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### Love Sip

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# Love Sip

By Tianshu Liu

AN ANIMATED THESIS PRODUCTION  
SUBMITTED IN PARTIAL FULFILLMENT OF THE  
REQUIREMENTS FOR THE DEGREE OF

MASTER OF FINE ARTS  
IMAGING ARTS/COMPUTER ANIMATION

SCHOOL OF FILM AND ANIMATION  
COLLAGE OF IMAGING ARTS & SCIENCES

ROCHESTER INSTITUTE OF TECHNOLOGY  
ROCHESTER, NEW YORK  
JANUARY 2016

## Committee

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Stephanie Maxwell, Professor/Animation Program Chair  
School of Film and Animation

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Mark Reisch, Lecturer  
School of Film and Animation

# Abstract

*Love Sip* is an animated graduate thesis film. The entire film, including the credits, is 4 minutes 58 seconds long. The premier of the film occurred in December 2015 in the School of Film and Animation's end of semester screenings at Rochester Institute of Technology.

The story takes place in a vending machine. The main characters are a bottle of Soda and a bottle of Juice. They fall in love and try to escape from the vending machine. Their journey is challenging, action packed, and with the promise that their love for each will survive.

*Love Sip* is a 3D animation that combines 2D with 3D software, including Adobe Photoshop, Autodesk Maya, Pixologic Zbrush, Adobe After Effects and Adobe Premiere. The final output format is 720P HD with a high-quality stereophonic track. This thesis was inspired by process, feelings, challenges, and breakthroughs in my production, and progressive learning and understanding of animation.

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# Introduction

*Love Sip* is a love story that takes place in an ordinary vending machine where a Soda falls in love with a Bottle of Juice. Unfortunately, this love is doomed and can only last a short time before they are bought by someone outside the machine and then disappear from each other forever. However, Soda tries to help Juice fight against an evil Grabber inside the machine that is threatening Juice, and Soda must save her. The Grabber has Juice and throws her into the dispenser area, but Soda is there already to prevent her from falling out of the machine. After she realizes Soda's rescue and his love, Juice overcomes her fear and they unite to save themselves. But then, suddenly Soda is pulled from the vending machine by someone who takes Soda and walks away. But Juice uses her round body shape to roll in front of the person on the street and trips him and Soda is released during the fall. Eventually, the two are free and drop into a sewer and float away together in the moving water. But, ahead of them is still danger from a whirling fan vortex in the water. But together they are fearless and confident in face of this new challenge.

## **Acknowledgments**

During the year that I was producing this short film, I received a lot of help. The hardships and difficulties that I had experienced in this process were conquered by the encouragement and support I received. To begin with, I owe my largest debt of gratitude to my supervisor, Professor Stephanie Maxwell. She is not only my supervisor in terms of the academics, but also my mentor in terms of my heart. During the preparation for the first thesis proposal, I had experienced a serious car accident. It was Professor Stephanie who brought me comfort and gave me confidence to be optimistic and strong-minded. During the production of the film, she constantly gave me inspiration and enlightenment that helped me add more radiance to the content and the characters. Without her help and guidance, it would have been impossible for me to overcome my personal difficulties and finish this film with the needed effort and positive mental attitude. Professor Skip Battaglia and Lecturer Mark Reish also gave me a lot of help in the writing of the script and 3D effects, which were great contributions in the development of this work. My sincere thanks also go to Ruudy Liu, who did the sound design and music without hesitation even though he was busy with his own study at that time. He did several versions of the soundtrack in order to perfect it for the scene where the Grabber appears. I am also grateful to many other friends and fellow students who have contributed to my work, and it would have been impossible for me to finish the work without them.

Finally, I wish to express my heartfelt gratitude to my family, and to my girlfriend Angie An. It is Angie that brings my vision of the love in the film to life.

### ***Love Sip Description***

A bottle of Soda wakes up in a mechanically noisy vending machine and he looks around curiously. The environment is very dimly lit and above him is a dark red light. All around him are rows and rows of bottles and containers of drink. He suddenly spots a beautiful bottle of Juice and falls instantly in love. Juice acknowledges Soda and they flirt. The sound of the gears turning inside the vending machine grow suddenly loud and a Grabber claw enters above them. The Grabber grabs a carton of milk, who struggles in the grasp of the Grabber. The Grabber throws the milk roughly into the dispenser compartment below. Both the Soda and the Bottle realize for the first time that they are inside a vending machine and start to worry more and more as more drinks are disappearing down the dispenser. Juice is so afraid that she starts to cry.

The horrific sound of the gears grows much louder and this time the Grabber moves directly toward Juice. As the Grabber appears to want to take Juice, Soda stretches his head into the gears above to try to stop the Grabber from capturing Juice. But the Grabber shakes Soda off and grabs Juice. As the Grabber moves to dispense Juice, Soda jumps down into the dispenser outlet and blocks Juice's exit from the machine. She lands on top of Soda, and when they are about to kiss each other, the vending machine suddenly starts to shake

violently because a man outside the machine starts shaking the machine, probably because he has waited so long to get his Juice. Soda falls out of the dispenser and is taken away by the man. Juice jumps from the vending machine to the outside and follows the man who has Soda in his hand. After reaching a busy street, Juice sees that the man who holds is going to get away from her. She lays down on her side and quickly rolls towards the man and in front of him. The man stumbles over Juice and falls to the ground and releases Soda from his hand. Juice and Soda find each other and quickly jump down into a sewer. Bottle and Juice are floating in the moving sewer water. They nuzzle each other affectionately. But ahead of them they hear the growing sound of a huge turbine and a giant vortex of water. They nod to each other knowingly and together jump from the water.



