The pigeon and the mouse

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The Pigeon and The Mouse
By
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Submitted in partial fulfillment of the Requirements for the Degree of MASTER OF FINE ARTS

MFA Imaging Arts / Computer Animation
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The Pigeon and The Mouse

A computer animated work by

Elsi D. Caldeira Mendes

Original music by: Simos Economides (http://simos.net)

Length: 3 minutes: 40 seconds

Color

Stereo sound

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Permission granted

Title of thesis: The Pigeon and The Mouse

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Date: 07/08/03 Signature of Author: ___________________
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I want to thank you my parents, without their support I could not be here.

Thank you, to my mom for being always by my side especially when I needed someone to support me and give me strength to keep going.

Thank you, to Stephanie Maxwell for all her advice, feedback and meetings.
I. Proposal

A. Story

When I began to think about what I wanted to do for my M.F.A. thesis, I thought about my native country, Venezuela. I started to read a lot of short stories, myths and legends. When I was a child I loved stories that imparted lessons about truth, values, morals, etc., using animals, like the Aesop's fables. These kinds of tales are very common in Latin America as well. At first I was thinking of adapting one of these tales and animating it. I asked for help from Diane Forbes (Associate Professor of Spanish, Department of Language & Literature at R.I.T), especially for suggestions of reading materials on Latin American folk tales, since her specialty is Spanish literature and language. For a long time I read different kinds of Latin American stories. Finally, one day I came up with an original idea for a story about a pigeon and a mouse to tell a tale about devastation in the form of poverty and about caring. At first I placed the action in a modern city, but then I realized that I was not centering my theme in my own country, that has so many small towns and rural areas that were, in fact, inspiring my vision for this work. At the suggestion of one of my classmates, Charles Bandla, I decided to use the architecture and landscape of Venezuela to build the story. The location evolved into the setting of a small, abandoned house located in a deserted rural area.
B. Original Proposal

The following is my original proposal, which was presented for faculty review and approval. Proposal reviews for graduate thesis works take place in the spring of each year. In my case the review of my proposal took place in the spring of 2002.

1. Storyline:

A pigeon tries to move into an old house, but a mouse makes her mission almost impossible.

2. Synopsis:

It is a hot day at an abandoned farm. Dead crops surround an old farmhouse. In the field a mouse scratches along the dusty ground looking for food. In the sky a pigeon flies above the dead crops, but the mouse is so busy that he does not notice the pigeon. The pigeon inspects the old farmhouse. She sees a good spot to build her nest on one of the roof’s beams. Immediately, the pigeon starts to look for materials to build her nest.

The mouse finds some grain on the ground, and carefully gathers it together. The shadow of the bird passes over the mouse. The mouse quickly picks up the food, and scrambles into the house to hide it. The pigeon returns to the house with several pieces of straw for her nest and something to eat. Meanwhile, the mouse hides his food inside of his hole in the wall. The mouse emerges from the hole, and looks up. He is surprised to see the pigeon, who is eating on the beam above. The mouse runs back inside his hole and starts
nervously counting the grain. The mouse peeks from his hole and watches his new housemate. The pigeon finishes her meal and then flies out to look for more straw, leaving some of her grain behind. The mouse creeps out of the hole, and when he is sure that the pigeon is gone, he goes to where the pigeon has been building her nest. Rifling through the straw, scattering, and kicking the nest to the floor, the mouse discovers the leftover grain. He picks it up and runs back to his hole. The pigeon returns with new straw only to find the nest destroyed and the food gone. The pigeon then flies around the house to find another place to build the nest. The pigeon picks up the pieces of straw from the old nest, and starts to build a new nest behind an old couch.

Munching on grain back in his hole, the mouse suddenly hears sounds of the pigeon nearby working on her new nest. He peeks out and sees that the pigeon is still in the house. The mouse waits until the pigeon flies out of the house again and runs to the nest. He jumps on it several times to destroy it and in the process finds more grain. He picks the grain up and runs with it to his hole. The pigeon returns to find her nest destroyed again, and her food gone. She looks around, but everything looks normal. She proceeds one more time to build a nest, but this time in the kitchen.

