another aspect very important in the early stages of any scene creation, and it is to define the purpose of the 3D work. The answer to the question “What is this piece for?” is going to tell you a lot about some aspects of the scene you are creating. If you’re working to get a still picture, the scene will be different than if it’s for an animation. In this specific situation I knew I was going to render it in high resolution, and I only needed one shot.

**Modelling**

Modelling was a quite simple job (1). I used a lot of primitives (boxes, planes, chamfer boxes, cylinders, spheres) for the structurally simple objects (walls, floor window, chairs) combined with modifiers like bend, taper, FFD and so on. Other techniques I used were: “lathing” for revolving objects like the vase, tea cup, bottles, cups, globe base; “extrusion” for planar objects based in splines like the desktop front, window panes, “lofting” for the picture frame, magazine, curtains. The complex objects like the flowers (2), desk and window handles, lamp, tablecloth, hat (3), book, latin cross were made using polygon modelling and meshsmooth (subdivision surfaces) to get a softer look. Once everything was in the right place, I started one of the main parts of the job: texturing.

**Texturing and Shading**

It was one of the hardest parts of the workflow. I wanted a scene with rusty and worn materials, and some shiny surfaces to generate a good contrast. The only way to get the result I was looking for was using a big bitmap library to obtain multiple maps for multiple purposes. I found the answer in the 3DTotal textures collection, that I
widely used in the texturing process of "The Corner". The most used textures in this scene are bitmaps (2), and the painting and compositing process was very time-consuming. The original textures were layered in an image compositing software. I used dirty maps as alpha masks to get the rusty and worn look in some areas of particular layers like in the wall material. Blending modes help a lot when you need to mix layers (4). Some areas were painted by hand, and I usually darken the corners and borders of the bitmaps to diminish the contrast between near surfaces. As you can see, the texturing process is simple but exhausting, bearing in mind that sometimes you need maps for diffuse, bump, specular and alpha channels (sometimes even more than these).

**Lighting and Rendering**

Lighting was the most difficult part of the process. In order to achieve a realistic look, I tried to simulate real world lighting. The most common way of doing so is using an advanced render engine to control physically based effects like Global Illumination, caustics, colour bleeding and so on. In this case, I used the Mental Ray render. The scene has only one light source, simulating the sun coming from the window. It has a yellow-ish colour and a high multiplier. If we see the scene lit only with this light (only "direct lighting") the areas where it doesn't hit are dark (5). The way to fill the indoor space with light, is through the use of a bounced light model. We can get that with the Global Illumination feature. Mental Ray uses a technique called "photon map" (6) to calculate Global Illumination. It means that photons are traced from a light being reflected by the objects in our scene, until they strike a surface. Then, they're stored in a photon map.

In this scene, the first thing I did was the setting of the Global Illumination parameters. I wanted a photon size relatively big to see them overlapped but taking into account that the bigger the size the less the quality. Always use a low number of photons to preview the scene, and increase it for the final rendering. Another thing to consider is the trace depth control value. It represents the number of bounces of the photons in the scene. Of course, the higher the value, the stronger the colour bleeding and the indirect lighting in the scene. If we render the scene at this point, we're going to get a very weird image. To smooth the blobby and patchy look we need to use a Mental Ray feature called Final Gathering (7). It's an additional step you can use to
improve Global illumination, and it helps to reduce the artefacts produced by photon tracing. You have to know that Final Gathering can considerably increase rendering time so use low values for previews and high values for final renders.

**Compositing**

In addition to the Mental Ray main render pass, I wanted to add some volume lighting and a very subtle fog to the scene, but I needed to render it separately to have more control over these effects. I've found the solution using the scanline native render. I added a volume light environment effect to the main light source and I rendered an atmosphere pass (8). For the fog I rendered a Z-Depth pass (9), that I inverted later in a 2D compositing software. Once I got all the files, I switched to Photoshop to finish the whole process. The final image was obtained layering the following files:

The final Mental Ray rendered image.

A first layer where I loaded the volume light using the atmosphere pass as alpha channel.

A second layer where I loaded the fog using the Z-depth pass inverted as alpha channel too (I played around with the transparency value to get the desired effect).

A third layer for the window glow.

A fourth adjustment layer that I used to apply a gradient map with a “linear-dodge” blending mode (the base colour becomes brighter according to the blending colour).

A fifth adjustment layer to diminish a little of the saturation in the image

The advantage of keeping apart the different render passes is because you have more control over them giving to you the possibility of making a lot of adjustments separately. The final result was an image that represents accurately the original idea that inspired me to create this art piece. As a final thought I want to say that a real artist has to be the first critic of his own work. That is the only way to improve our skills, increase our knowledge and mainly, preserve that thing that makes everyone of us unique: our vision of the world.

**Portfolio examples**
Track Day
by Olli Sorjonen

Concept
I came up with an idea of making a race queen and an appropriate race track backdrop, I wanted the character to be slightly stylized, and non-realistic but still realistic enough that her body and head kept the realism of a real human, that of a cartoon character. I decided that the overall colour scheme would be grey and orange colours and the scene should have an overall warm feeling in the lighting.

You can see concept sketches of the character (1) and backdrop (2), usually I try to get some sense of the scene before I do any modelling, so that time and effort is only used on parts that are visible in the final render.

Modelling
I built the mesh based on an old character I had made earlier, making some changes I added more detail to the mesh so that curvature and shapes of the body are less dependent of meshsmooth. I also created a new head and UV mapped the whole character again.
Texturing

I used photos to get natural looking skin details for the body. All shadows have been removed and irregularities have been fixed so that the texture represents skin colour nicely. As I wasn't aiming for a realistic look, I painted the face in Photoshop to get exactly the result I wanted (3). I only used color (diffuse) map and bump map for the body, and did the rest of reflectivity with just even values for the whole body. It seemed to work well enough so I didn't want to waste more memory on maps for the body. For the head I made a color map, a bump map and a reflection map to control the amount of specular reflections on the face.

Tip: A neat trick to get good looking texturing for body is to have minimum number of seams in skin. It's best to unwrap character similar to methods used in skinning of a real animal.

Details

I brought in old eyes I had made earlier and replaced texture map with the one I made for this new character (2). Eyes have Raytraced fresnel reflection and specular reflection is made with white cards that are positioned behind camera. Clothes were constructed after the character was ready. I copied the characters mesh, then removed, leaving only the parts where the clothing would approximately be. Then I started reshaping those remaining mesh parts, using edge extrude, cut, connect and slice. When I had finished geometry, I painted a bump map for clothing so that I wouldn't need to add modelled creases and kinks. After all this was done, I modelled the umbrella. I used editable poly for the canvas, handle and body and created ribs with renderable splines.

Character Set-up

I made a quick rig for the character with bones and then skinned the character with skin modifier. I just wanted to get some basic mobility for the character so that I could pose torso, legs and arms nicely enough and maybe do some fixes with edit mesh when I had posed the character. I also linked hair guides, eyes and ear-rings to relevant body parts, as they didn't need to be skinned. Then I copied skin modifier to the clothing models.

Tip: A trick to avoid problems with skinning is to have identical coordinate systems in each mesh you're going to skin with the same skin modifier instance. You can do this by copying the main mesh and then use edit mesh to remove all polygons / vertices. Then attach the clothing meshes to this "empty" mesh.
Modelling Backdrop
I started sketching the backdrop with blocky objects. I
had the whole set made in a few minutes, ground is just a
plane, same goes for wall, grass is made with subdivided
and displaced planar meshes. Grandstand was made
with editable poly, using basic geometric shapes for
almost all details. Audience caused some headache, but
after a few failed tests I came up with an idea to use really
low res. blobby displaced 2D planes. This way I could
get lighting caught nicely on the character. A bump map
was also used to add detail and a cookie cutter alpha
mask was used to cut out character shapes. Motorcycle
was built in separate scene (5) and merged to character
scene. I did some adjustments to materials and colours
to make the motorcycle blend better to the background. I
also optimized details and removed some unnecessary
parts that were not visible in the render.

Lighting
Key light comes from behind, quite high altitude,
simulating afternoon sunlight. No other lights were used
for scenery. I didn’t have any fill lights as I used radiosity
to add ambient light. For the character I added a spot
array, about 5 lights in semi-circle to get smooth flash
light look and feel, as if a photographer had shot a photo
of the character.

Finishing the Image
After I was done with lighting and was pleased with
the image, I went on with post processing the finished
image. I created slight depth of field effect and did
colour correction to get a more dynamic feeling and right
atmosphere.

Portfolio examples
Scythe Wolf
by Robert Chang

Concept
For this piece, I used both Adobe Photoshop and Corel Painter. The piece depicts the main character of a story I wrote called Scythe Wolf. Lulu is the main character, the seven wolves are her companions. At one point, the story was being developed into a CG animated TV series at Optidigit (Steven Stahlberg’s CG animation studio, where I was a writer/director/art director), but due to budget problems, the project is on hold.

I almost always start a piece with a rough sketch (1) (I often add a multiply layer filled with light grey on top, because white is too bright and hurts my eyes), which I keep flipping horizontally to refine. Flipping images horizontally reverses the left/right hand bias we all have (my theory is that our brains are wired differently according to which side we favour). Something might look fine to you initially, but after flipping the image horizontally, you’ll notice all the proportional mistakes like crooked eyes, lopsided body parts etc. Once I refine the rough sketch to a point, I start a new layer to do the clean line drawing on (I hate having to erase stuff a lot, so a new layer works much better). I usually add a layer filled with light grey, change the opacity of that layer to about 10-20%, then add another layer to do the clean drawing on (5). This gives me a faint version of the rough sketch to base on, and I can see the clean lines I’m drawing on top easily. (This is like a digital version of an old trick I used in the old days of doing traditional art. I used to use a lightbox and layers of paper in a similar way).
After the drawing is done, I go ahead and add another layer to start painting in the colours. The colour layer is usually either a multiply layer above the drawing, or I put the colour layer under the drawing. Either way works as long as I can still see the lines (2). After filling in all the local colours, I add another multiply layer where I add the shadows (3). Having the shadows on another layer makes it easier to change things as I do without doing extensive repainting (4).

For some reason, I felt that the drawing I had was a bit clumsy, so I went ahead and did a better/cleaner one (5). I also didn’t like the colours I had, so I basically started over, using the same steps as before (6). I kept the shadow layer for as long as it was useful, and worked on the details on the main colour layer instead. This way, the shadow layer acts almost like shadows in real life do it makes everything underneath it darker. Once I have most of the important details in (after painting in the wolves, the tree trunk, the general shape of the ground, dirt, etc), I went ahead and flattened the shadow layer onto the main colour layer (7).
I used the dodge tool to get the metallic look on the scythe (8). It’s one of the few things the dodge tool is really good at. For the dress, I had my wife wear a similar styled Qi Pao and took some reference photos to study. Painting satin (9) with a lot of patterns is not an easy task, and it took a while to achieve the look I wanted. The fur on the wolves (10) was easy by comparison, since something like fur leaves a lot of room for variation. It was important for me to paint the fur in Corel Painter because of the way I can set the brushes to blend with bristles. Any of the oil brushes would work, just turn the bleed up and the resaturation to zero (I use the opaque round mostly). The foliage turned out to be the hardest thing to paint (11), since I wanted a specific look, and had to keep repainting the foliage formations to get that sense of lushness I wanted. After the piece was finished, I posed it on online art forums to get feedback, and then work those feedbacks into the painting if I agreed with them. This piece has been featured in magazines and books, and has become one of my most well-known pieces.

Currently, I’ve noticed things about this piece that I no longer like, and I might do some repaints in the near future (for example, the shape of the tree, Lulu’s nose, the design of the scythe etc.).

Portfolio examples
Opus Premier
by Haure Sebastien

Modelling
From experience, I've learnt that it's not necessary to make the edges strictly flow with the muscles. In fact, one secret of a good organic model is the ability to feel flesh, possature and other anatomical components through a part of the model (1). In other words, to fake what happens behind the skin represented by the surface geometry. The model needs to respect some rules to be a good representation of the reality, such as gravity or weight. The character comes alive when a mass can be noticed. The body of the snake was one of the quickest models I've done. Basically, it's made with a nurbs curve, and the snake's body could be changed if necessary depending on the woman.

No references were used for her face as people who I meet in everyday life provide me with a large library of topology. However the essential thing was to make her beautiful and innocent. The main challenge was to express a significant feeling through her facial expression.
and posture as much as possible. I created several facial shapes and combined them to get the right emotion. However the angle of the camera and the inclination of the face made me exaggerate some shapes. Therefore the most important thing before starting a scene, is to correctly place the camera (2).

Due to the deadline, I had to find an efficient and fast way to achieve some nice mesh deformations. This constraint must be anticipated before the modelling and the fact that the image is fixed, makes things much easier. From the beginning many solutions were possible, but I decided upon Maya thanks to its intuitive modelling tool. A very low poly mesh enabled me to get good proportions and rough deformations using the smooth bind tool. At this stage of production, I had a good representation of my final image. Zbrush was an obvious solution to tweaking vertices, refining and fixing deformation problems. A method which is quite useful for additive shapes and animation setup.