# ***Love Sip* Inspiration**

## **Before *Love Sip***

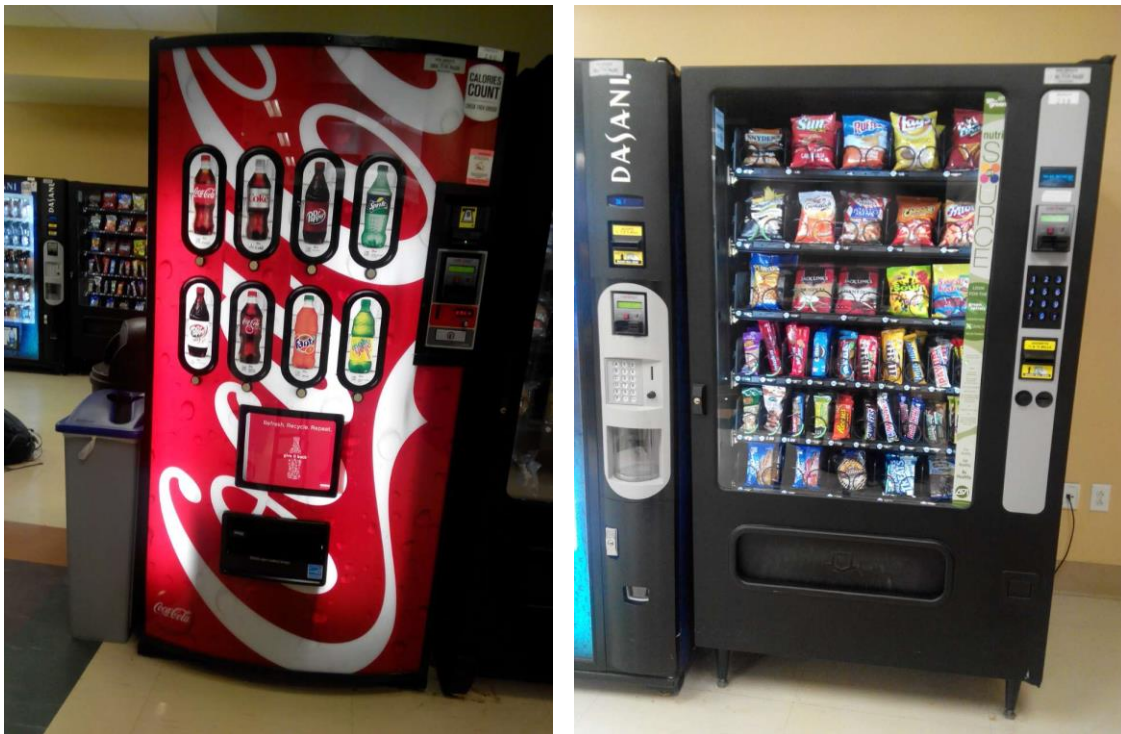
*Love Sip* was my second idea for a graduate thesis production. In the beginning, I planned to make a film about civilization and doom. In 2013, world conflict was escalating and getting worse in the Middle East. Technology was also developing rapidly and our lives are more and more becoming inundated with smart phones, the Internet and the stock markets. These are things that make me think about the future of the human race. Will we be destroyed by growing technology and greedy ambition? What will become of civilization in this age of information explosion? Are we losing the essence of life? These are the things that I thought about as I was finishing the script for my first thesis idea. This script, called *The Tale* was created around my thoughts on the future of civilization. In the story, a primitive man leaves his tribe seeking a holy black forest. The Map shows the direction to the forest where the wood from that forest can be made into the powerful weapons. When he arrives at the forest, it is actually a destroyed modern city, and the “black forest” is the debris of skyscrapers. Human civilization has destroyed itself, and the primitive man is the next cycle of life. After I finished this script, I found it to be too complicated to demonstrate the story in a 4-5 minute film. It really was a film that needed to be 20 minutes or more to effectively tell the story. The proposal for this idea

was turned down by the faculty review committee because of their concern that it could not be finished in a year. Also, the main idea was not clear and convincing. After discussion with Stephanie, I realized it was too risky to make a realistic style animation with a profound story. So, I started to work on another script for the second proposal, with a more relaxing and straightforward storyline. In the meantime, I wanted to keep true to an idea that reflects some truth about life. And, this was the starting place for find the idea of *Love Sip*.

### **Real Life Experience behind the Idea**

This short film is a love story about two bottles of drinks and their struggle against destiny. The inspiration for *Love Sip* was the two vending machines in a hallway in the School of Film and Animation. As a student majoring in animation, working on films all night long is regular routine and students are hungry and tired throughout the night. The vending machine is what we often turn to for help. Some nights, when my colleague Ruudy and I put money into the drink machine to buy bottles of soda, the dispensing Pepsi would get stuck at the exit. Once when my bottle was stuck in the machine, Ruudy bought another drink to try to jog mine loose. But, his drink also got stuck. So, we bought several more bottles just to have them all get stuck. The more we tried, the more they got stuck. Finally, there were six bottles jammed into the dispenser end and none could be reached. We shook the vending machine

exasperatedly but still the drinks failed to come out. We left with huge frustration. On our way back to the Lab, I said jokingly to Ruudy that maybe the Pepsi wanted to stop us from drinking them because they must be couples. They love each other so much that they were fighting against us from getting them. So love was where the inspiration came from.



The vending machines near our Lab

During the summer vacation in 2013, I was thinking about a new story, since I was not satisfied with my first proposed story *The Tale*. Then I remembered that moment in the hallway of the School of Film and Animation. I believed a film in a vending machine could work. There are no other films, as far as I know, that take place in a vending machine. Also, a vending machine story of bottles not coming out is also very attractive and relatable since many people

experience this frustration of bottles stuck in a vending machine. The animation of bottles might be challenging, but it also could be interesting. So I developed the idea and talked with my thesis chair Stephanie about this new story and she liked the idea too. So, we started to work on it.