The pigeon finishes building the nest and purposely leaves some grain on the floor near the nest. She hides inside of an old cabinet to watch her new nest and the food nearby through a slim opening in the cabinet door. The pigeon sees the mouse run to the nest. He flings the straw into the air and runs to the food. Greedily, he scoops it up. As the mouse prepares to run away with his
new cache of grain, a shadow suddenly covers him. The mouse slowly turns toward the shadow’s source. He looks directly from the pigeon’s feet to her head. The pigeon is angry and the mouse grimaces lightly at her. The pigeon points at the food, but the mouse does not drop it. Instead he clutches it even tighter. The pigeon softens her expression and then flies up to a window to survey the poor and diminished surroundings and buildings on the abandoned farm. The pigeon flies from the window into the air, and she sees the misery of life at the farm – the carcasses and bones of rodents, rabbits, long dead stalks of corn, and the parched and dusty landscape. The pigeon makes her way to a meadow near a stream miles away. She picks fresh wild blackberries and returns to the old house. The pigeon enters through the window. The mouse is still sitting, holding the grains that he had stolen. The pigeon offers the wild blackberries to the mouse. The mouse at first hesitates, but then picks up the fruit where the pigeon has dropped it. The mouse hungrily devours the fruit. The pigeon watches him. When the mouse has finished eating, he quickly runs to the grain and scoops it up. He starts running in circles in front of the pigeon. He runs faster and faster causing dust to fly and fill the air. When the dust finally settles, a new nest and the stolen food appear at the pigeon’s feet. The mouse is standing next to the nest. The pigeon suddenly launches into the air, casting a shadow over the mouse, the mouse cowers in fear, and the pigeon lands on her new nest. She extends a wing and gently covers the mouse and drawing him to her.
3. Approach:

This is a 3D computer animation piece. The farm and the farmhouse design are based on actual farms structures in my country, Venezuela.

C. Review Process

The proposal review process took more time than I had planned. One recommendation by the review committee concerning my story was to modify and clarify the ending. For a long time I could not come up with a good ending. Since I did not want to waste time I began to model the characters and the set while I was working on the story. As a computer engineer I believe that a project continuously evolves with many reviews at different stages of the work.

I went over my story many times to see how I could find an appropriate and workable ending, but I also experienced a creative block as time was passing by. By the fourth week of the winter quarter I still had not resolved all of my story revisions and this was throwing my timeline off. Also, considering the fact that I am not a proficient animator I needed to settle the details of my story somehow to be able to work continuously on the animation of all scenes and finish the work by end of the following spring quarter. Finally, I came up with a solution that would keep me on track. I pared my original story down by eliminating two of the three attempts by the mouse to destroy the pigeon’s nest. Instead, the pigeon would discover after the first time that her nest was destroyed that it was the mouse who had perpetrated the destruction. But, still I needed something else to give a reason for the pigeon to look for the food to offer to the
starving mouse. By the post-production stage, and at the suggestion from my chair, Stephanie Maxwell, I added one more shot where the pigeon actually hides herself behind a window frame to spy on the mouse. She observes the mouse in the act of eating some kernels of corn, but he is so weak and tired that he falls asleep. This observation by the pigeon of the mouse’s sad behavior gives motivation to the destructive acts of the mouse (i.e., not wanting to ‘share’ the depleted space of the house), and elicits the pigeon’s empathy and her eventual charitable act to provide for the mouse.

I had many different endings for this story. The very first ending was that the mouse would realize that the pigeon could bring fresh food from miles away, and the mouse would decide to be nice to the pigeon and fix her nest. When the pigeon would return and see her nest fixed, she would get suspicious and then decide to abandon the place to build her nest, thus leaving the mouse alone to starve. However, this ending would not be consistent with the theme of deprivation remedied by charity.