Texturing
From the beginning I chose a particular style, which did not require a lot of detail. On the contrary, the less detail there the better. In moments, the audience have to understand clearly the essential elements. To remove all of the useless detail is a good way to achieve it and with only one dominant colour this explains why there are few maps in this scene. The girl represents purity and that’s why she has no imperfections or blemishes such as wrinkles or skin tones. Although shave & haircut provide a good system, my RAM configuration forced me to make the eyebrow with a texture. To have a fine accuracy, it’s better to use a 3D paint package and, in this case it was BodyPaint (3). A greyscale map allowed me to implant the root hair with shave & Haircut and then, I had to convert the hair to poly’s due to RAM memory limitations. Indeed, the baking solutions are my best friend and the low value of the parameters made the mesh very manageable.

As the snake is a nurbs surface, the UV’s allowed me to create an easily tileable pattern skin in Photoshop. Normally, I would customize each part of the snake texture to add realism, however its material is composed of “metal flesh” a kind of metallic creature seen in J.Bell’s illustrations. In this way, a strictly tiled pattern applied on the skin is still interesting. The concept of metal flesh also gave the snake another dimension and helped portray it as a symbol rather than simply a creature.
Lighting & Rendering

I intended a stylized aspect because of the artistic intensity of the scene but wanted it to be realistic enough to appear coherent as a model. So, I came up with a basic solution that involved a Ray-Trace pass. In a few words, this could describe where the surface needed to be shadowed, taking an occlusion effect (4) into account. I dramatically decreased the rendering time by storing this information in a map and the Renderman efficiency and features best fitted to my needs. Even if this kind of lighting technique is available in other render engines such as Mental Ray, the utilisation of PRman is more familiar to me. Although it looked quite convincing, I felt that I needed to create more lights. However, it allowed me to reduce the need for additive lights. A key set of lights gave a main direction and intensity and back and fill light passes helped to perform the bouncing light. Most of the lights are shadow mapped and some of them are area types to perform a softer look with distance attenuation. The background is a mixture of 3D procedural and hand-painted map composited at the end and regretfully I didn't have time to create a more natural one.

Well, I think that there's not a unique solution for the specific result, but rather a multitude of approaches resulting in a compromise. Depending on the quality, there are different methods available. The objective is to feel free and efficiently with the software used and for sure to have fun. This is what I've done.

Portfolio examples
Breath
by Drazenka Kimpel

Concept
I wanted my character to be in charge of the scene, strong and powerful. A person of a regal stature worked out perfectly. It would make sense to build a castle around it but what’s the fun with that? Every new project and idea I want to be something new and refreshing, something I don’t paint very often.

After many hours of research I found a few very good photo references of icebergs and loved the colours so much, I decided that kind of environment would work beautifully with my image. I loved it not just because of the colours but it has been a very hot year down here in South Florida and the idea of an ice cave sounded extremely good at the time.

I usually start by loosely sketching the character on paper (1). I am not worried about the line work as I use it only as a guideline. My main concentration is placed on posing the character and getting the proportions right. The details are always done on the later stage of the painting.

Painting
After scanning the drawing into Photoshop I played with the colours a bit to see if it was going to work the way I planned it. I sampled colours from the reference photos I found but it was difficult to find out exactly how ice reflects light, especially in the closed areas (2). The safest way was to go without a direct light source and concentrate on getting the feel of ambient lighting.
Painting the cave took many hours, using a very limited colour palette. In order to keep everything in balance, the character had to stay within the colour palette as well. The layer with the drawing was set to multiply, then I created a new layer underneath it and painted the body and portion of the dress (3). To make sure I got a nice, clean edge I used the pen tool and outlined the whole body (4). Then I converted the path into a selection and created an Alpha channel. (I created separate Alpha channels for the portion of the dress as well).

From the beginning I knew I wanted the big rock (5) that my character is leaning on, to be a piece of a broken iceberg. This was the most challenging part of the painting process. I tried many different approaches to paint the iceberg but they were not to my satisfaction. Before I gave up completely on the idea of having an ice rock, I gave my knowledge in vector a try. I opened up Illustrator and imported my painted background of the cave. Step by step I started to form a crystal. The base for the rock was done using gradient mesh and in that way I could use all the shades of blues with very interesting blending. To create the sharp edges of the rock I painted layer upon layer of triangle shapes on the top of it. Some of them I converted into gradient mesh to add to the depth and some of them were left a solid colour. The process was very labour intense but the final results were better then I ever hoped for, so I decided to keep it as it is.

Back into Photoshop I incorporated my newly painted rock into the image by applying a few soft brush strokes around the edges of it, adding shadows here and there and some light reflections on the bottom which unfortunately ended up being covered by the dress but they are there, trust me! I also carefully erased some of the mass from the middle of the rock so it could appear "clearer"
Painting fabric is one of my greatest pleasures. I think having a nice flowing drapery adds softness and richness to the image and also brings some of my personality into it. Since my character was a kind of “royalty” she needed richness and elegance to surround her. I wanted her dress to appear as if she was wrapped into a frozen type of liquid. For this step I used basic hard round brush alongside the dodge tool to accentuate the highlights in the fabric (5). The only bit of actual texture was done on the fabric itself. If you look at the frozen ice, there are endless amounts of shapes within, sparkling in the light. After reviewing several different snowflake shapes, I found one that was big and rich enough for the job. I extracted the snowflake shape (6) from the original fabric and placed it onto the painting. To make the shape stand out more, I applied a soft shadow underneath. Each shape then was distorted using the transform tool. This way I could place them accordingly to fit within the perspective. At the end I added some sparkles over the whole character and dress with a very small paint brush and “voila” the sparkling and shimmering ice was done.

Portfolio examples
Freakshow
By Romain Côte

Concept
The original idea of the picture came from many inspirations. I've had a rough vision of the image in mind for a long time. I've always been fascinated by freak shows, mainly since I saw cinema masterpieces like Elephant Man by David Lynch or Freaks by Tod Browning. I find it a very inspiring universe. I like the idea of monstrous people being more human than "normal" ones, what their feelings could have been and the feelings of those who exploited them. I like to explore these kinds of ambiguous personalities and am also fascinated by the end of 19th century: the World Fair in Paris, the old London, the "art nouveau" style, that kind of stuff. I only made a very rough sketch of what I had in mind but I searched for many references from comic books, old photos of Paris in 1900, freak show photos, and even screenshots from the penguin character in Batman Returns by Tim Burton helped my character.
Modelling

I started by modelling the character, first by building the head from a previous one that I simplified. The idea was not to give him a classic “bad guy” look which would have been too obvious, but a more subtle, ambiguous face. At this stage it looked even friendly (1). Then I started on the clothes. The technique I’m using is to model low res. objects to be able to find correct proportions easily (using lattice deformers for example) and then add detail gradually, changing proportions a bit if needed, adding higher details, etc (2). Some modelling details like shoe laces were left till later when the character pose would be finalized. With the bird, the body shape was pretty simple because I knew I would be going for very dark shader, I modelled 2 different feathers and then just duplicated and spread them over the body one by one, which took me some time but was the best way to get exactly what I wanted (3).

Both characters were rigged and skinned very quickly in order to pose them. The set modelling was pretty simple. As for the character, I first made a very rough and basic version of the props which are easy to lay out in the scene. At this stage I start searching for a final image composition and framing to see what will be eventually visible and therefore what needs added detail. I set up several camera positions and varied the settings until I was happy with it. Then I know where I need to add details and where not to.

Texturing

I tried to use ZBrush for the first time to make some colour textures for this work. I used it on the character jacket and his head, but mainly used Photoshop on the scene (4). With regards to shading, I used the Diffusion shader for Mental Ray to achieve some sort of Sub Surface Scattering effect on the character skin but tried to keep it really subtle. I didn’t want to get that “wax look” we see everywhere since Sub Surface Scattering is possible and easy. Apart from this, nothing particularly special was used.
Rendering
This was the first time I used Mental Ray to complete a picture and I wanted to experiment with some simple features of the renderer. After some final gather tests that didn’t please me much, I decided to go for “classic” lighting. There are basically 4 lights in the scene: one point light converted into Mental Ray area light in the lantern, one dark blue-ish directional light coming from the sky, one back directional light coming from the right with low intensity and finally one point light only emitting specular on top of the roof just to increase more shine to the metals (5).

I used a volume primitive combined with Maya 3D textures to achieve the fog. I rendered a colour pass and an ambient occlusion pass with Mental Ray, using the Dirtmap shader and finally I composited them in Photoshop adding a specular bloom pass and some details: color correction, contrast, painting tiny hair on the chin.

Portfolio examples
Concept
As tempting as it may be to jump into that favourite 3D software package head first, I now know that it can be very rewarding if not essential to have a plan going in especially when just starting out as a 3D artist. The AIRMAN was my very first project in 3D. Now that I look back, I think that what got me through it all was my wife, the help of the forum community and the fact that I was learning 3D itself in order to breathe life into a concept sketch. To be honest with you, if someone starting out were to come up to me now with what I was trying to achieve then, I would probably advise them to start out with something a little less complex. Having said that, I believe with dedication and a solid concept sketch anything is possible. For me, working without concept art is like building the foundation for a house you’ve never seen! By not generating your own concept art you are depriving yourself of the focus that is required to learn or produce to your fullest potential. Even quick thumbnails can tighten the scope during the production of your project. This will ultimately prevent your mind from wandering over to the technicalities that often distract new, as well as, experienced 3D artists.
Modelling
Having recently learned Maya I now realize how powerful Blender truly is. Being a polygonal based modeller myself I really admire the predictability of Blender’s vertice extrusion tool. While I could have achieved similar results pulling edges and faces, I really like the control I have over the birth of the mesh on a point-by-point basis. Nearly all of the modelling for the AIRMAN was done in this manner. As a matter of fact it wasn’t until starting on Brox (supporting character,) (2) that I started to use subdivision surfaces. After that I went back and converted nearly all of the AIRMAN’s meshes to Sub-D’s as well which Blender tackled with ease, although, if it wasn’t for Blender’s ability to queue smoothing display levels for render time on the fly, I probably wouldn’t have even been able to work Sub-D’s into my pipeline as a newbie with an indie budget. Its kind of funny though, it wasn’t until I had more than half of the AIRMAN complete that I knew what topology even was let alone how to control it [Landis laughs]! I think there is a certain point in everyone’s career where they realize how little they know. It is at that point that we decide how good we want to be.

Texturing
One thing I learned early on was that great modelling can be done inside of Photoshop. Every little detail of an object doesn’t have to be geometry...and it shouldn’t! When designing the “shaft-o-matic” (3) which was a prop for the AIRMAN’s supervisor, the majority of the work was done in 2D. The head of the shaft itself was nothing more than a polygonal based cylinder with bump maps applied to give the illusion of inlaid bolts around the mass of the head in addition to the bloody gore at the tip. I am also very careful with my use of specularity which makes it stand out even more when I choose to use it. An example of this would be the shiny empty brass (shell casings) on the ground next to the AIRMAN’s feet as well as the “greasy” looking head of the shaft-o-matic itself. Anyone who has really worked around heavy machinery is aware of that oily residue that lives on the surface of these objects and a specularity map tends to take care of this quite nicely. I really can’t imagine not using a spec and bump map to accent any colour map regardless of how complete or detailed it may seem on its own (4).
Lighting

My objective here wasn’t necessarily “real” but “believable.” At the time I knew that if I were going to end up generating a short film based on this theme (a desert deployment) then the setting would take place mostly outdoors, so, I lit the AIRMAN as though he was standing under a blanket of light...literally! First I generated a “cool” (blue) spotlight just above the character with a subtle intensity and a somewhat soft shadow influence. I then duplicated and positioned the light multiple times by hand to form a hemisphere of illumination (5). Next I selected all of the duplicated lights and parented them to the first. Parenting simplifies the workflow allowing me to fine tune the entire dome on the fly through the attributes of a single light. Once these “cool” lights were in place I created a “warm” (orange) spotlight towards the lower front of the dome to simulate a sun just off the horizon (6). Finally the “dome” was linked (assigned) to all of the objects in the scene except for the eyes which were lit exclusively by the sun in order to produce the type of hot spots (specular highlights) I was looking for. Later on, after texturing was complete, I used a test render of the character as a reference for a colour palette while transforming some of the “cool” lights into “bounce” lights to simulate radiosity (the process of light bleeding from one object to another). While tedious, I find this method to be very rewarding in the end due to the amount of control it gives me over the lighting of the entire scene on a global level.
Tears Wont Fall
by Linda Tso

Concept
I often draw girl faces just for fun, if I'm not doing any serious work. I really liked how this particular face turned out, and suited an idea I had later, so I decided to develop this into a full painting. I find it irritating if I can't get the face to "work" so even when I start a picture without a highly finished face such as this (and I usually don't) I tend to work on the face early on until I'm satisfied with it.

I wasn't too happy with the colour of the first face sketch, so I duplicated it on a new layer and set that to Soft Light blend mode with lowered opacity. This pushes the colours to a lovely rich golden tone; the hair in particular, looks much nicer. I then expanded the canvas size of the face sketch and, using big brushes, scribbled out a very messy sketch that focuses on the big elements of the painting. It's a good method because you can quickly work out how the overall image would look like: the pose, the composition, and the general colour scheme.