## **Idea Development**

Since I was little, art has always been my passion. I love drawing and enjoy music. I have sought art since it can bring people happiness, make us feel different emotions, and it can capture a special moment. *Lion King* is my favorite animated film. I learned from this film to recognize the beauty of the arts and I pursued studying art. Growing up in Shenyang, the city that is famous for fine arts in China, I was fortunate to have many chances to set a solid foundation in art and pursue my future career. In order to find a specific pathway in fine arts, I recognized that I was much more interested in the Art in Motion - Animation.

According to Norman McLaren, the famous animator and producer at the National Film Board of Canada, "Animation is not the art of drawings that move but the art of movements that are drawn; What happens between each frame is much more important than what exists on each frame; Animation is therefore the art of manipulating the invisible interstices that lie between the frames<sup>1</sup>." He

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<sup>1</sup> *Art in Motion: Animation Aesthetics* by Maureen Furniss

also states that with animation static objects, puppets and human beings can all be animated without drawings. From my perspective, I would consider animation as the art with figures and movements that represent real live-action in an aesthetical way, with various emotional factors.

Speaking of animation, let us take *Lion King* as an example. The main characters are lions, a mandrill is the shaman of Simba, a meerkat and a warthog are Simba's best friends. The essence of animation is somehow utilizing characters as personifications to illustrate real life circumstances. Animators are wise enough to demonstrate feelings and emotions of ordinary things in abstraction films. My favorite scene is that when Mufasa takes Simba to the boundary of their Pride Lands, explaining the fact that life is unpredictable. No matter when you feel alone, always remember there is someone out there who loves you and would support you forever. This is the original intention of my final work, *Love Sip*. I wanted to present a story where even the smallest event in life could be an adventure.

In my story, insignificant and small things like Soda and Juice can face their destiny and pursue their love bravely. This is exactly what I wanted to show, that whenever you feel helpless or alone, you can still remember there will be someone out there watching over you, supporting you, and helping you with their best no matter what happens. When I talked to Stephanie and my advisors Mark and Skip about this idea, they expressed their interests in the love story

of bottles. We constructed the adventure together, with the audience in mind, to create an exciting adventure of Soda and Juice while at the same time drawing parallels to real life in order to evoke emotion.



*The Lion King* by Disney Animation

# Pre-Production

## Pre-Production in Stages

During the Pre-Production stage, I researched references in art and music style. I also went to New York City to take reference photos since the backdrop of a city would be in this film. In the beginning, I tried to present a film noir style using 3D software and create an artistic screen effect by adopting the sharp contrast of white and black, just like in the film *Sin City* with the combination of light and shadow and the meaningfully bright colors (such as bright red and yellow).

My initial idea was to adopt this film noir style in the whole picture to create an atmosphere of horror and pressure. The red light in the vending machine would indicate danger and uncertainty. The visual would be very stylized and artistic, because I did not want my film to look like a general Hollywood cartoon. I believed that the film noir style would achieve the strong subjective emotion that I wanted.



Film noir art style



The use of red in Sin City creates a striking and meaningful image

However, this film noir style is also a double-edged sword. I was impressed by the lecture of Christian Volckman, a director and actor, who is known for the animation film, *Renaissance* (2006). It is a 3D motion-capture animation with a film noir art style. The director wanted to use this style to create a very stylized



look of Paris in the future. The graphic style looks fantastic. However, audiences grew more and more disinterested in the film after about 30 minutes. This style is breathtaking at the beginning of the film because of the high contrast, but it also causes a kind of physical tiredness after a time. This was a challenge for me. From my perspective, it is more important to allow audiences to become immersed into the story, rather than be impressed by a fantastic graphic style. Therefore, I needed to balance both the story and the look of the film. But, Volckman's style was intriguing and I would see how well it worked for my film after I finished the 3D concept work.

For the music in *Love Sip*, I wanted a fugue style because of the repetition and diversity of the tempo in fugue that I thought would be great for the storytelling of the many ups and downs that take place in *Love Sip*.

The following discusses the preparations for the pre-production of *Love Sip*.





*Renaissance* (2006)