While animating this last scene I attempted to express my original idea by way of the mouse’s facial expressions and gestures. I wanted to show that the mouse did not regret at all what he did, so that when the pigeon offered him fresh food the mouse would pretend to be nice to the pigeon to take advantage of this new situation to simply survive. I wanted to draw the parallel to how some people will approach others pretending to be nice, but for selfish reasons will take advantage of the good nature of others who really want to help. However, I think it was too difficult to convey this ‘last-minute’ idea at this late stage of the
production. In the end, I decided to show that both the pigeon and the mouse could co-exist mainly because of the empathy and charity of the pigeon.
II. Pre-Production

During the summer of 2002 I began research on rural farmhouses in Venezuela. I visited many websites on the Internet with information about and pictures of my country. I collected many pictures of houses and impoverished landscapes. At the same time I began working on my storyboard, characters, and set designs.

For character design I collected pictures of real mice and pigeons, since the style of the work was to be predominately realistic. I wanted the two characters to look like a real mouse and a real pigeon. The mouse design followed the typical characteristics of a cute character profile: large head, big, expressive eyes almost like a cute baby (see Appendix C2). I always remember the very expressive eyes of Bugs Bunny, especially when he is in trouble or when he is manipulating his opponent. To balance out any cartoony effect I designed the mouse with more realistic features such as fur, and I generally followed a mouse’s anatomical appearance.
The pigeon was designed to look and act like a real pigeon, very unexpressive and looking more threatening than kind (see Appendix C2). I wanted the pigeon to have real feathers on her body and wings, and her movements would be very bird-like.

The inspiration for the design of the house came from typical small houses in the countryside of Venezuela (see Appendix C1). These houses are characterized by red tile roofs, stucco or earthen walls, and bare floors. The outdoor landscape was designed to convey abandonment, poverty and desolation. Around the house is a dry, cracked ground with old, dead cornstalks, dry grasses, and suggesting an overall barren environment. Places like this exist in Venezuela during the dry season, and are especially harsh and forsaken.

The storyboard was a challenge and underwent constant modifications due to ongoing story revisions. Since I was having difficulties with the story, but I was happy with my characters and set design, I proceeded with selective aspects of production beginning in the second half of the summer of 2002.
III. Production

Production began in late summer 2002 and continued through spring of 2003. The production stage covered modeling, texturing, rigging, skinning, lighting and the animation. To accomplish my production I used Maya 4.5, Adobe Photoshop 7.0 and Adobe After Effects 5.5 Production Bundle.

A. Modeling

The modeling process took half of the summer and all of fall quarter to be completed.

In my previous works I had problems with my modeling because I did not know how to build a good model. I researched several tutorials, and by trial and error I found out that I was more comfortable doing NURBS modeling. Also, for the mouse fur using NURBS was practical and also easy. Maya Fur requires having very good UVs for polygon models. NURBS models already have the UVs information built. Because of this I decided to model my characters using NURBS patches methodology. Since it was my first time doing NURBS patches it took me quite a while to comprehend how to put together my model, but after many tests I was able to complete the mouse model by the beginning of the fall quarter. To model the feet and hands I used polygons, and later on I transformed them into CPS.

I modeled the pigeon using NURBS patches also. Since I was now an experienced NURBS modeler I was able to model the pigeon in only one week. Later on in the production, after some texturing problems, I converted my
NURBS pigeon into polygon. For the wings and tail feathers I used NURBS planes. In the beginning I thought I could use the same pigeon model for the ‘standing pigeon’ and the ‘flying pigeon’. During the rigging process I tried to implement both functions, but when the pigeon had her wings folded I did not like the look of all the feathers folded onto the pigeon’s body. By the middle of the winter quarter I decided that I needed two pigeons, one for flying and one with the wings folded. To model the ‘folded wing pigeon’ (i.e., “standing pigeon’) I took the first body of the ‘flying pigeon’ as a base, and then modified the wings and feathers onto this base.