Once I get a clear idea of this, I gather some references for the pose, including photos I've taken myself. In a new document I start drawing a more or less legible line sketch (1). This is the final sketch that I would use when I start painting; I went through many different designs for the costume before I arrived at this version. Most of the details are in place now.
Painting

Here’s where the fun begins! I start with the colour-adjusted face under the line sketch, and using the sketch as a guide I block in the major forms. I pick colours from the face for her skin. I’m not sure what I want the background to look like at this stage, so I just put in lots of different colours. The tear bowl and hands are still very rough at this stage (2).

I continue to refine the form of her body, the dress and hands. I also soft-airbrushed the skin to smooth it out a bit, and put in some subtle green and purple, and bounce light. Note the reflected skin colour on her dress, under her armpit area. All this time my line sketch layer is still above the painting in Multiply mode. I still haven’t decided what to do with the background so I blot down more random colours there, and then leave it to concentrate on the figure (3).

More details on the costume, I didn’t follow the initial line sketch version exactly, the most noticeably different part is probably the pattern covering her stomach. I used the dodge tool set on Highlight for the small metallic highlights on the jewellery. The dodge & burn tools are considered taboo sometimes, but for the effect I want to achieve here they do the job well (4).

I showed some friends the image at this stage and a few suggested I slim down her waist and sculpt her forehead a tad. I’ve been looking at it for so long that her elephant waist completely escaped me! Even after multiple times of flipping my canvas horizontal... it’s always good to have fresh eyes that can identify problems you may be used to seeing (5).

Painted hair and hair ornaments on a separate layer, I used the default hard round brush in Photoshop and custom ‘hair’ brushes. The bracelets look awful, so I erase them. I refine some shadows where needed, and start working on the flying sheer cloth bits (6).

At last I decided what to do with the background. I had the idea of a stylized background but was never quite sure what it should be... I look back to the colour sketch and thought a simple sky and clouds background would be the best choice with the light blue I used (7). Sampling some colours from the colour sketch and picking some more myself, I paint in the sky on a layer on top of the hair layer. I let the sky layer bleed into the hair a little.
Seems much fresher with the blue, doesn't it? The tear bowl finally got some attention too; its final design, like parts of the dress, differs from the line sketch (8).

Because the original face I painted was quite small, I had to upscale it. I go over the facial features (especially the eyes) with small brushes to sharpen things up. I painted the four teardrops near her face, using very tiny strokes of pure white and saturated spectral colours. These are then duplicated and moved/transformed to make the rest of the tears near the tear bowl. I changed the direction of the clouds in the upper right corner to help them flow better with the overall composition, and tighten up some little details to bring it all together. This is when I consider the image finished enough to show it in public forums for critiques (9).

The one thing that people noticed was... her huge nose! It didn't really occur to me, but the bridge of her nose was way too narrow for the cartilage part, or vice versa. So, back into Photoshop for a nose job! I tweaked some other areas that I thought could be improved as well: a bit of colour variation in the sheer cloth, stronger wet highlights in her eyes, small shadow fixes et cetera, and I call it finished.
Autumn
by Natascha Roeoesli

Concept

The idea behind this painting was to visualize the personification of autumn as the first of a four painting series describing the seasons.

Based on my childhood memories of autumn along with personal feelings associated with this season, I came up with several ideas I wanted to include in this painting.

It was clear to me from the start that the main focus will be on the character: A girl whose face was to be happy and joyful in contrast to an otherwise dead and monochrome environment. Furthermore, I wanted to recapture the childlike fascination I had surrounding floating and colourful leaves. Autumn takes me back to my younger days when I loved to run through the leaves and kick them around. It reminds me of the fresh, yet cold air and the sun shining through trees. The season can also be quite depressing though – foggy and sometimes the colours all seem to vanish into nowhere swallowed by a mysterious creature.

The first step was to come up with some rough pencil sketches and look for references, starting with her facial expression (1). I always keep a mirror close to my desk which allows me to study various facial expressions in order to see how the face muscles work. I apply a similar concept to body poses, by searching through references depicting different parts of the body. Hands are always difficult, so I keep a stock of pictures of hands in a folder. There are also several online libraries especially for artists with hand references in different angles. I wanted this piece to be as realistic as possible and I wouldn't have been able to achieve this without several references mixed up to create the final sketch. It would take me quite a while to explain all the different little details I put into the piece but be assured that all of them have their own (more or less) obvious meaning.
Colouring

Working directly from my line drawing, I then begin the painting process by duplicating that layer, making sure to keep a hidden copy. I achieve that process by setting my background colour to the colour I want to work with, hit ctrl-a, ctrl-x and ctrl-c. This process will cut out the line-work and add it to a new layer. As a finishing touch I adjust the brightness and contrast as needed. Next, I adjust the channel tab by clicking the little circle icon on the very left bottom, effectively selecting all the white in your picture. After hitting delete it will leave you with your separated line-work on a transparent layer. Finally, I change back to the normal layer tab and click the little lock icon on top. By adhering to this procedure I ensure the transparency will be preserved enabling me to paint over my sketch lines with any colour, either to adjust it to better fit the actual painting later or to make it darker again.

To start painting, I fill the background with a colour if I haven't set the background colour to something appropriate while cutting out the line-work. In order to keep my picture consistent I'll need to include a general colour since this ambient colour will also influence everything on my character.

First, I use a blue gradient on the background (2), aware I will eventually want to mix it with red, creating a cool reddish/brown appearance. Next I added a new layer between the background and the line-work layer to add basic skin and dress colours (3). To adjust the colour scheme I added a new layer on top, filled it in with a desaturated red/pink and experimented with the layer modes and opacity until I had a colour scheme I liked.

At the very early stages I used the Photoshop leaf brush to rough in the location of the floating leaves, keeping in mind I would later paint them by hand (4). As I mentioned earlier it was already clear that I would use a rather monochromatic approach to further define the depressed feeling I wanted the environment to have. Therefore, I sampled colours from the background with the colour-picker and started to work on the figure's facial features located on the colour layer. Again, there are different approaches to this process and most artists tend to define the colour scheme over the whole painting first before starting to add details. Due to the fact that I didn't have a very complicated colour scheme, I didn't consider it necessary and started off with defining her face, something I love doing the most.

Gradually I started to add shadows using the hard edged paintbrush set to around 50% flow and 1 pixel tip (5). I normally approach my paintings differently but, to get that clean crisp look I used the tool paintbrush as if I was colouring with pencils. Essentially, this means that tons of strokes helped me to slowly shape up her face. Once more I used the colour picker to help me to keep the monochromatic look. For example, the brightest colour in the background also defined the "white" of her eyes.
I tend to change facial details around on the fly. Sometimes they end up looking totally different than the actual sketch. Initially, I rarely have an exact idea of the face in my paintings, but all of a sudden it clicks and I know I've found a good solution (6). Switching the painting horizontally, to check balance and placement of eyes/nose/mouth is a great way of correcting mistakes and turning an "alien" looking face into something more human. More details, like work on her hair, her cloak and the actual dress design were added directly in Photoshop. The idea for her dress (7) was to have some kind of leafy pattern but I considered that idea to be too obvious and decided to go with something more representational. I also had all different kinds of versions for her cloak (8) but ultimately I went with the one you see in the final piece. My original plan was to have the cloak appear as if it was floating in the wind but it proved ineffective.

You should try not to work with too many layers in Photoshop. It's not only hard to keep organized but you will also increase the file-size of your PSD-file and will give your hardware a tough time. I had one layer with the background, the main layer with the character, a layer for her hair and for jewellery and a foreground layer. I added new things on a new layer and would then flatten it down to the main colour layer as soon as I was happy with the changes/additions. The background was painted by sampling colours from the character. Whenever I'm painting backgrounds I'm on the lookout for "happy accidents" I start adding colours until I see something shape up - a rock evolving or a tree shape at the horizon. That is what I need to work from - from there I develop and add more details. After asking several friends for input I flattened the picture and used the colour adjustment tool to do some minor tweaks.

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**Portfolio examples**
The Fatman
By Omar Sarmiento

Modelling
The fatman has been modelled with subdivision surfaces in Lightwave following the patch modelling method. I started building the eye area, alongside the nose and the mouth, which are the key elements of the model, and then later welded them together which then formed the basic facial structure (1). It’s important here to create a good simple mesh topology to ensure that the model will respond correctly to facial deformations. It’s also a good idea to study the muscles of the face and how they behave. I have tried to keep the mesh as simple and clean as possible, and by doing so the process of tweaking and characterization of the model is easier and faster.
Lighting
This model has been lit, textured and rendered with Softimage XSI. I have used Global Illumination in this case within the Mental Ray renderer. The lighting set-up is basically a kind of three point lighting rig (2): I have used a spotlight with soft area shadows as the key light, and as a light I have used the final gathering (Global Illumination) effect taken from a background image, and then finally added another spotlight with area shadows as the side light to separate the image a little from the background and give some mood. I played around with the light colours to give some variation to the image, for example the side light is blue tinted. In this work and in general with works where realism is the aim, we must take good care of our lighting set-up because it will be the base of our work and it’s intimately connected with the texture/shading process, so our textures will not look right if we fail at this point, on the other hand, the lighting has helped define the volumes of the model and create the overall mood in the scene (3).

Texturing
The texturing and shading process has been the most elaborate and the most challenging too. The human skin is one of the most difficult things to render in the digital medium in my opinion. I started with the shading process without textures, with only a diffuse base colour and the bump map applied, and tried to simulate the properties of the human skin. One of the most important aspects of the human skin is its translucency so it was my main aim to reproduce this. I used the “Diffusion” shader (4) created by Daniel Rind (http://animus.brinkster.net/stuff/plg_diffusion/plg_diffusion.html). If you don’t use XSI or Maya you can use some other sub surface scattering shaders available for 3D Studio Max, Cinema 4D, Lightwave etc. The Sub Surface Scattering effect consists of the result of the light travelling through the skin. It’s an effect easily noticeable in the ears but it is present in the whole skin in some degree. Sometimes it’s difficult to achieve the Sub Surface Scattering skin effect so a good idea is to start with some material that has this property but easier to notice and reproduce like wax, so a good starting point would be some wax like material.

The next key element is the specular/reflection layer, both of which I have used and combined the specular from the area light and real reflections from an hdr (high dynamic range) image, which help a lot in simulating the oily skin surface. When I was happy with the overall aspect of the skin material I started with the texture painting. All
the texture maps have been hand painted in Photoshop, the first one being the bump map (5), which was made previously to the shading because it's like a part of the sculpting process. I took a lot of human references and close up pictures of human faces to see the wrinkles, pores etc. then I started to paint the main features and checked continuously in the render to see the results.

The colour/diffuse map (6) must be very detailed and should have a lot of variation and so I started painting the base colour and then adding spots of different tones and variations to achieve some irregular and balanced organic aspect. Another good idea is to copy the wrinkles and pimples previously painted in the bump map and copy them here giving them some saturation and an overall reddish tone, which will help with realism. Another couple of texture maps were made to control some specific shading parameters like reflection, specularity and glossiness, which were made taking the bump map as the base and editing their levels and brightness/contrast in Photoshop.

Portfolio examples
Character
by Ryan Lim

Concept
Macfarlane’s Spawn character is one of my favourite characters, so I enjoyed the entire process during its creation. First of all, Spawn is based on the comic, therefore the muscles don’t look like an ordinary man. There is more exaggeration. So I think the most significant part is how I can make the anatomy look more reasonable. Simply, “trying to retain the style while keeping musculature in consideration.”

Modelling
Before I started to model, I began researching anatomy which can make it much easier to build body shapes (1), which is how Spawn began. I decided to change the proportion and muscle shapes in the chest because the hero character has an eight or nine head proportion which is more larger than a human’s (2). In addition, Spawn has an exaggerated chest, shorter and wider than an average man. His legs follow suit, being more stylistic than anatomical. Secondly, I wanted to model him with extreme detail. When I’m working in Maya, some of the tools I use are “soft modification” “painting sculpting tool” and “M-poly tools”. These help make it easier to control the high-res. model while making the sculpting process more fluid. When I have finished the Proxy, I can then transfer the Maya file to ZBrush (3). ZBrush can make extremely high resolution meshes, which I used to add all the small muscle and vein details with a tablet (4). Creating the displacement wholly in ZBrush will make it easier to bring realism to the renders.
Texturing

Spawn’s textures are made using painting techniques in ZBrush, because if I want to use the displacement map, I have to use ZBrush texture mapping (5 & 6). If I make a texture in Photoshop, I won’t see the final shape, so I finished the texture in ZBrush. Actually there is a helpful tool which is ZBrush projection mapping. If you don’t want to spend the time in unwrapping the UV’s, I recommend you use GUV (Group UV) as it can automatically make an even layout of quad UV’s. If you don’t like this method and would prefer using Photoshop to edit your texture, I recommend that you unwrap the UV’s first and, if you do this beforehand, you can still use ZBrush but with the added option of mirroring your UV layout. I copied the colour concept of Spawn and surface material from the cartoon of Spawn and an action figure. Actually I didn’t like a simple purple colour on the body (7), so I added middle red and light blue colours which can maintain a purple colour.
Lighting

I set up the lighting in 3D Studio Max because I chose Vray as my render program, which supported a fast Global Illumination solution and its own displacement. All of the shaders are Vray specific which make it much easier to get a more appealing result while keeping the render times optimized. Vray's materials are excellent, but one of the features that Vray doesn't support is micro displacement. Without micro displacement I can't make the model exactly as it appeared in ZBrush so to get around this I used a bump map which can make up for the loss of smaller details. I chose HDR lighting because it can achieve a much better look if used properly but one problem is that it is much harder to control than a 3 point lighting solution, and is nearly impossible to get a proper rimlight. Vray's soft shadow also helped, as it is much faster and is nearly as accurate as an area light.