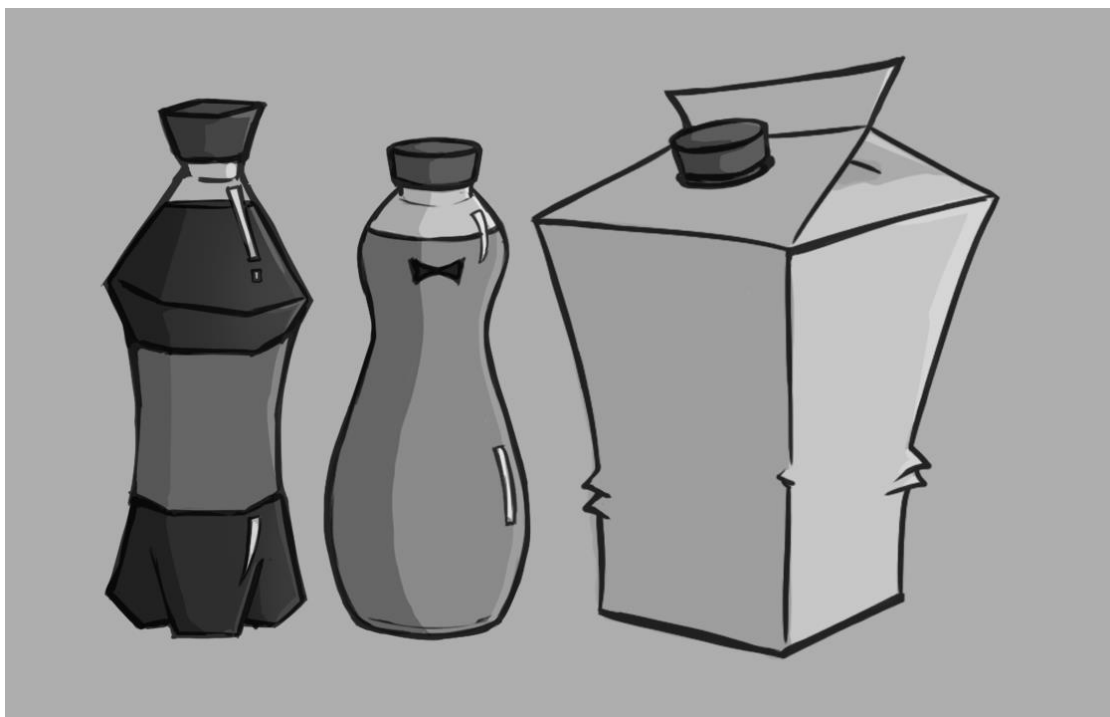
## **Character Design**

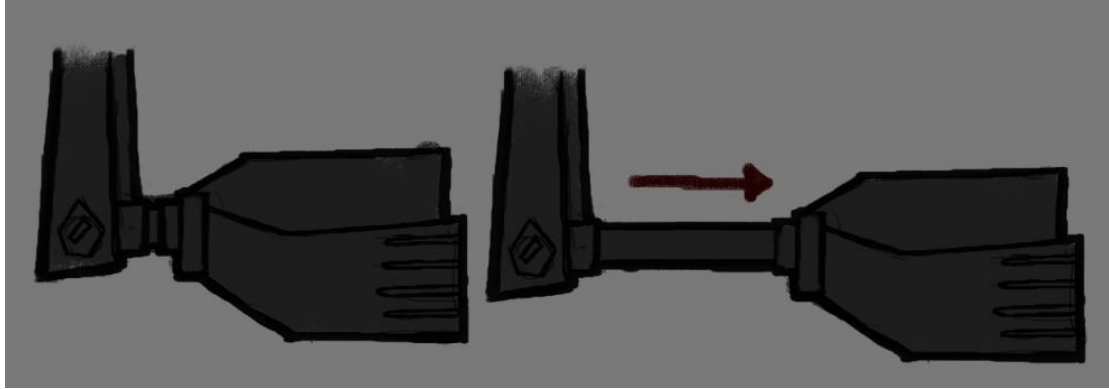
The main characters in the vending machine include various bottles of drinks and also the Grabber. There are three important bottle characters: The main characters Soda and Juice, and the Milk that is grabbed first inside the machine. The reason I chose a soda and a juice as main characters is because the soda gives people the feelings of fashion, energy and adventure, just like a teenage boy, and the curvy shape of Juice conveys tender and gorgeous feminine characteristics. The Milk is the first victim in the film. The reason I chose a milk carton for him is because it feels simple and poor-spirited, and Milk seems more pathetic when he acts like he does not want to die, but he is too incapable of fighting against the Grabber and his destiny.

These three characters all refuse to accept their fate in the vending machine and therefore their design was very important. As I said in the pre-production part, Stephanie and I both thought it was better not to add features to them,

such as eyes, etc. The reason for designing them this way was to allow them to be more realistic and it might also inspire the audience to feel the experience, psychological state and emotions of the bottles.

I began the design process on paper. Doing it this way by hand brought me more inspirations than doing it digitally. The figure of Soda is stronger and more three dimensional to demonstrate his personality traits, such as determination, bravery and straightforwardness. Juice's design, on the other hand, demonstrates her more delicate bearing and her intelligence, which is expressed by the curves in her design. The antagonist, Grabber was designed to convey his executive cruelty in the vending machine. He is merciless, and I thought that designing him as a typical and inflexible mechanical character would convey his terribleness. Also in comparison to the bottles, the Grabber's movements are driven by the vending machine's and are not soft body



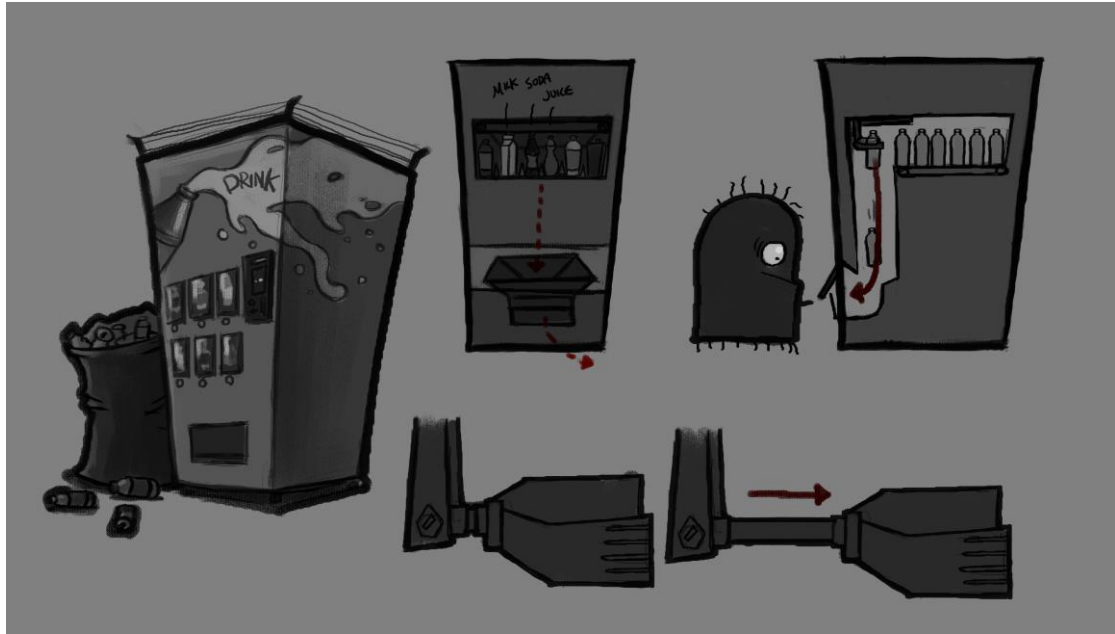


movements. All of these attributes of Grabber's design show his cold-bloodiness and his mechanical nature. As for the person outside the vending machine: Due to the really limited scenes where he is visible in this film, and the need for efficiency of production, I used one of the characters that I had previously designed for another purpose.