To model the set I used polygon and NURBS. I avoided creating details during the modeling stage. The details were created later on in the texturing process. The model of the house was very simple, just polygon planes for the walls and polygon cylinders for the columns. The most tedious work was the roof. At first, I tried using displacement maps, but I did not get the look I wanted. I built one roof tile out of NURBS, and I replicated it to create all the tiles that I needed. After all the tiles were arranged in position on the roof, I deleted some tiles and modified others to give the roof an old and abandoned look.

For the deserted landscape, I used a NURBS plane for the ground and modeled one corn plant, which then was replicated to create a stand of corn plants sitting next to the house. Later on I made some modifications of individual
plants to give each a different appearance. For the green landscape, where the
pigeon travels to in search of food, I modeled one berry plant using NURBS and
replicated it to create an abundant berry patch. Trees were Maya Paint Effects
and a NURBS plane was used for the ground. I rendered one tree and one berry
plant then brought them into After Effects to do the final compositing.

B. Texturing

To complete the texturing stage, it took almost all of fall quarter of 2002. I
overlapped modeling and texturing at the same time. This is one of the
production stages that I enjoyed the most, and it was an important phase in
creating the appearance of my characters and set.

I put fur on the mouse using Maya Fur. As I explained previously, fur
requires having good UVs. NURBS turned out to be a good technique to avoid all
the UVs process. Later on, I painted the fur to create special details and to
modify the color and the look of the fur.

The pigeon was quite a challenge to texture. At first it was a NURBS
patch model because I wanted to try to put fur on her body to simulate feathers.
However, fur did not look right on the bird. For a NURBS patch model it is easier to texture using a painting program like Deep Paint or something similar. Maya provides a 3D texture painter, however the different sizes of the patches were giving me problems. Finally, I decided to transform my model into a polygon model and deal with UVs. To create the pigeon’s body texture I painted a color feathers map in Paint Effects. I took this color map into Photoshop to adjust its colors. For the final touch I created specular and bump maps to complete the pigeon’s body appearance. For feathers I found a real pigeon’s feather and scanned it into Photoshop to create the color, bump and transparency maps, and then I applied these maps to the NURBS planes.

All textures for the inside house walls were made in Photoshop from scratch. To create the wood texture for the ceiling and columns, I scanned a piece of wood and brought it into Maya where a layered texture was used to create additional effects of dust and grime.

The cracks in the ground outdoors were made in Photoshop from scratch using an actual photograph of cracked ground as a guide. To create the leaves of the cornstalks, I scanned a real corn leaf using the same process as for the feathers of the pigeon.
C. Rigging and Skinning

The rigging process is about setting up characters for animation. The skinning process is about attaching models to skeletons. In my opinion these were the most arduous tasks in the production, especially in Maya. It took me close to all winter quarter to complete this stage.

For the mouse the rigging set up was very simple. I simply created the basic controls for hands, feet, body and tail. The most difficult work was the skinning. Since my mouse is a NURBS patches model the challenge was to keep all pieces together. This means that during the animation process I had to avoid the possibility of some patches breaking apart and at the same time assure a nice binding of the geometry. For these reasons the skinning was quite a long process. After many hours of researching on the Internet and in books I found out that the best way to attach a NURBS patch model to its skeleton is by using indirect skinning. I created lattices in different parts of the mouse’s body to keep all patches together -- one lattice for the body, one lattice for each arm, and one lattice for each leg. I used smooth bind to attach all lattices to the skeleton. Using lattices provides the advantage of having fewer points to weight to ensure a nice binding deformation. However, the only way to weight these points is by using the Component Editor when using smooth bind.