Finally, I render everything in passes each with a separate part of the model. Because displacement maps can use a great deal of memory, sometimes making it impossible to render everything in one pass. So I recommend dividing your render into passes. When you are finished rendering, you can simply bring all of the separate passes into Photoshop, where you can modify each layer to your liking (8).
Masquerade
by Egil Paulsen

Concept
The idea behind this picture was meant to reach most of us. Our environment makes us put on masks to fit into different situations. These can be common roles such as being a student, belonging to a religion or hanging out with "friends". I think this image illustrates the point where we realize that we are becoming something we are not. We are living in a great masquerade, hiding our feelings and pain behind a decorated and unconcerned mask. I had this image of a person confronting herself with the white mask.

Painting
This walkthrough of mine will focus on how I made the face, hands, and a little technique on how to make realistic hair and fur. I have made the painting from scratch in Photoshop, so I may borrow a few notions from the program I started sketching a profile of the face. Then I made some decent lines on top of that as a new layer, and removed the original sketches that were underneath it. This is what you see on this picture, after removing the rougher sketch. This gives me a great orientation of where the ears and eyes are. So it is basically just a pencil sketch which you can paint on, but I can remove this one afterwards, because it is a layer. This way I can easily edit the sketch, experiment with poses and still keep the actual painting clean. After I have lined up the character, I use a bigger brush with low opacity and put on some shadows and highlights to specify the light direction. Usually I start off painting on a white canvas, so it is hard to highlight anything here. I like to save the highlighting for later, because I might not have decided the setting and surrounding elements yet. I added in more to this sketch like the hair and a possible hairstyle for her. At this point I experiment a lot with the composition and balance of the picture, but I don't make a decision about the final image yet (1).

The main skin colours here are actually picked from a photo that I was using for reference. I also chose the
hair colour and some other colours that might blend in well. I am not following any written rules here. I take what I like and what it may symbolize. So, I painted some very rough strokes where the colours should be. I am painting on the white canvas with the sketch layer overlayed. As you see it is translucent so I can see at what I am painting at the same time. The great part of my sketch is that I now know exactly where to put the dark skin tones and the bright ones, following the shadows and highlighting. Between the dark and the bright I blend the colours together which could be compared to oil painting techniques.

After hiding the sketch layer I started a more decent paint job. I first painted it all with hard brushes with about 50% opacity. When it looks realistic from a distance, I go over to big soft brushes to get that round and smooth skin. What I often do is pick the colour from a spot, and paint over it with a huge soft brush. This way the edges and hard strokes get a smoother surface. I never use the smudge tool, because it will only make the shades move out of position (2).

And then it was time for her hair (3). Many people have asked me how I make hair look so sharp and realistic. So I decided to make a very simple tutorial. First shape the hairstyle with a big and strong brush. Then you can go over the edges with a much thinner brush. It will look like the big strokes are put together by thousands of those small strokes you made. It saves you a lot of time and it is easy. However, this technique requires you to have a pressure sensitive drawing tablet. This way you can easily give the hair pointy ends. The next thing to do is to make the hair look 3D and shiny. Use a thin white brush and follow the waves and highlight where the light naturally reflects. This requires some study though and if you do not have a model for reference, you will need to decide on the direction of the light source and work accordingly (4).
Painting a hand holding a mask isn’t as easy as it looks. A hand is a very complicated object and, with a few odd shadows you may ruin its natural behaviour. I contacted a friend of mine to photograph her hand holding a tennis ball in a pose similar to the painting. An important thing was to use the same light direction I had in the painting, so after numerous shots we found the right one to work with. Now I could refer to the photo whilst painting which is a lot easier than having a model posing for you since I did spend a couple of hours on this part (5).

After painting the hand, I placed a mask where it would fit into the hand naturally. The mask was first supposed to be made out of gold and decorated with jewellery and so on. This would be an ironic facade of wealth and richness. All that glitters is gold. But I changed my mind and made it just pretty simple and white. White is for innocence. I also changed the facial looks and gave it a hint of a smile. To present my concept, I spent a little effort in the clothing design. I had this white mask, as a shelter for her, but I wished to expand the idea by giving her a corset. The corset represents a fundamental shift in the concept of clothing and tailoring; instead of shaping clothes to the body, the body was supposed to conform to the fashionable shape of the clothing worn. However the corsets strangled these fashionable women so they almost couldn’t breath. This is my idea of being shaped by expectations from people around you; expectations which can be strangling and painful living up to. Her skirt, with a pattern of black fox heads, represents the bestial in the whole situation (6). Even if we live in a great masquerade, we still cannot entirely remove what we are.

Portfolio examples
Brachioide
By Laurent Gaumer

Concept
This strange character was created before I started to make CG images. I had a few drawings coming from a role playing game called “Shaad”. In these original sketches the Brachioide had a semi-transparent body: everything was transparent as water except the nervous system, the eyes and a part of the bones.

When I started thinking about a 3D version of this creature I was attracted to making a jelly-fish like creature. After a while, playing with the materials in my 3D software I realized that making such a skin would not be easy at all. Obtaining a convincing result involved a long time rendering and furthermore, the subject would have been hard to light correctly.
Finally I decided to invent a different race for the Brachoides species: a less transparent one. Only tiny parts of the body would require transparency and refraction like appendices and eye areas. Another important point was to focus on the way this character would live. Brachoides live undersea so they are coming to the surface seldom. When doing so they must wear an air-proof suit (1). It’s a kind of armour which assists in movement and gives strength and prevents the creature from breaking his fragile spine.

The character I wanted to illustrate was a scientist coming to “earth” for a secret mission. His race can be recognised by the fluorescent dots around their eyes. The suit is bigger as it can accommodate food and clean salted water for weeks. It also contains survival kits and useful amazing tools.

Modelling
The first thing I had to do was start to model the head from a simple box (2). I worked with the pictures in mind in an intuitive way and I tried not to focus too much on the references and therefore freely design the main shapes. At this point I decided to focus on the head. I had a picture in mind with a detailed helmet full of liquid, bubbles, tubes, filters and mechanics (3). Making a sketch of the illustration was a funny thing. I used a render of the head and drew the helmet over to make sure it would fit the anatomy of the character. The helmet was the biggest part of the job and I used a lot of surface modelling techniques with spline curves and also poly-modelling for the small parts. While making the hi-res. model I also created a low poly model of the whole body.

Texturing
Textures are mainly from real images and I mixed elephant skin and a wood texture to form the facial skin (4). I prepared different channels in order to give a realistic look: bump, specular, transparency and self lighting. This process involved some tests like an Sub Surface Scattering shader test, the setting of the transparence... When coming to make the shader of the visor I had trouble with the refraction. As you know, the helmet is supposed to be like an aquarium, filled with water but the render of the face had too much distortion and the Brachoides looked very fat so I lowered the refraction index of the water. In a way it helps the creature to correctly see the world!
Lighting

To achieve the illusion of real materials I came to choose a Global Illumination render and an HDR lighting. I painted 2 images: a 2D detailed background made from scratch (5) and a blurry small panoramic picture. The lightning of the scene was made with 4 lights plus the HDR image illumination. I placed a strong backlight and three secondary lights on the edges of the visor.

The final render was very long and took hours to do but I'm rather satisfied with the look of the skin. During the overall process I used the CG forums a lot. It helped me to get this picture to look better, so thank you all! Colour correction and retouches were done in Photoshop. This mainly included the bug on the visor, depth of field and glow effects (6).

Portfolio examples
Warrior Monk
by Norbert Fuchs

Concept
The idea was to create a nearly photoreal 3D character. Why a Shaolin monk? Because I’m interested in martial arts (especially Shaolin gongfu).
Modelling
First I needed good reference pictures about monks and the temple before I could begin to model the character and the environment. After I decided about the monk's pose I began to model the head. (Using two reference pictures of a Chinese man). When the head was finished I moved onto the body. There are some mistakes I made (anatomy) but they don't show up on the final image because of the pose and camera angle.

The next step was to create the warrior's clothing. First I wanted to use cloth simulation, but it would be too heavy for my hardware and I did not plan to make any animation just a still image, so I modelled all the cloth by hand (1).
After the whole body was completed and positioned, I modelled the pants and robes around the character. (The socks were part of the body model). After modelling the monk the next task was to create the environment which is not too complicated. It's the temple's graveyard (or something similar to it). The background elements are the same with different sizes and textures, just like the ground stones.

Texturing
After finishing the modelling I began the UV mapping. The character's textures were painted in 2k resolution and there are five of them: head (2) body front (3), back, arms and hands. The eyeballs were done in 1k res. Eyebrows are painted as well (they aren't the best looking parts of the textures though...). The bump and speculars were made from the colour maps (by desaturating and tweaking the contrast). The clothes are also 2k. They all have the main base texture and I just added different "wrinkles" for each (4). (And different colours of course). For the environment I used brickwall and stone textures as a base and painted them for my needs (added dirt, some sian text...). I put a plane in the far background and gave it a nice temple photo as texture (because of the depth of field it looks good in the final piece).
Lighting
Lighting is always challenging and I decided to use Global Illumination as well as six light sources in the scene (5). There is one keylight (the Sun) using Raytraced shadows and the others are fill and rim lights to detach the warrior from the background and one light to add a nice specular to the eyes. And there is Global illumination of course.

Post Process
After rendering I opened Photoshop and painted the eye's "tear-duct" area. I then made some colour correction and added the zdepth effect using the rendered scene zdepth image and finally some noise (6).
Templar Knight
by Fredrik Alfredsson

Concept
In this picture, a lone Templar is standing guard outside a prison where an important Saracen leader is being held captured. I was first inspired to create a picture featuring the Knights Templar after reading some fascinating books that sparked my interest. The Templars were a monastic military order with the primary mission to protect Christian pilgrims traveling to the Holy Land, and as warriors they were feared and respected, considered to be the very elite of their kind. I tried to make my knight look as if he knew this, a knight that did not fear anything.

Modelling
Since my skills in rigging and animation are very limited, I did only a very basic rig on a proxy model of the knight to try out some different poses. Once decided, I used that mesh as a base to model the final character pretty much straight in the final pose, since I never had any intentions of animating it. The actual modelling was pretty straightforward, using the regular modelling tools and pulling vertices around until I was satisfied. The cloak for example was made by extending a few subpatched polygons into the right shape around the body, then splitting up polygons and pulling those around to create the biggest wrinkles. The smaller wrinkles were done in the texture with the help of a photograph of wrinkled cloth (1).

The prison mesh was also kept as simple as possible, little more than a few boxes actually (2). The wall textures were created by combining various photos of concrete and stone, with some painted details and variations added (3). The prisoner was quickly made by modifying the knights mesh and textures. I used a low camera to make the knight look more powerful and intimidating. Naturally this needed a detailed ground that could handle a closeup. To achieve this I modelled a simple ground plane with just some small elevational differences and created two rather simple ground textures, one with thicker looking sand and gravel, and
one cleaner, more compact sand that I used to blend in where people would have been walking a lot. Then I modelled some very simple stones that I randomly cloned in all over the scene. The rest were done in post, using Photoshop to paint in larger stones and some dry weed and flowers (4). I also took my camera and went looking for a place with similar ground as I wanted in my image, and photographed it in roughly the same height and angle as my virtual camera in the scene. This photo could then be blended in over the render to add realistic details and variations that are very time consuming to do by hand (5).
Rendering
The light rig consists of mainly arealights with soft shadows (6). Bounce light was simulated by placing extra lights with distance falloff around the scene where needed. Global Illumination was used only to render a final ambient occlusion pass, applied as a multiply layer in post.

The prison needed no such pass since the simple geometry made it easy to paint this effect by hand in Photoshop. Most metal surfaces use simple spherical reflection to reduce render time and remove the need for a more detailed environment. When used correctly, faked reflections can often look better than actual Raytraced reflections since you can have greater control over what should be reflected. I did however render one pass with Raytraced reflections for the chainmail to make it properly reflect the white cloak. I'm a huge fan of splitting up projects into different passes and composite them in Photoshop for greater control of the end result, and I did so to a little extent in this project as well.

I tried to keep it as simple as possible, so once I was done with the image in Lightwave, I rendered out the most important lights area of effect (by turning off all textures and render only one light at a time), and used those as masks in Photoshop to change only those lights colour on the already rendered image. It doesn't give you as much control as properly splitting up all lights into separate passes, but it let me do the subtle changes I needed without very much work.