## **Environment Design**

The internal environment of vending machine was designed based on its interpretation as being similar to a prison, and the symbolic iron net was also added to amplify this prison feeling.

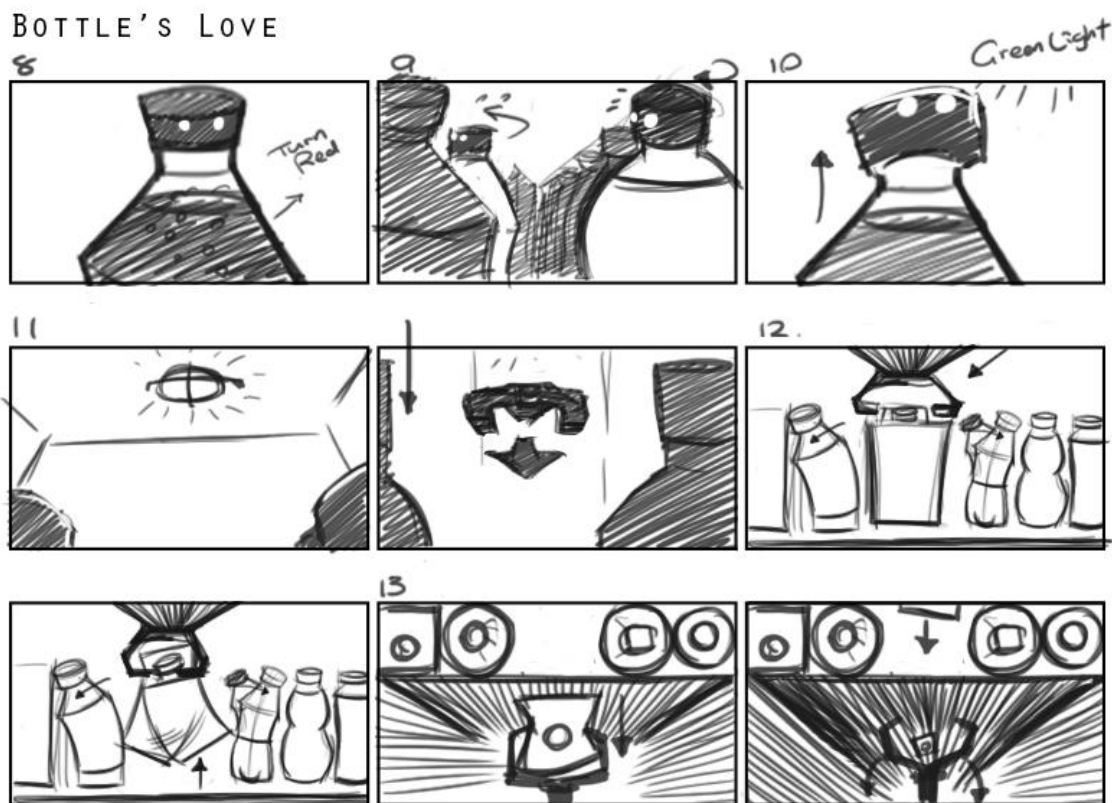
The inspiration for the city and sewer design was New York City. I had taken reference photos of the City, and in addition I used some of the textures in these photos to transfer into the textures on the city visuals.



## Storyboard

In producing the storyboard, many flat camera positions were adopted to tell the story, which give the audience the feeling that they are participating in the story and experiencing the adventure together with the bottles. I added eyes to the bottles in the storyboard to show the direction of the turn or angle of the head/face. The procedure for the storyboards was to sketch out all the scenes with exaggerated camera angles and character movements, to get a strong visual impact. After that, I followed the rules, such as eye-pathway compositing, to refine the scenes. I was really excited when creating the storyboard because I was eager to illustrate the scenes in my mind on the paper, and to see what they would look like. After I finished the drawing of all the shots, I put them into Adobe Premiere and made a rough cut of shots. Then I played this rough cut several times to check if the visual composition was satisfying, the shots were

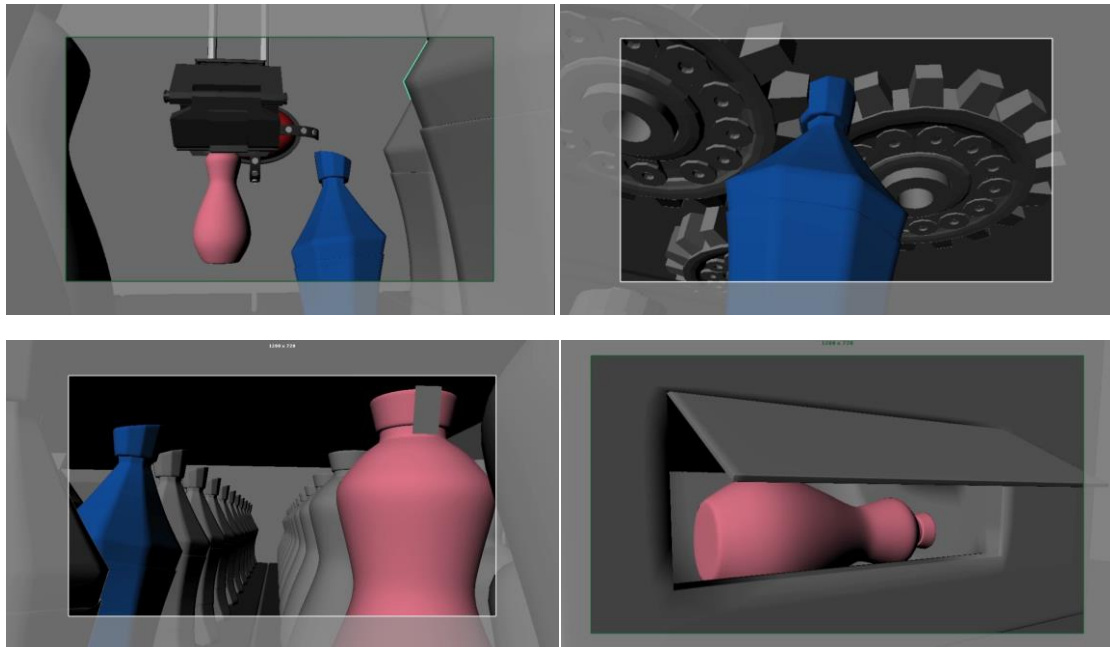
coherent. For instance, if an action shot connects with another action shot well. From my past experience I learned to make the storyboard sequence shorter than a 'proper' timed-out length to make room for the actual animation of the shots. I left other things to the animatic, which is much more important than the storyboard for 3D animation production.