When I designed my characters, I made sure that the mouse was biped instead of a four-leg structure. This was intentional, especially for the animation part because it would be easier to animate overall. Originally I thought it would not be so hard to build the skeleton of the pigeon. The body and legs were in
fact easy to build, but the wings were unbearably hard to set up. As I mentioned before, my initial intention was to have one pigeon model to do the flying and also to be able to fold its wings when standing or walking. But to setup the folding part was more complicated than I thought, especially with all the feathers attached to the upper part of the wing. I did some research on bird anatomy to help me to visualize and construct the pigeon’s skeleton. To set up the wings for flying I created a wing control, and with the help of IK Spline and clusters I set driven keys to create the key positions of the flying sequence. This greatly simplified the animation process for the flying pigeon. Using the same wing control with a fold property I tried to set up the folding of the wings interchanging between IK and FK. This worked partially, because when the wings were folded the feathers did not look right especially for close up shots. Also, instead of doing direct binding I attached the lattices to the skeleton. This method gave a nice deformation to the pigeon’s wings and body. Also, lattices helped to keep all the feathers together and attached to the upper part of the wing.

D. Lighting

I prefer to set up the lighting before starting the animation. Later I can refine the lighting before the rendering process. It only took two weeks to create the lighting.

I was fortunate when Alias Wavefront offered Mental Ray for Maya for free. This allowed me to render my outdoor scenes using Final Gather. However, I had to pay a high price in rendering time, but it was worth it as the final result was spectacular and really what I was looking for (see Appendix C1).
For the indoor scenes, I used Maya lights. I wanted to create a palpable atmosphere to reflect the loneliness and desolation of the place. To achieve this, I used fog and applied a 3D procedural texture to the density of the fog. Also, I animated the 3D placement texture to create the moving dust in the environment. However, when I rendered my indoor scenes I had a horrible flickering effect. To solve the flicker problem I used After Effects and Photoshop. First I rendered a still image of the background in Maya, and then in Photoshop I created a noisy texture with alpha channel. I brought the still image and the texture into After Effects where I created a layer with the noisy texture over the rendered images, and animated it across the screen. I was very pleased with the results of this procedure.

E. Animation

I began animation by the end of the winter quarter and finished it by the end of spring quarter. To me, animation is the second most arduous task in the production stage after rigging and skinning.

For reference I studied the walking and flying movements of real pigeons. The walking was easy to study, but the flying was really difficult to observe. A helpful resource for understanding the flight of birds is Eadweard Muybridge’s sequence photographs. I found the photographs very helpful, because I could follow the patterns of bird flight through the photographic sequences.

For previous animated works I only had one character to animate. For The Pigeon and The Mouse was the first time that I had two characters to animate in full motion. I am more of a technical person, therefore I am more
comfortable doing texturing, lighting and compositing. However, I always try to do decent animation. It is not perfect, but I do my best.

The mouse is the character that needed more animation than the pigeon. The motion of the mouse is a hybrid between mouse and human movements.

After previous setup during the rigging and skinning process, the animation of the pigeon went very smoothly. For the flying sequence I key framed the main positions, then I cycled the movement as many times as needed.

The animation of both characters depended on the set up of each of a wide variety of shots in the story. Animation ranged from simple to very complex. The long shots of the mouse walking toward the house were the simple ones because I did not have to worry about animating intricate details. Close ups required animating more complicated and detailed movements.
IV. Post-Production

Post-production began and finished in the spring quarter. Rendering, compositing, editing and sound were part of this stage.

While I was working on animation, I created playblasts and used Adobe Premiere or Quicktime Pro to review continuously and progressively how the story was working. This gave me a preview of the success of combined shots and sequences.