Portfolio examples
Bill Murray
by PiSONG

Concept
Whenever you start a project, no matter how complex or simple it may be, you will always guarantee a smoother ride if you do a little pre-planning before you start the work. Having just watched two Bill Murray films, and getting to know his features, mannerisms and characteristics intimately, I had a confident mental image of what I wanted to achieve. Sometimes I find it’s best when creating caricatures, not to use any reference when you first start the project. Now before I lose you and you start thinking “eh” let me explain. Creating a successful caricature is more about whether or not the design “feels” right, than whether it merely “looks” right. A caricature should be about 40% appearance, and 60% feeling. Don’t just focus on what the subject looks like, or their physical features. Try to capture their personality, and what sort of person they are inside and out. In the example of Bill Murray, I knew instantly I wanted to convey him as lazy, physically out of shape, and a layabout. Not only capturing these things but exaggerating and building upon them to strengthen the overall caricature. Now here is why I told you not to start out using references. When we use references we are often too focused on just the physical appearance, not the personality as mentioned above. By starting the design without reference, you are creating the character as you see them (1). Not as the photographer, airbrush artist, or makeup artist did. After going over all these things, and putting a little mental power behind the design, Luxology’s Modo was fired up.

Modelling
The Bill Murray model was created with a tried and tested method PiSONG DESIGN has used for years. Start with a sphere for the eyeball (2), place a 6 to 8 sided disc around the eyeball, extend the vertices out and create the shape of the eyelid (3). Many people will tell you to be overly technical with this part of the design, but I won’t. 3D modelling doesn’t need to be technical, and I won’t tell you it is. The nose (4 & 5), lips and chin
region were created with the exact same method, extending the vertices in the appropriate directions and carefully massaging the points in the model to achieve a nice flow and sculptured shape. Once the face was close to completion, the next task was the ears. For this model, the ears were “Frankensteined” off an older model and after a few adjustments were welded onto the sides of the head (6). I’m a firm believer in shortcuts. If you can find them, save yourself the hassle and do it. I won’t hold it against you.

Bill Murray’s body was created pretty quickly (7). Using primitives as starting points the body was sculpted using the move, rotate, and stretch tools. Just like a traditional artist sketches character designs using primitive shapes. The body probably only took an hour at most, as it wasn’t the selling point of the model. It was there to compliment the head, while the head did all the talking (pun intended). Probably the trickiest part of the body was creating the hands. Hands are never easy; even when you have done them a million times. However, I have managed to find what I believe to be the most efficient way of creating them. In Bill Murray’s case, a low poly unpatched box was used. The box was divided up evenly and the top end was bevelled where the fingers would be pulled out from. The box was then shaped and the points massaged until a palm started to emerge. The fingers were then extended out from the top of the box and after a few knife cuts where the knuckles would be formed and more point massage, the hands took shape.

**Texturing**

The model was textured using Lightwave’s procedural textures with several localized image maps over the top for some of the smaller details. The process of creating the texturals was a simple task of trial and error. I started out by creating the skin first (8). With a flat shade of flesh tone applied to his skin, I hit render. I made several adjustments to the specularity, translucency, gloss, and diffuse, then hit render again. This process went on and on for hours, until I had created a completely custom skin surface made entirely out of procedural textures (10). The main points that really “make” the surface are the use of gradients and incisions on the diffuse, luminosity (9), reflection, and specularity channels of the surface. This allows a fine level of control over how your surface reacts to specific lighting set-ups. Naturally this always requires further tweaking once you start tweaking out the lighting rig itself.
Lighting

Having the model and textures finished the next step was to create the lighting setup. This was done in the very same way you build a house of cards; by starting with a strong foundation and building it from the ground up. That way every light, every setting, and every aspect of the scene serves a purpose and directly relates to the other elements in the scene, this creating a balance. The first thing I did was a trick I figured out two years ago while working on a large project that required an atmosphere without an atmosphere. I created a "wave" (11) out of polygons and imported it into the scene. This is a curved piece of geometry that will sit behind the character and creates not only a floor for him to stand on, but a wall behind him too. It serves several important purposes, the first being the background, by having the floor plane and the back wall built into the one piece of geometry it allows you to have a continuous atmosphere without a segment or horizon line where the sky (or wall) meets the ground. The second purpose it serves is to give the radiosity of the lights in the scene something to bounce off. The third is if you apply a slight amount of luminosity to the wave's surface properties, it will actually illuminate the scene with its colour providing you have radiosity in your scene. I got pretty lucky on the scene setup, and didn't have to spend too long tweaking lighting settings and placements, as with careful planning and a strong sense of direction, it all came together, and after the first or second render the image was complete (12).

Portfolio examples
My Uncle Cthulhu
By Fred Bastide

Modelling
After the usual sketching process, I made a rough plasticine model, which was photographed from the front and side. The pictures were Photoshop cleaned, and some adjustment was made to correct the lense distortion. The pictures were mapped onto planes in 3D Studio Max, and used as a guide to build the principal masses of the character. The model was essentially using the “extrude edge” method for the main parts, and the newly implemented modelling tool “extrude along spline” for some of the face tentacles.

I decided early on to model it directly with the arms crossed (1), as it would make no sense to skin a character. It would also permit me to be more precise with parts that interact, like fingers softly deforming the fat of the biceps, or contact of the forearm with the belly.

I've used a “push” modifier with negative values on a clone of the torso, to obtain a quick and perfectly adjusted base for the t-shirt. A similar method was used for the vest, completed with a shell modifier to give it
some thickness. Details like “badges” where added with lofted star shaped splines (2). My primary idea was to have a lot of them, but all those shiny objects detracted from the character too much, so I kept only two of them. The silver jewels were made from a distorted torus, cloned along a spline with the spacing tool. The chain was adjusted with an ffd deformer box to give an illusion of weight, and make some minor adjustments (3).

The same procedure was used for the teeth of the zip, spaced along a spline at the edge of the jacket. Finally, I added another ffd box to a selection of all the objects related to the character, giving him a more natural posture.

Texturing
All maps are targas generated by the free and very practical plugin "exporter" which forms the base image. Fabric textures (4) were principally issued from high resolution pictures of my own clothes, directly scanned in. Once cleaned, I’ve mixed them with different maps to add some dirt and create a second-hand effect. My first idea was to use black leather for the vest, but that material does not provide enough contrast with the dark tonality of the background. I finally settled on a blue jean fabric, enhanced with a displacement map to add some thickness and give a kind of stuffed feeling to it.

The skin texture (5) was 90% Photoshop painted. Some details like little spots came from orchid pictures, and from high resolution pictures of vegetables. I used a percentage of photos with painted texture, to break the “handmade” aspect of a Photoshop work. Finally, adjustments were made with ZBrush, to correct overlapping problems, reinforce shadows and lighten bumped parts, to give more volume to the mesh. It could be useful to add some procedural material mixed with the bitmap, to homogenise the surface and correct some unwrap problems. In this case, a mix of two cellular with very small values was added on the bump map, to have more detail on the high resolution render. To decrease render time, the refraction was faked for all the little metal pieces, using only an HDRI map as environment, without Raytracing.
Rendering

I've used the Vray rendering engine, which gives a quick and realistic Global Illumination, with reasonable render times (6). Due to CPU and memory limitations, I had to give up the displacement mapping on the head of the character, and the Vray sub surface scattering, which was finally faked with a fall off shader effect. The scene was lit with two direct spots, and refractions on slimy parts was enhanced with white boxes, placed around the character.
Arabian Warrior Horse
by Khalid Abdulla Al-Muharraqi

Concept
The most important part of any project is to come up with the right idea. The artist should spend most of his time developing the right direction to guide his production and he should always have a plan before starting any work, otherwise he might not be able to complete it or it might take longer than needed. My main idea here was related to peace. With all the war and destruction that’s happening, I have symbolized the warrior horse as the war tool that was used to ride and destroy. However this hard shell has the need for a softer and gentler thing in its life. It meets an element of nature that moves in a soft and delicate way. It drives it away from the chaos of the war; for a second it forgets it’s purpose (1).
I started by getting the sketches to look the way I like. After you know what you want, it's time to look for reference photos. You shouldn't be shy to go through references, because that is the best way to get ideas, and modify them to look original. I was looking for two main things.

**Modelling**

One of the main problems that you will face with modelling a robot is, where to start? I prefer to start with the head, then work my way down. After a lot of practice I can say that the sub-patch modelling is one of the most enjoyable and easy to control modelling tools that I have ever used in the 3D world. You can almost do anything if you understand how it works. Of course you always have to centralise your objects in the centre of the world in the modeller to be able to use the symmetry tool at the bottom. A lot of the pieces in a robot are created from many other pieces that fit together to be one, like the hood of a car. I think the best way to do that is to build the overall mass as one, then add the segments that are needed to the area that you want to cut out. Once the points are in place, cut out the area and then paste it onto another layer (2).

**Texturing**

Once modelling is complete, it is the time to start applying some shaders. It's always a good idea to name your object, or even different pieces of your object in a convenient way so when you look for it, it would not be terribly hard to find. For example glass for glass or metal for metal. To me this is one of the most fun parts of the project. I love using Photoshop and I love using Lightwave. Maxon engineers and developers have created the best combination, and they also came up with Body Paint 3D. I was amazed at what this package can do and at once I was not afraid of making my own UVs. It is so organised and so interactive with Lightwave, I almost felt they are a part of each other (3). UV-design is as creative as modelling is; it is an art form that you will have to master. Some models might take hours and hours to make the right UVs, so you will have to do a lot of testing. With the neck section I wanted my texture paint to project itself on both sides. Therefore I have flattened out both sides of the polygons directly on top of each other, so now whenever I paint on one side, it reflects exactly onto the other side, Cool! Thus if there are more of the areas that you want to maintain the same look and if the geometry looks the same, this is a quick and accurate concept to follow. Great to use for cars, planes, animals etc.
After I have set up my UVs, I can now begin painting and in the following example we see I am painting my bump texture. In Body Paint you can see bump, specular, reflection and colour, but I wanted to see the black and white contrast for the bump maps directly on my object. You could do it the other way, it's just a matter of preference. After I have painted all the locations, as easily as I got into Body Paint, at the click of the button, the plugin from Maxon or the bridge, is still on stand by to transfer back all the updates that you have done with the UVs and automatically saves your images. Beautiful! I like to spend a lot of time here and I like to use all that I can and all that is necessary. One of the plugins that I suggest will make life better is FPrime from Worley Labs (4). You can see great feedback from your texturing. Starting with the bump map, I created scribbles that resemble scratches to start with and then I apply the UVs for bumps from Body Paint, after which I add procedural texture for clumping. When I think that the bump looks okay, I jump to the specularity and I use the procedural again to design the areas which would have specular highlights adding gloss and diffusing some areas. I have 4 levels of colours; 3 are procedural textures, each having a different pattern and size, and the final one is a gradient. This is the final coat that will change colour with the degree of the angle that you see the surface from; the more it tilts the more the colour will distort. After I have carefully fixed my services on to my object parts, I now have to think about the proper set-up of my object in the Lightwave layout (5).
Lighting

In this scene I have used 5 different lights, two point lights, two spot lights & one area light. Keep in mind that; it’s not a good idea to keep more than one shadow from one light source, unless you are in a room with a lot of artificial lights (6). Otherwise your scene will look very strange. You will have to go through a lot of adjustments to get the best results for the lighting. I have added the light in many different locations with different settings to get it where I like it, so take your time here when you are doing your project. Usually artists don’t give this area much attention, but I think it’s lighting that makes your scene look real or fake.
Captain of the Guard
by Eric Wilkerson

Concept
Each illustration starts from generating thumbnail sketches. For this painting ‘Captain of the Guard’ I had left over photo reference from old western book cover commissions lying around and decided to put it to use. I had been wanting to do a painting with a huge hologram in it ever since seeing the film Final Fantasy The Spirits Within. While creating abstract drawings I am thinking about mood, lighting, atmosphere, size relationships, composition and overall concept. I consider the story I am trying to tell in the image and remain conscious of
staying away from clichéd images. Not that a figure or figures staring into a hologram is original in Sci-Fi cover art but I thought I'd play with the idea. After producing some loose thumbnail sketches (1 & 2) I create a rough final drawing (3) as a guide for my next few steps. For me this stage is the most fun. Here I begin focusing on character and costume designs, architectural detail and other background elements. Depending on the illustration, machinery and other conceptual designs are all worked on as well.

Reference

Now that I have a fairly good idea what the composition and overall concept will be, I set out to find reference materials for the figure and environment. When I work in oil paint I usually end up building small scale models of objects that I don't feel comfortable making up as I paint. To make something look believable the lighting has to be acceptable. This is something that I just can't make up. When working digitally I decided to build small non detailed block models (4) in 3D Studio Max as a point of reference. In this case the background wall and foreground computer monitors were done in 3D Studio Max. The figure reference was obtained prior to the start of the illustration so it was more about working the environment around the figure. I don't always have it this way. Most times it is necessary to do a photo shoot of models and various other props before I begin painting. I referenced uniforms of military officers to find the appropriate look for the captain standing in front of the holograms. I knew that the creation of the holograms was going to be tough and I needed to find a good way of creating the effect. At first I tried it in 3D but ultimately ended up doing all the holograms in Photoshop. I studied screen shots from Final Fantasy since that was the look I was going for. I created them by first making and filling a shape then distorting and adjusting it to the correct angle. I then duplicated the shape multiple times, always adjusting the scale of each piece. Once I had the holograms finished I merged all the layers into a whole. Afterwards I duplicated the new layer and added a gaussian blur to the copy. This gave me a nice glow to set behind the original layer. All the rest of the hologram work was done the same way, just playing with opacity and distorting when necessary.
Painting

Before starting the final drawing, painting or modelling it is necessary for me to settle on a colour scheme for the painting. I decided the entire painting should be lit by the holograms in the room so it made my job easy to just take my preliminary sketch and play with hue and saturation adjustments until I found my hologram colour. Once I knew that I wanted a yellow-ish hue to the entire painting I needed to experiment some more. So by going to image/adjustments/variations (5), I was able to play with a variety of possible colour choices from yellow green, yellow orange etc.