## Animatic

As an animation about an adventure, the animatic is more important than the storyboard. The tempo of the film and the motion of the camera will be easier to control after the formation of the basic visual concept of the film. After the creation of the general animatic, I would correct it and improve it based on these

two points so as to make sure that the camera would move coherently and dynamically while sometimes statically in a balanced way. Therefore, I wanted to apply this in the animation production.



The length of every shot provides important references for the later animation, and also helps to not damage the general tempo in order to achieve the perfect animatic performance.

## Sound

At the beginning of this production, my composer was Michael Pierattini, who was a RIT student and a talented composer with whom I had previously collaborated on two films, *Princess and the Dragon* (2012) and *Mine of Your Business* (2013). But then I went to Irvine, California for a temporary job in March to October in 2014, and in the meantime Michael graduated during my

time away and we lost track of each other. So I asked my friend Ruudy Liu to be my new composer. He is a digital composer and also a Hans Zimmer fan, so I thought he could give me inspiration musically and help me to complete my work.

For the sound effects, Ruudy and I tested many sounds to simulate the environment inside the vending machine. We recorded in a small classroom at night, and we also recorded environment sounds in an old factory in downtown Rochester. After testing, we found that the noisy factory-like environment sounds would be too distracting to the audience at the beginning of the story because the first scene of the film is very relaxed and romantic and we also wanted the audience to focus on the story. After discussions and a lot of brainstorming, we decided to use the echoes of falling bottles for most of the sound effects in the vending machine at the beginning.



# **Production**

## **Introduction to Production**

After finishing the animatic part, the film had developed to the stage of production, which is the most time-consuming and labor-consuming stage of the whole process. This part was composed of five sections, including modeling, surfacing/look-dev, rigging, lighting and animation. The most important and difficult section is the animation. The problem I needed to solve at this stage was how to give life to the lifeless bottles because they have no sense organs or body parts to express emotions like other characters in other animation films. This was a great challenge for me.

## **Character Modeling**

I started to model the characters based on my designs. Generally, only a little change was made to the designs, such as the label on the bottle cap to convey the direction of the character's face. Then I sculpted the models in Zbrush, although they were only bottles, because I wanted to get the 'hand-crafted' feeling with variations in the details of the models, instead of getting perfect-looking computer models in Maya. Moreover, I used Dynamesh to get the quick shapes and sculpt them using Clay brush and Clay Buildup brush. I wanted to keep the imperfect clay-like feeling, which had lots of possibilities, and it also

does not constrain me to focus on the shape and details. I used Polish brush and HPolish brush to refine the smooth surface until I was satisfied with the overall look. Then I exported the mesh to Maya for re-topology with Modeling Toolkit because it has a really convenient quad-draw feature for re-topology. The topological distribution in the modeling takes the motion into consideration so as to avoid the motion problems after rigging.



## Character Surfacing and Look-Dev

For this part, I painted textures in Photoshop. At first, I used realistic images for reference, and painted over on them. In order to avoid that it would look rigid and boring, I changed to hand paint. I exported the normal map and ambient occlusion map in xNormal and also overlaid the green channel of the normal map and multiplied the ambient occlusion map on the texture that I had painted, aiming to get a good albedo map. I created these maps using Marmoset Toolbag. It would take a lot of time rendering. I was glad that the results came