A. Rendering and Compositing

One of the technical challenges of *The Pigeon and The Mouse* was the rendering. When I had my texturing done I began to do test rendering especially with the mouse because he had fur on him. When I rendered the mouse by himself the render time was reasonable. However, when I incorporated the mouse into a scene with a background or with the pigeon present in a shot, the rendering time skyrocketed. Rendering times rose to ten minutes per frame in some shots, even if I hid all the set elements. This alarmed me, and for a moment I considered removing the fur from the mouse thinking that the high render time was due largely to the fur. The next solution was to reference the set instead of importing it into the scene. This allowed me to unload the background set when I did not need it to cut down on overall render time. This solution worked, and my render times were reduced significantly. However, I had to render some shots twice, in particular the shots where the pigeon and the mouse appear in the same shot together. I rendered shots with each characters
separately before compositing them together. I kept track of all my shots in my journal and made sure that I had all my frames rendered and matched. Finally, I used After Effects to composite the separate elements of each sequence.

B. Sound

For the soundtrack I wanted to use music from my country. There are many different rhythms and musical instruments in Venezuela, but I felt that a classical guitar sound would be interesting for this work. I knew little about classical music from Venezuela. I did some research and found a Venezuelan composer named Antonio Lauro. I listened to several pieces from his repertoire and found that his style of music was very complimentary to the mood and theme of *The Pigeon and The Mouse*. I began to look for a composer early in 2003, but had little luck initially. I tried finding a composer again in the spring, and at the same time I tried to contact people in Venezuela to give me some information about use and copyright of Antonio Lauro’s music. To my surprise a local Rochester composer contacted me. His name is Simos Economides, and not only is he a composer, he is also a computer scientist and ironworker. Since 1995 he has composed several works encompassing the classical, popular, electronic, world music and experimental genres. With his piano, guitar, computer, and various world instruments, and also driven by his undiagnosed Attention Deficit Disorder, he is constantly in search of out-of-the-ordinary projects to collaborate on. I was very pleased when Simos composed a sample musical opening. I gave him a rough-cut by April 30th, and by May 12th he gave me the finished soundtrack! Simos does not have professional recording
equipment, and as a result the quality of the soundtrack was quite low, but in the end and with some soundtrack tweaking using SoundEdit 16 the musical score for *The Pigeon and The Mouse* is really wonderful.

When first I thought about the story I had planned some sound effects, such as the pigeon making noises to get the mouse's attention or to wake the mouse up. I changed my mind and decided on having a solely musical soundtrack. This allowed me to tell the story completely by visuals without sound effects. Also, I am not good sound designer, and it was for me a wise decision to keep the sound musical.
V. Conclusion

When I began the graduate program at R.I.T I did not know anything about creating animation, and especially about the 3D-computer animation technique. Early on, I began to teach myself many aspects of 3D, such as modeling, texturing, rigging, skinning and lighting. My first year and second year graduate projects helped me to decide what I really want to focus more on and also gave me the opportunity to be able to build a story for my graduate thesis project. I created *The Pigeon and The Mouse* as a little folktale with elements from my native country Venezuela to tell a universal story about charity and caring.

The year I spent working on my thesis project was full of learning new techniques and independently producing a significant and successful animated work. In my opinion the thesis project should be an enjoyable process. If something did not work I always looked for a solution and kept going. Never give up because there is always a way around any obstacle.
Appendix A

(Budget, Timeline)
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<th>Quantity</th>
<th>Subtotal</th>
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**Subtotal** | $59,088.93 | $398.97 |

10% contingency | $5,908.89 | $39.90 |

**Total:** $64,997.82 | $438.87 |
Appendix B

(Original Storyboard)
The Pigeon

and

The Mouse

Shadow Passes Over
Moose
(stories)
(sounds)
(birds)
(sky)

Mouse
(stories)
(sounds)
(looking up)
(looking down)

Building
(stories)

Establishing shot
(inside)
(mouse walking toward the house)
Mouse goes out

Cut to

Mouse

Put cookies in the drawer

The mouse climbs up the ladder

The mouse breaks the cookies

The mouse jumps on the table

The mouse opens the drawer

The mouse eats cookies
Mouse ears are too fat but they dig.

Pigeon flying to land on dry and destroyed landscape.

Back to the house.
Missing Page
Appendix C

(Color Prints)
VI. References


- http://www.maya3d.dk/links/tutorials (Maya tutorials database).