When I've finished gathering my reference and worked out colour and value, all that is left is to complete a detailed final drawing from which to paint. Since my environment was a 3D model the only thing left to draw in was the figure. The figure drawing was done directly in Photoshop. I decided to crop a good portion of the illustration and zoom in on the figure and hologram. My sketch left much more room at the top for text but didn't really help to show the focus of the piece.

In the second semester of my sophomore year I was introduced to the Frank Reilly system of painting. This method taught me to paint with a controlled palette. Almost all my essential colours are pre-mixed palette. The values for each colour are broken up into a numerical system. From 10 to 0, value 9 being the lightest, value 1 being the darkest, with white and black as value 10/0. When I decided to do my work digitally I saw no reason to change that approach. I use Adobe Photoshop almost exclusively when doing digital painting. Not that it is better than other options, it's just my personal preference. I keep my digital controlled palette open in a separate window (6). My flesh tones, various colours and neutral greys are all close at hand (7 to 12). For painting the environment I first started off by creating a rough scratched metal texture in Photoshop. I then applied/ distorted/ stamp tool the texture all over the 3D model. This gives a nice enough metal look and gets rid of the smooth rendered look of the model. Other small details are added. Rust, chipped paint, computer panels etc. I constantly made changes as I went and tried to stay flexible as the painting was taking shape. This is what works for me. Regardless of medium or method of working, the end result is always the same if you know what you're doing. Since I use a controlled palette while doing work digitally it really doesn't matter to me if I use...
Painter or Photoshop. I tend to create an assortment of custom brushes that give me the results I’m happy with when using either program. I hope this gives someone just starting out a little better understanding of the stages of creating illustration, whether it be traditional or digital.

Portfolio examples
Modelling
The design of the face was inspired by Spinnefinger; I built the model under 3D Studio Max 5.1 using "low facing" with the "edit polygon". Then, to subdivide the whole, each part of the body was built one by one in a separate file (hand, chest, head, etc.) in order to polish the "modelling". The process was done in such manner in order to avoid heavy scenes. Once the "modelling" was finished, it was necessary to assemble the whole to return to an animated film (skin + character studio).

The setting/set is entirely modelling; I also used the "edit poly" and "extrudes along spline" concerning the tree. Each vegetal element was then moved and placed according to the framework.

Texturing
I spent most of my time on modelling the texture (1 & 2); it was undeniably the longest process. It took time mainly because the mecha shape was extremely complex. One of the difficulties that I had to face was to unfold each "UVW (texporter)". I painted each texture by using the software Photoshop through some "crossover" methods. For instance, scratches (3) were painted by using the lasso. Just to give you an idea, not less than fifty "textures" have been used to finalize the mecha shape.
I also used Photoshop to paint the tree (4 & 5) in the background. In order to give some relief to that tree, the toolkit "displacement" was used. I had to put some opacity effects on the ferns; otherwise it would have been too complicated to model it. The other plants/vegetal on the picture have been scanned from real plants (6), purchased in a florist store and retouched thereafter.

**Lighting**

Lighting process is definitely my favourite job. Most of this work has been made by utilizing the software Vray to create a "total illumination effect" as well as "the scanline tool" regarding the layers. One very powerful and useful tool that has been used, concerned the Global Illumination Vray toolkit (7). It enabled attenuate lighting from complex scenes and gave shade effects with a very good quality in terms of set. The scene is composed of about ten lights (Vraylight, omni). In general, I like working on specific and very located lights, which are part of the special effects that I really enjoy dealing with!

Calculation & implementation concerning the character have been done separately from the rest. There are approximately 10 "layers" that composed this scene. The consequence was that these layers gave me more flexibility in my work, especially with the "compositing" (shake). Lastly, the depth of field was made up with Z layers, which were also used for the "fog" in the final compositing.
Portfolio examples
Cohabitation is one of over 100 images I’m developing for my book project “Otherworlds” and the inspiration for the image originates from the supporting storyline. Overall, my fascination with creating alternate worlds and fantastic scenes is undying; I simply don’t have enough time in my day to put all the ideas I have down on paper. Within the story there are a large variety of unique locations that help describe the overall “Otherworlds” experience; cohabitation is one of those locations. Without giving too much away, this painting depicts the slow but persistent integration of 2 “alien races” into the native landscape. This particular painting illustrates the early stages of the co-existence or “co-habitation” of the landscape by the 3 races. In the paintings to follow the 3 civilizations become more distinct and the natives of this world begin to be overrun by the visiting creatures.

Much of the imagery for the book utilizes a darker more brooding palette that is fairly rich and saturated. However, in this part of the story I wanted to explore a cool tertiary palette that, I believe, will help enhance the colour wave throughout the story. On the colour wave subject; to help enhance the emotional experience and to create defined and identifiable locations for the reader, I developed a “colour wave” or palette that works with the rhythm of the storytelling. Additionally, since the landscape changes over time I choose to start with a controlled semi-analogous palette that would allow me to build upon as the changes in the landscape occurred. As I’ve stated in other tutorials, my approach does tend to vary from painting to painting, it really depends on
how confident I am with the subject matter I’m dealing with and how much time is available. I rarely begin my process with just line art; I feel more comfortable working with value; defining overall shapes and volume as I go. Approaching my thumbnails as quick value sketches helps me to see the composition and overall layout of the piece very quickly, as well as explore lighting solutions. In the case of ‘Cohabitation’ I created a few thumbnails in Corel Painter using the ‘grainy oil brush’ and a few pastel brushes in greyscale only. I initially start with basic shapes and begin experimenting with the type of architecture I think best describes the first civilization that inhabits this part of the world. Since the piece is ultimately being created to help me visualize the terrain and the changes that will occur throughout the story, I choose not to approach the camera angle from an overly dramatic point of view. I want this concept painting to be functional and more of a description of the architecture, roadway system, and level of technology and less of a glamour shot or ‘illustration. In the value sketch (1) I begin to define scale and my initial thoughts for the vehicles, especially the spaceships or ‘air vehicles. The piece still in its infancy, I go through a few iterations to help clarify my vision.

Colour Sketch
Once I feel fairly confident with my approach, the next step for me at this point is usually the colour sketch. I’m still not completely sold on the overall architecture, layout, and composition, but I feel it’s a good time for me to explore some colour solutions. I then bring the image into Photoshop, create a new layer, set to overlay, and begin painting in my colour. My focus is to further define the lighting, the temperature of the light source, and the overall key of the environment. With only an initial idea in mind I mix some warm ochre’s and burnt sienna and paint into my value sketch. I decided I want to have the sun reflecting off the building and I want the building to be warm, slightly offsetting the cooler sky.

Painting
I now have a general idea of where I want to go with the image, although many questions still need to be answered. Since I like the overall look I was getting in Painter, I move back to that painting package and get to work. I decide that, overall, even the base architecture is too ordinary or of “this world” and needs to appear more unique. I find the distant buildings in my initial sketch interesting and decide to build on that foundation by introducing an industrial influence. Next, I decide to
further develop the architecture of the other civilizations, keeping in mind that, at this point in the story, it needs to be subtle. The additional architecture will also give me the opportunity to resolve the somewhat stale composition I currently have. To offset the angled approach of the building in the scene, I introduce rounded, dome shape architecture as well as platforms that help to further define depth. The palette still doesn't feel quite right to me so I decide to continue with the industrial theme and push the saturation of colour down a bit. Next, I move the overall colour key away from the warm colours I currently have and push it a bit more towards the blue family, still maintaining some warmth on the buildings. A focal point (2) is beginning to take shape and the viewer's eye is now successfully being lead towards the "hot spot" in the piece. While an established focal point is beginning to take shape, I think it still needs to be defined further. Next, I bring the image back into Photoshop for some overall image adjustment. I create a hue saturation adjustment layer and begin to mask out the areas I don't want the adjustment layer to affect. Effectively, I create a defined focal point with my mask and begin pulling up the saturation and light to help further effect the unmasked area. Every successful painting must have a focal point, it can be well defined or it can be subtle, it helps the viewer's eye rest on the major point of interest in the piece. Lack of focal point is the biggest mistake I see made by students and professionals alike. A painting should do what the human eye naturally does; focus on something specific in the surrounding world for any given moment.

**Detail**

Adding the details in a painting can be the coolest part of the creative process, since it's when the piece really comes to life, however, it can also be the most labour intensive and mundane. Now that I have a clear view of the direction for "Cohabitation" defining the details is going to be the fun part. Still in Photoshop and working on my base layer I begin adding more technology based architecture (3) thus subtly defining the third civilization. Still, I feel the composition could use an additional boost so, on a new layer, I add a technology based tower, balancing out the composition. Finally, it's time to populate the world and since the storyline calls for a fairly populated city I quickly paint in crowds of people on the platforms leading into the city (4)... and all done.

**Portfolio examples**

![Portfolio example image]
Wail Evolution
by Jesse Sandifer

Concept
The purpose of this project was to create something that was part machine and part flesh. Since this was my first serious creature, I wanted it to really challenge me. The design entailed a formidable beast that could scream or "wail" at incredible decibel levels. The intent was to sonically stun or even destroy his victims with his wail. The design also incorporated chemical agents that were stored in his forearms which would spray from the palm area of his hands to finish off his enemies.

Modelling
The first step in creating this creature was to do an initial first pass on the entire design. This process is commonly called creating a proxy model (1). It's basically a super simple representation of the design. Proxies help to finalize proportions and scale, and sometimes design issues. It's very important in my process to nail this step down first, and then proceed to the final hi-res. modelling where all the detailing and serious hours of work take place.
My favourite modelling technique is constructing the model with a semi-low resolution editable poly and stacking a meshsmooth modifier on top to create the smoothed hi-res. result. This method is great for doing organic surfaces like the fleshy areas of the "Wall" but also, it's handy for creating the mechanical surfaces. I like to have tight rounded corners and avoid harsh, sharp edges that sometimes make a model look unconvincing. I'll usually take the proxy model, copy it, and start hacking away into the geometry to create the hi-res. mesh. This way, I can have the proxy underneath it so I can still reference the shape. It's really like taking a hunk of clay and working it bit by bit. Also, it's important that I set up an organized mesh for a couple of reasons:

(1) Unwrapping the mesh for custom texturing – having my mesh with clean edgeloops and mostly quads is crucial for when I start laying out the UV's and (2) animating this model – having a clean mesh topology only makes the rigging and skinning process easier. As far as bringing the model to its final state, I keep adding necessary edgeloops, cutting into the mesh, pushing and pulling vertices, and constantly rotating my 3D view of the "Wall" to be sure that it looks right from all directions (2). The crater was created with a meshsmoothed poly and the rocks were randomly moved, rotated, and tweaked to fit into the final composition.

**Texturing**

This was my first real attempt to do texturing on a personal project, so it was quite a learning experience for me. I knew the look I was going for on the flesh (3) and I knew I was going to have to unwrap the model in many areas to create the textures I wanted. First step was to start UV layout or "unwrapping". I blocked out different areas of the body into chunks, i.e. the head, arms, fingers, upper legs, and lower legs. Instead of using an automatic unwrap process, which splits up the UV coordinates into a bunch of pieces based on an angular threshold, I decided to use a different method. First I use a square image map that has a tiling of different colours and rows of numbers so I can see what areas are stretching and ripping in the UV coordinates. So then I select the faces only on the right side of the head and apply a square planar map to them. Then I'll collapse the mesh, hide those mapped faces so I don't accidentally select them again, and repeat the planar mapping to all the other areas. Then I stack an unwrap UVW modifier on the editable poly, click edit, and stitch everything together while paying close attention to how the map looks altogether on the mesh. Then once
I'm happy with that, I'll bring a black and white jpg of the UV layout into Photoshop where I begin to paint the textures. Most of my texturing was a conglomeration of dodging, burning, image mapping, tiling correction, and some hand painting for wrinkles and cracks and such (3 & 4). I then brought the finished texture map into the appropriate channels in the individual material slots in 3D Studio Max. I used diffuse, specular, glossiness, bump, reflection, and translucency maps. The reflections on the armour were created with an HDRI environment. The crater itself used displacement for the dirt and rubble. Procedural textures with mixes of image maps were used for the large rocks and boulders (5).