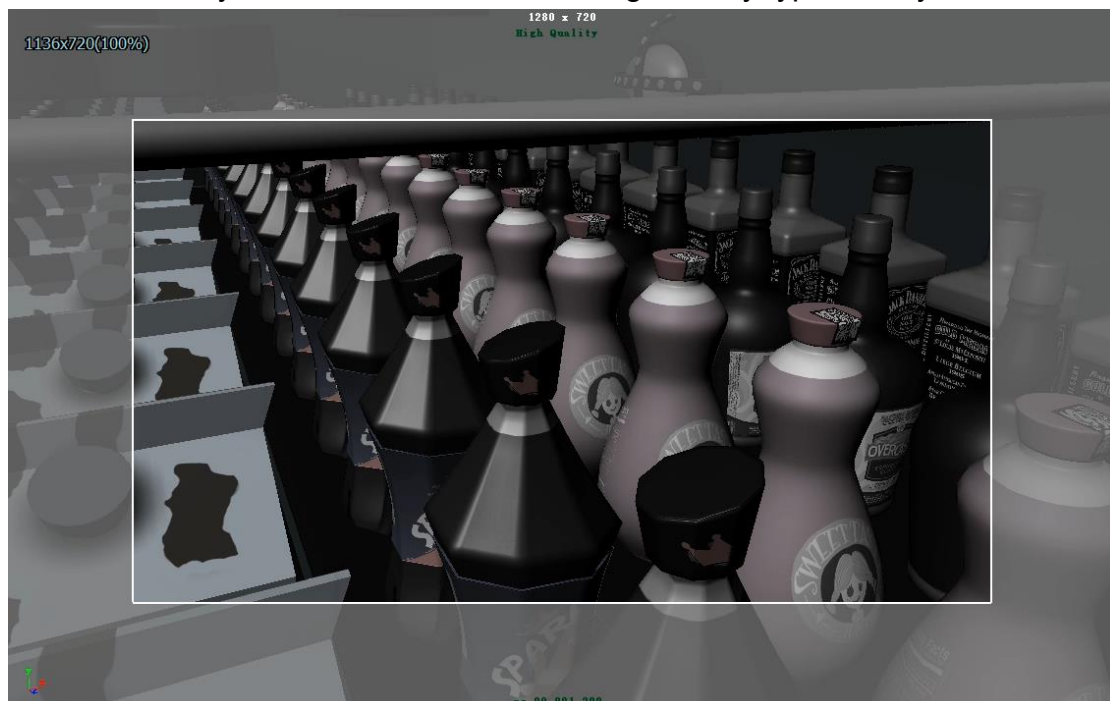


The material effect of Soda and Juice under the real HDRI lighting

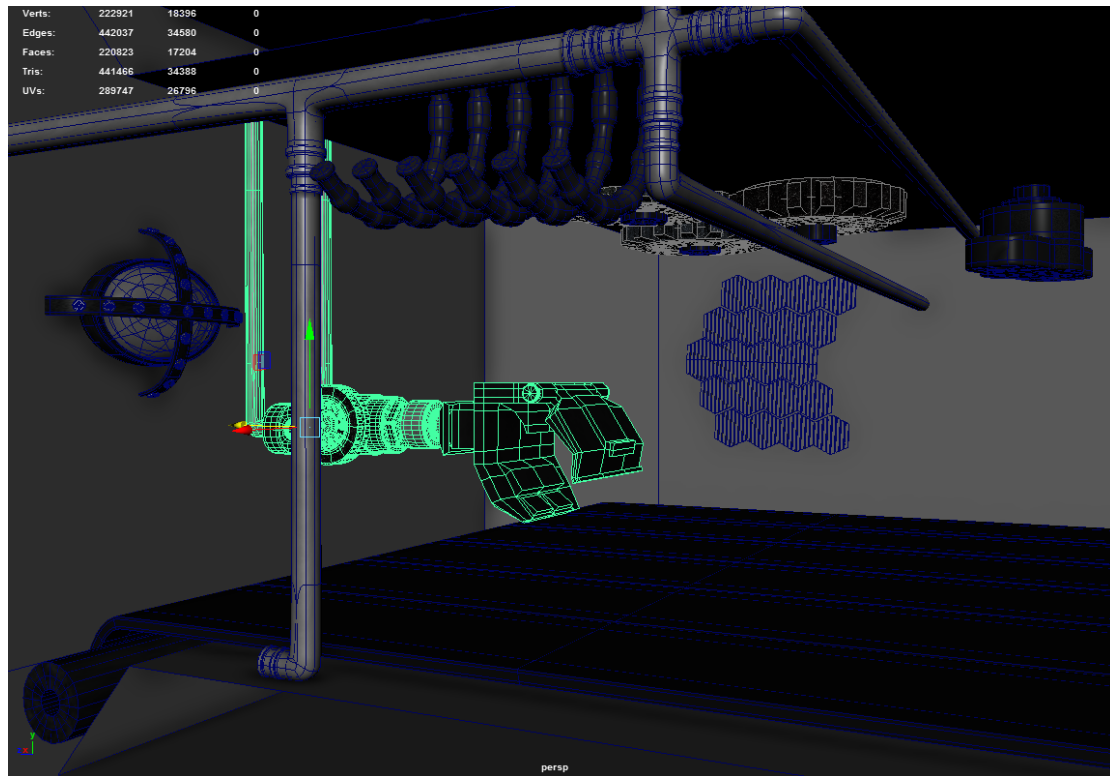
out immediately instead of waiting for an old school rendering engine that takes a long time to personally render. I tested the materials and modified the albedo, glossiness and specular of the materials to make the bottles more realistic. In the testing, HDRI was adopted to simulate real environment lighting to help me figure out the problems of the materials.

## Environment Modeling

Environment modeling was composed of the internal environment of the vending machine and the city and the sewer. The internal environment of the vending machine was designed generally according to its actual state and at the same time to create the feeling of a confined space. I created several mechanical parts in Zbrush, and afterwards combined them into the whole machine in Maya. I used a lot of “Instance” geometry type in Maya, because if