**Lighting**

I really wanted some dramatic night lighting in the scene to highlight the “Wail” and bring some ferocity to him. I used a Global Illumination solution with Vray for the general lighting and I applied the volume light (6) in Photoshop. The sky was also done in post and composed from some stock sky imagery and lots of hand painted work to vamp up the colouring, clouds and intensity.

**Composition**

Naturally, I wanted the composition of this image to bring focus to the “Wail” itself. It also needed some kind of action and movement. With the intent of keeping my main subject away from dead centre, I placed the “Wail’s” head at the upper left third of the shot. I decided to tilt the camera a bit and have the streak of volume light shoot right towards the “Wail” with the intent of leading the viewer’s eye directly to the main object. At the centre of the image, I composited in some blurry people and a little bit of flying dirt.
Small Bot
by Andrey Yamkovoy

Modeling
I started making the model of a robot by creating simple boxes which were standard primitives. I created 6 boxes, one for head, two for hands, two for feet and the biggest one for body. After I changed them by adding some new vertices and moving them to give the different robot parts the shapes I wanted, I created several bearings with the help of cylinders. I used extrude and bevel modifiers to give them the right form. With these cylinders I connected all the body parts. The next step was to create some smaller boxes for Bot's fingers. I used previous operations (adding new vertices and moving them) for creating big flat mechanical fingers. Palms were created with two boxes too, so I moved vertices to give them circular shapes from one side. The last part of the modelling was to create legs, which I had made using the slice plane modifier on the box surface, followed by some scaling, and our legs have sharp corners and some hollows for adding the bearings. Seams on the legs were created with the slice plane function and pulling the verts into the leg just a little. I especially didn't add a lot of detail into this robot just because the main idea was to create a simple shaped character.

To create some space in the scene a small platform was added for the worker robot. The model is also simple, comprising of a big cylinder which was modified with the help of tessellate and extrusions. Rails are just a spline as well as the wires. I used Reactor to simulate sagging for a realistic look. The last step of modelling the scene was to add some background. To avoid overloading the composition I used a simple plane with a bend modifier to create a cylindrical form. Then I used the Gribble plugin to add some more detail. For a better result I decided to use the meshsmooth modifier for all the robot parts except the bearings (1). The background remained constant too with no need to add smoothness due to the blurring.
Lighting
For lighting I decided to use Global Illumination (2), because I like any sci-fi, especially the characters, with good Global Illumination. So I added skylight for Global Illumination with white colour. The Global Illumination multiplier was set to 1.5 to create a bright and well lit scene. One directed spotlight was added to simulate sunlight from above. I used a spotlight with a multiplier of 1 for strong and bright light. Also a white colour was chosen for the spotlight so as not to change the scene's colours or add an artificial effect. In the Global Illumination settings I turned off bounces with the value of 1. This was done to prevent more reflected light on the platform. I have come to a conclusion that sci-fi scenes are better to make with sharp shadows so I used Raytraced shadows to emphasize all the forms and details of the robot.

fig 2

fig 3
Texturing

Texturing took the biggest part of the time spent on this work. First question that cropped up was: What colour should this robot be? After some time I decided to make him yellow (3) to emphasize him and to give him a positive and energetic look. I used an old rusted and dirty metallic material with blurred reflections for all the bearings to give them a very used look (4). Background was set to just solid, a blue colour to help accentuate the robot and set him apart from the background. Also, the blue colour conveys a sensation of space and a big area (5). Some dirt and rust were then added to the robot which helped me to make him look less unreal and new.

The platform also got its fair share of dirt and rust as it is also metallic. All textures had to be of a high enough resolution and detailed, because I was making this robot for a poster for my room at first. After applying all the textures to the objects with the box mapping, I was satisfied with the result.
Concept
I've always loved ancient architecture, so I decided to place a very old, yet living civilisation in an off world environment, and the inspiration for this scene came from the Hanging Gardens of Babylon and Aztec architecture.

Modelling
I started out by going through a lot of reference shots of old temples, and picked up some ideas on how I wanted the tower to look. With Cinema 4D, I then used box modelling to create the base shape for the tower. Once that was done, I used the extrude tools to cut out some "windows" in the structure. These are not exactly real windows, considering the size, but pure decoration to give the tower a little more detail. I also made a few thin gaps, to give room for some tower lights later on (1).
Last I added the fake stairs and imported the model into Bryce5. The reason for using Bryce for this scene is because of the jungle. Xfrog trees are great, but with the amount of trees, the polycount would be extreme. Once imported, I positioned the camera and placed a few terrain objects beneath the tower. I also added another tower further away from the camera. I then used a number of tree objects and placed them on the balconies, as well as around the towers (2).

**Texturing**

Since the towers aren’t supposed to be man-made structures, I didn’t want to use a simple stone surface (3), but more a mix between concrete (4) and metal. I blended a couple of concrete photographic textures and gave them a fairly high specularity level to reflect some of the atmosphere. I used a dirt map for cracks and bumps to add to the worn, decayed look. I also blended a few rock textures for the terrains (5).

**Lighting & Postwork**

My plans were to create a majestic sunset and have the sunlight coming in from the lower left, without making the scene too dark to see the entire structure properly. For this I used a number of red, white and blue radial lights (omnis). I used 4 red/white lights coming in from the left, where the main lightsource/sun is located, 1 faint white light just in front of the tower, and 1 blue light at the far right, to keep the right side of the tower visible. I made 4 different renders, each with a different atmosphere, and used a neutral backdrop on all of the renders.

I then opened up Photoshop, and placed the 4 renders as separate layers, which I then blended together to get the right base to start working with. When working in Photoshop, I often use colour corrections, and different blend modes to achieve the proper colouring. Once I was satisfied with the base, I started to piece together the sky, which is made from a number of sky photos, as well as painting. I also wanted to show a glimpse of the space surrounding the planet, so I used some good old filters for some stars and gas clouds. I then used the ellipse tool, to draw a couple of planets, in which I applied two deformed concrete textures and a number of layers, to give them a sense of an atmosphere. Once done, I used the tablet to draw a number of trees on top of the existing ones, which I wasn’t really satisfied with. I added some details to the towers, such as dirt and gaps, and also a hole at the bottom, that gives a hint on how it looks inside.
Looking a little deserted, I decided to add a number of tiny window lights, to make the place look inhabited. The lights were done by drawing some straight bright-coloured lines along some parts of the structures, and then simply use a thin eraser tool to cut gaps in the lines. Finally I duplicated the layer, erased some of the windows on that layer, and added outer glow so that some windows would shine slightly brighter than others (6).
Armageddon
by Siku

Concept
My pencil sketch for this piece was elaborate and a piece of art in its own right. This was where 70% of the work was done and unlike much of my work I had no idea what I wanted to achieve (1). I thought to myself, "If this doesn't work, at least I'll get a nice pencil drawing out of it". In Photoshop I then experimented with a renaissance style wash and created several separate layers of masked colour components for the sky, grass, atmosphere/people and Jesus Christ (2 to 5). By now, I knew what I wanted to do!
Work in Progress
It was important that the impact of the pencil was kept virtually pristine, so my approach here was watercolour technique with heavy airbrushing. There are hundreds of people here and highlighting "telling" parts of their anatomy completes the picture in the mind of the viewer that way, the painting keeps its freshness.

Jesus had to have an "other-worldly" look and it took some time for me to fashion the right technique. In the end, the luminous layer in Photoshop carefully matched over a specified layer produced the blinding light.

Sometimes we see bright lights in paintings and the core of the light is pure white. But as a child, I sometimes foolishly looked directly at the sun unaided and noticed a blue shimmering hue at the core of the blinding light... this was what I recreated here.

Portfolio examples
Beast Mistress
by Marco Siegel
Concept
First steps on all of my images is to create several different layers in Photoshop and start painting the objects. I always try to use as many layers as needed, which allows me to move the objects and play around with the composition, but this tends to only work on the early stages of the image. In most cases I don’t spend time on doing sketches/lineart.

I started by painting the wave first (1) but didn’t have any idea what else there should be. Most of my good ideas come during work so I didn’t worry much about it and finished the wave. Shortly after this I came up with the idea of creating some gigantic sea snakes hunting down a ship. With this new idea I created a couple of
new layers, grabbed some custom brushes and started to scribble down some dynamic looking snakes (2). The ship was painted right after the sketchy looking snakes. To make it look more agile I gave it more draught than a normal ship would have. This perhaps makes it less realistic but as it's just a fantasy image any discussions about realism seem to be a bit out of place. Now the missing background gets blocked in (2). I always use some blurry custom brushes for this while details get added later with some hard edged brushes. After the base work was finished the detail work started. Details on the ship and hills at the background (3) were mainly done with a conventional hard edged brush. Things like the splashy waves can also be done this way but it saves you a lot of time if you spend some time creating your own custom brushes. After all the detail had been added, I spent the remainder of my time on finishing up the colours and lighting. The whole process is a bit like doing airbrushing and/or texturing 3D objects... first you're "constructing" the picture and later colours and lights are added. Well it might be not the usual way for others but most of my images get worked out this way.
**Jaco**

by Patrick Beaulieu

**Concept**

The style of Jaco is based on another character I've done before called Freaky Bird. The Freaky Bird character is a kind of guideline for me, a style I want to evolve with my art, along the same lines, creating additional characters, funny and alive, just like my brand new character Jaco I will normally think of an idea and then roughly sketch it a few times (1). Once I'm happy with the idea I can start the creation process. For Jaco, I used a sketch to begin the modelling. I usually draw sketches of my characters, and write down ideas and I'm always thinking about a new project. Some projects are very established, with designs and storyboards, others are totally improvised.
Modelling
The modelling is the easiest part of my work because my modelling is simple in the sense that it's a cartoon style, and not as complex as modelling something realistic. My principal problem is to create something that resembles my sketch. The transition between 2D to 3D is not always easy. All we can do is spend more time on it until it's right. I just started the model of Jaco with no special tricks, just creating something clean, offering the possibility of being animated one day. During the modelling I adjust some things like the proportion and add some little detail in the design but the initial idea stays the same. I did tests before starting the wing, a test with shag fur/hairst and another test with the modelling of each feather. These two ideas were too intensive for the scene so I decided to just use planes for the feathers.

Lighting
I started the lighting with a kind of dome light using 10 lights with a low intensity. Then I added 3 lights (key Light, fill light, and back light) and the first lighting pass was done. Now as for the choice of a colour pallet, I generally work with rather flat colours and a lot of contrast. I do tests and look for the best option to get the feeling I want. After I've made my choice of colours, applied the shader and put a texture on Jaco, it's time to create the fur! I used shag hair to create the fur on the back of the head and on the back of the body of Jaco. Creating fur was a long process where I needed to tweak many parameters to get the results I wanted. For Jaco I just wanted to have a shiny white look with a really soft look. After the hair was finished, I made another pass to adjust the lighting for the fur. The light should be done with great care to get a good result and give an atmosphere to the scene and give a more realistic feel.

Portfolio examples
Red Beard
By André Holzmeister

Concept
The great and dangerous pirate Red Beard is a short movie that I’m working on, but due to the large amount of commercial work I’m doing lately it’s been frozen in my hard drive for quite a while. I will try hard to finish it this year.

At first, I wanted to create a simple character for the short and was planning him to speak through his moustache, instead of his mouth. He was supposed to have one hand and one hook, but the desire to make him more comical made me decide to give him two hooks and no hand at all, which could prompt lots of gags in the film. The parrot is a very important character, because he is the real dangerous and evil guy here. He commands the Pirate. The story takes place in the old Caribbean seas and is a comic film.

I decided to use 3D Studio Max and FinalRender to produce this film.
Modelling
I was trying to achieve a clay look for this film, so the character was modelled with that in mind (1). Everything had to look as if it's made of clay and to do this you need to model every piece of the character separately and bind them together like you would do with a real clay model. The control cage for this guy is really simple and does the job. After I subdivided the mesh I used a noise modifier to give some variation on the surface of the character to achieve the clay look (2), and used a similar treatment for the parrot.

The set is a very heavy group of junk and stuff that is found in the hulls of most pirate ships so there's chains, ropes, canons, canon balls, and of course a load of shiny treasure (3). Everything was supposed to look as though it was made of clay, but during the process I decided to use some textures like the wood of the walls, and the coins and treasure which ended looking better the way they do now. I took a lot of time to model all of the stuff in this scene and in the end it was really labour intensive for my computer, an athlon 2600+ 1Gig Ram and geforce FX5700.
Lighting
I decided to use FinalRender for the lighting, because I wanted to use the indirect lighting look you get from a dark basement lit by a shelter window. There is a spot light to simulate the Sun but I didn’t use direct light because the spot projector light is more suitable even though it was not correct. There is an omni light outside near the canon to create the lighting in that part of the set, and another omni in the foreground to light the areas near the camera. I added a backlight for the character to set him apart from the background, a little fake but functional (5). After this set-up, I just tweaked a lot of the Final Render parameters for the Global Illumination to work as I wanted. This part was really important in the process of achieving the clay look I needed. The clay shader for the character is a mix material, that uses an inverse bump of a big cellular procedural with a lot of sub noises and also procedural maps with a solid colour for every part of the character. Same thing was used for the parrot and some of the clay looking objects in the set. The wood material is a texture I made from some of the default wood maps that come with 3D Studio Max, but I tweak them a lot in Photoshop to make a cartoon like wood. For the treasure I used a raytracing reflection that took forever to render! I used Photoshop to colour correct the image, a little contrast and some overlayed backlight layers that I generated in 3D Studio Max. I also did the depth of field in Photoshop, I got the Z-depth (6) as a grey scale image and used the colour range selection of this layer to blur the pirate image.

Portfolio examples
The Family
By Francisco Ferriz

Concept
This character composition begins as a series of sketches done for our new graphic design image. At the beginning the main character was the bull (1), which later also turns into a cow, a cow which eventually became the protagonist of our project. It is a design started with sketches using pencil and paper, and all characters were thought of as a design exercise, not as a modelling exercise. They are deliberately simple, concentrating on a visual impact. They want to be different, want people to like them and they were designed under this premise.

Each one of these characters has been designed separately, trying to keep the same design style for all of them. Each one of them was designed for a different scene and only at last, when we had enough characters, did we think about creating this image, of a family portrait. Once the scene was composed, we chose a zoom lens to flatten the shapes of the characters and so that we could accentuate the cartoon effect. Also the camera was set up above the characters, because the lower it was, the more aggressive they looked.
Modelling
All scene elements have been created using 3D Studio Max 5, and modelled using the edit mesh modifier. Depending on the design we either begin modelling from a box or a sphere, but usually its from a sphere, even though this seems uncommon. The idea of using this software was very quickly chosen, as we had used this program in our respective jobs, and we feel really comfortable with it.

Lighting
To light the scene we decided to use Global Illumination. Light and colour are important in this work, and as important as the character design. We used the render engine Final Render, which has given us a good result. We consider it as important as the colours and textures.

Dead Osita
Texturing

In general the characters have plain and joyful colours, that try to convey an optimistic scene, and we try to come up with designs that provoke a smile. The material used to give colour to the characters is a falloff. This way the characters look more spongy with a subtle white falloff at the edges. However not everything is plain colour, some of the models have texture, such as freckles, cheek colours, or spots. As the models are quite simple, the textures are also straightforward and took advantage of the Texporter plug-in, which is extremely easy to use and it gives quick results for what we needed.

The ground colour gave us some headache too, because it influences the final result of the scene, very much. We chose yellow because it gave a warm mood, and made it funnier, and achieved the effect using a gradient material.

To summarise, we have a goal, to create different characters, with a studied design and taking special care about the light, and mainly the colour.

Portfolio examples
Romance in the garden
By Jorge Adorni

Modelling
Generally, the first thing I do when I start a project is collect as much photographic reference as possible and then I make some quick sketches (1) to give me an idea about the position and proportion of the elements in the image.

After that I build profiles with curves in Maya, some of which are just as reference of the shape, others are for creating NURBS. Although the final model is completely based on polygons, it is useful in the beginning to work with NURBS for certain parts because it is easy to add or remove isoparms or to make general modifications. Then I convert all the pieces into polygons and combine them into a single piece. Next thing I did was to cut the faces to add detail and do some point tweaking. I mostly use the extrude and split face tool, also the sculpt tool which allows to easily smooth off the vertices in certain areas. The deformers are very useful in this stage, especially the lattice deformer which can adjust a large number of vertices very quickly.

The use of polygons instead of NURBS avoids the annoying stitching process, and I find it is more convenient to build a good UV map instead of making dozens of different textures for every patch. Once the model gets some shape, I do a screen grab and paint a new sketch in Photoshop trying this time to define the final look (the colours, the lights and shadows). Then I complete the model in a neutral pose to set the bones. With the skeleton in its right place I make sure that the model has enough geometry in the critical deformation areas like the shoulder or the elbow. Finally every polygon is subdivided with a factor of two.
**Lighting**

The light in the scene comes from three different kinds of sources: spotlights, lightcards and a HDR Dome. I start up with a basic tri-point light layout (key, fill and backlight). The spots use soft shadows, the key and the fill use warm colours and the backlight a cold colour. The other two sources are based in a Mental Ray feature called Final Gather, which quickly generates radiosity like images calculating only the first bounce of light, giving the image a soft transition between light and dark. The two big lightcards are planes that have a surface shader assigned with a colour value beyond the normal white (values greater than 255 in the RGB range). Also, they enrich the reflections of the metal which mainly use blurred reflections and a suitable reflection map. The last source of light is a feature called Image Based Lighting which generates a surrounding sphere with a HDR sky (3 & 4), as well as lightcards adds light and subtle reflects.

**Texturing**

In the beginning I carefully prepare the UV of every object trying to minimise the distortion and at the same time keep the number of pieces to a minimum, after which I take a UV snapshot (5). To create the old and rusty metal (6) I used a combination of hand-painted and many 3D textures, in this case I chose to bake all the procedural textures. Doing this has some advantages, one of which is that when the geometry is deformed the texture doesn't swim across it. The other advantage is that the render is faster. The texture files have a resolution of 2048 x 2048 for the big parts of the model and 1024 x 1024 for the smaller ones. To create the metal I used 6 different procedural textures, my favourites being volume noise and solid fractal. The base texture is created in BodyPaint 3D, where I define the areas of colours and important details. It is a great tool because it is very efficient for painting seamlessly over one or more objects, and can paint multiple texture channels at the same time and build custom brushes. In Photoshop I bring together the base image from BodyPaint and the baked textures from Maya, use some blending modes to get the right look and make some masks to show up the details only in the desired areas. Based on the layers of the map, I created the bump and specular maps which act as a reflectivity map also. With all these images I build a shading network in Maya where I like to insert a sampler info node and some ramps to control the values according to the facing ratio, which is useful for making the borders slightly brighter and more reflective.
Rendering

When I am happy with the general look of the render I start to plan the different passes: colour pass, shadow pass, specular pass, etc. I also generate a mask (7) for every object and a Zdepth channel (8). I prefer to apply the depth of field effect in Photoshop when the image is ready instead of doing it directly in the render. With the elements gathered in Photoshop I mount all the passes with the blending modes and masks. In this way I have a great degree of freedom to edit every aspect of the composition. Then I correct any imperfection in the render and do some colour correction, the only filters used are gaussian blur and lens blur. Some extra details are painted directly over the image in this stage like the tear (9). After that I create layers of subexposure and overexposure to add some light and shadow. Finally I use a few layers to provide a very slight dirtiness over the characters, such as floating particles in the air and a little bit of a film grain.

Portfolio examples
**Modelling**

The modelling process is quite easy, since the robot has separated parts, that are both parts of his body, and the animation structure. He was built to be animated, not simply to render, so each part was designed to behave as part of a bone structure.

The technique used was poly modelling, employing simple primitives to get a fast and good shape result. The femur, for example, are simple spheres connected by a bridge of polygons (1). The hands are made from simples boxes and the fingers, modified spheres. My main challenge in modelling with basic primitives was to get a really cool cartoon design without spending hours and hours making a complex model. I asked myself how simple can I build a good and charismatic character... well I thought I would get a good result from simple and fast modelling, good design and a functional animated body.
Texturing

I think the most complex part of this project was texturing. In spite of his cartoon style and simple shapes, the nature of the character asked for a little bit of complexity in the textures. Since he is a robot, I tried to give him a metallic aspect, but as he is a working robot, we can use our imagination to give him some life. I tried to show that he’s not a brand new robot, that’s why he has some scratches, and peeling paint, located on his hands (3), feet and on his belly (4), where there’s a kind of oven. My intention was to show the parts that are used more frequently than parts that naturally wear through time.

I used hand-painted maps, and I tried to separate each scratch from the base colour, also the letter “H” (4) and the peeling parts. Separate parts are very helpful when I’m building the bump (5) and specular maps (6). The bumps make the scratches more visible, and help to show the weathered look. The specular maps make the scratched and peeled parts more flat, in contrast with the painted (yellow) parts that are polished.

I take advantage of this approach to design the mouth and eyebrows. The texturing process was the main component in this project. The challenge here was to give him a more realistic look, without losing the cartoon style, and discover the best way to improve the personality of the character through his textures.
Lighting & Rendering

Since the image has no background, the light was set up with only the robot in mind. It’s a very simple light set-up, with two lights, and I used the renderer to calculate Global Illumination with an influence of the orange colour on background. This gives the image more atmosphere.

To get a better render, I rendered a Z-depth image (7), that was used in post-production to simulate the depth of field I also used post-production to make the yellow-to-orange gradient, to get a centralized composition, helping to show the silhouette of the robot. Some colour adjustments were made to give the render a better look along with a little bit of noise to help in the depth of field effect.

Portfolio examples
Ninja
By David Drbal

Concept
Cartoon gives you a lot of freedom. You can do whatever you want, adding extra things to your character, but still don’t forget where the character has been. Character design is not just a model with human, animal or other living forms used to shape it. The primary task before you start work on any character is to decide his personality. People watching my pieces often tell me it has strong, great personality, even when they are mostly early work in progress, without poses or facial expressions finalised. You need to add all personality to the whole character and forget that just the head is conveying the character’s personality. It’s whole body tells you what kind of character he is. Think about his personality and discover the body shapes which will reflect this, then choose suitable poses. Don’t make him just stand upright and if you can’t find a pose, go in front of your mirror and be the character, make a pose as he would.

Let’s go a bit deeper and have look at how the Ninja character was made. The first decision I made was concerning what the character actually did. I didn’t want to create just a big guy, who knew how to beat up someone. I wanted to add something that my previous characters had, to make him a person with feeling. A character, who controls war techniques, but isn’t a war machine without feelings. So I knew a big guy with large muscles and a small head, where the brain couldn’t be very big, was not the way. I knew that I could show his power in other ways, so I made a well-skilled warrior, with a stylized athletic body with an appropriate pose. When I clearly knew what I wanted to do, I picked up my sketchbook and tried giving him a shape (1). As always I start with simple spheres and played with proportions, and when I was satisfied, I added the details. One great tip I came across, but can’t remember who said it is this, “Your character is ready not when you do not have anything to add, but at that moment when there is nothing more to take away.” This is a great theory that works 100%. Don’t try dressing your character with too
many things, just add those aspects which are really necessary and not those that you just like.

**Modelling**

When the concept sketch was done, I did one more for the backdrop. I loaded it into the modeller and started in the same way as I did with the drawing. Simple geometry at first, to make sure it looked as good on the sketches. After making a few adjustments and when I was happy with the result, I used that model as reference and then started adding details. So as you can see, I didn’t use the head as a starting point, but rather the whole body. The head is only a part of the body as is the hand but I do not pay attention to individual parts. I need to balance the character and all parts need to be placed in harmony with one another. A character is a complex model, and every part has a meaning and function. It’s not about the head particularly, it’s about everything together and how it all works. I mainly use the box modelling technique when making a simple character and then gradually add details. When I make a more detailed character I use polygon by polygon technique, and sometimes I combine the two approaches. For Ninja however, I used the box technique. One of the best things about both techniques is that you get the right shape quickly, but sometimes it’s hard to add details in the proper way.

Once the model was finished, I needed to pose my character in a manner reflecting the sketches (2), so I made a rig and adjusted the weightmaps. One of the most important things to remember when making a character is how it will deform and then, pay attention to places where the body will bend. If you want your character to appear believable, you need to follow a few anatomy rules. With this in mind it’s important to plan your mesh, particularly in areas that will deform the most. A good method is to build the skeleton first and then you can clearly see where your character will be deforming, and adjust your polyflow from that. It’s necessary to put more polygons at places where the bending is more extreme, such as the knee and elbow joints. Even though many people build character meshes with the arms up, I prefer do it with arms down in a relaxed position (3). One of the reasons for this is that most of the time your character will have their arms down. I also pre-bend the legs and arms, so when I do apply bones I’m sure they will rotate in the right direction.
Rendering

The rendering was the biggest challenge for me, as I haven't used the Softimage XSI toon shader before. I discovered that XSI has a very powerful toon shader (4), and it's very simple to set up. One of the important things in toon is the lighting and as toon shaders react to lights, you need to pay attention to light positions, intensity and colours as well. I used two point lights, one green light to fill the scene from the top, and a second blue/purple light for lighting the character from the back. When I got the result I was happy with it added outlines by lens effect called "Toon Ink Lens". As you can see, I used almost exclusively XSI toon shaders for the whole scene and only used image maps for the background and eyes. The background image was used as a 2D background in XSI and the eye image map was UV mapped onto the eye. I wanted to keep the image clear, and adhere to the toon look and simplicity of the character. After the render was done, I used Adobe Photoshop for a few corrections. I adjusted the colour, and added an extra blurred layer, with a 50% overlay for a soft look (5).

So that's all. I hope it wasn't too boring, and you learned a little from the way I work and if you did learn, that's great. I didn't have space and it wasn't the aim to do a whole tutorial on how to do characters in 3D. If you do make the decision that it's what you want to do, I recommend you do one important thing, be the character, feel what he feels. Don't look at yourself as a freak, thinking as the character thinks, because that way you can add life to him. Smile when you're doing him smiling, be angry when you're doing him angry. Live every moment with him and I promise that when you share him other people will relate to him. The character needs to be alive and you are the one who has the chance to give it that power. If not, he will be just another nice looking CGI model, but not a person with feeling.

Portfolio examples
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