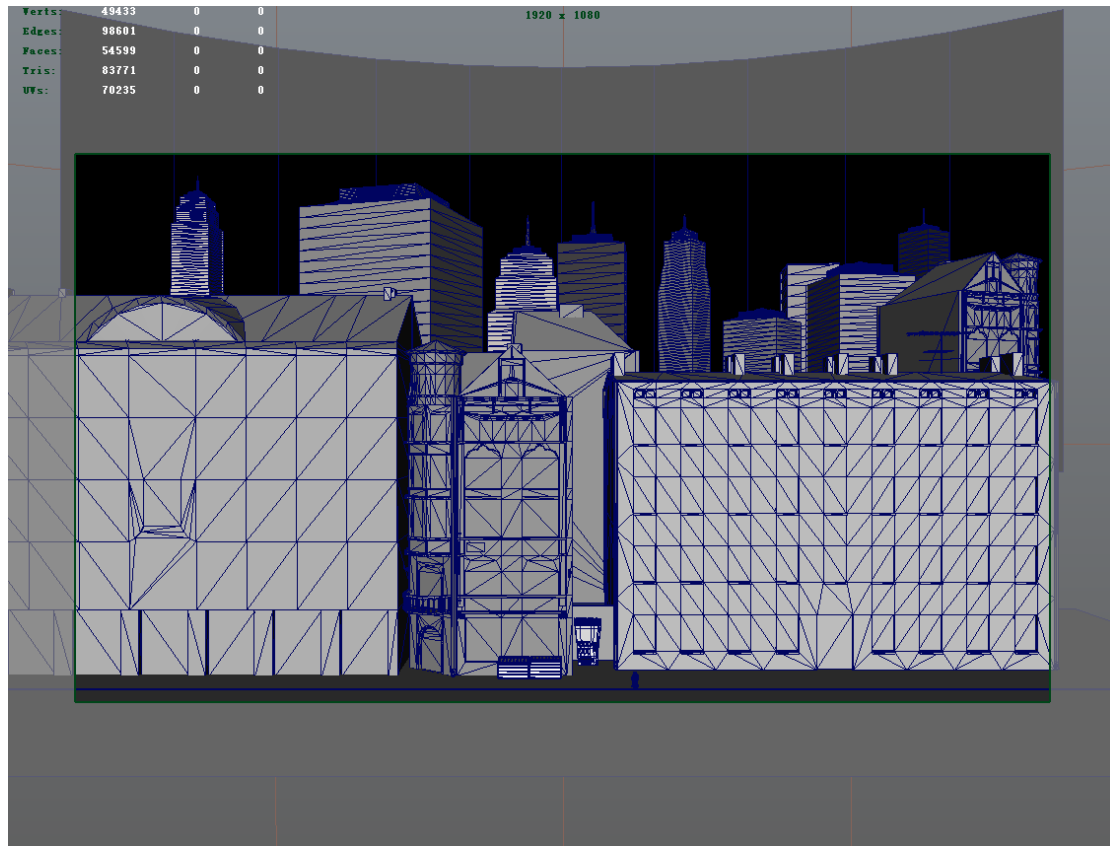
I wanted to adjust one mechanical part later, all the other parts with the same topology would simultaneously be automatically updated. This option made the whole environment more effective, and it also helped me to be able to have a good control on overall feeling.



The vending machine internal modeling

The main modeling of the city was the model of the vending machine and its surroundings, which is exactly the environment in which Soda and Juice live. For the close-up buildings, I created four general models, and then I adjusted their differences. For the background buildings, I used Visor in Maya to quickly create the general feeling and I managed them manually to create variations. However, most of the background buildings are not shown in the final film because of composition considerations of the film set. That was a lesson I have

learned from the production – make sure your animatic is perfect before you jump into the production part and always focus on the things in the camera range.



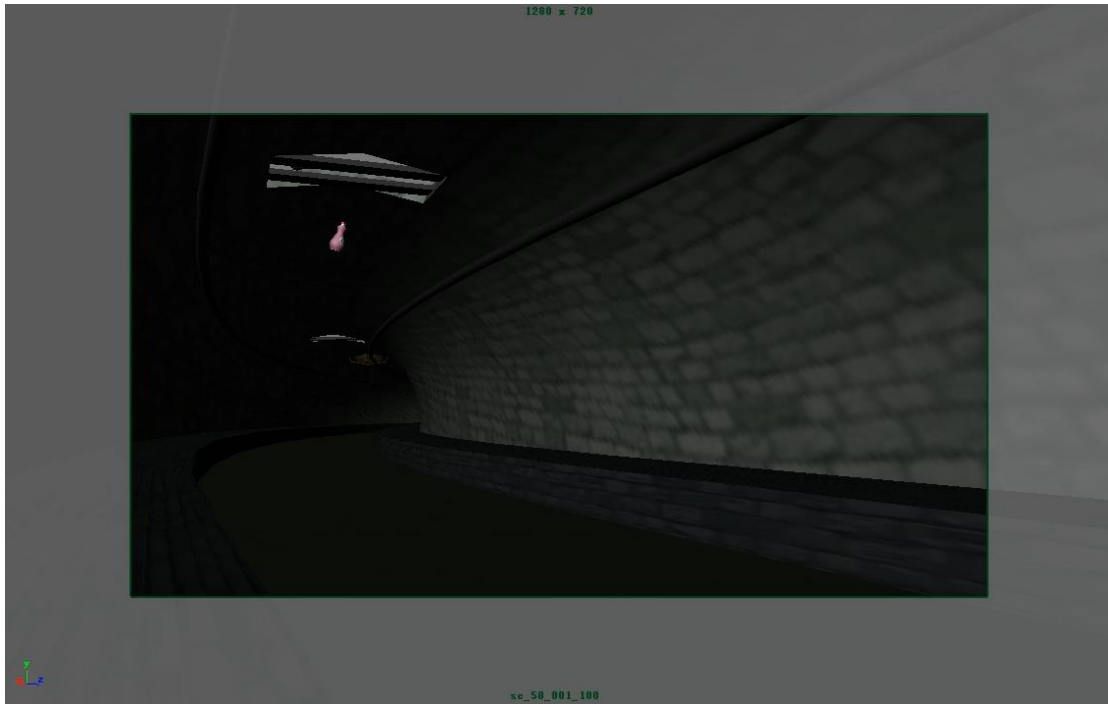
The city modeling

## Environment Surfacing and Look-Dev

By using the contrast between the noisy, filthy human world and the tidiness of the vending machine, an atmosphere of danger is created. To illustrate the streets of New York, street graffiti as well as the colors of red and green were adopted as the main city colors.

The most controversial part was the internal environment of the sewer. At the beginning, I wanted to create a dirty sewer full of cobwebs and rubbish in order to create the sharp contrast of film noir. Due to my concern for visual continuity, and not wanting to frighten the younger audience, I had to give up this idea and try to create a comfortable feeling in the sewer. The light design in the sewer would be introduced as Soda and Juice happily float next to each other. The combination of light and the intermittent sunshine from outside the sewer gives it life and optimism. I utilized realistic references to paint textures in Photoshop. The UV map is regular since the buildings are usually cube shaped. It helped me to project photo references on the mesh. The textures of background buildings are generated in Visor. An HDRI map is used to light up the whole environment.



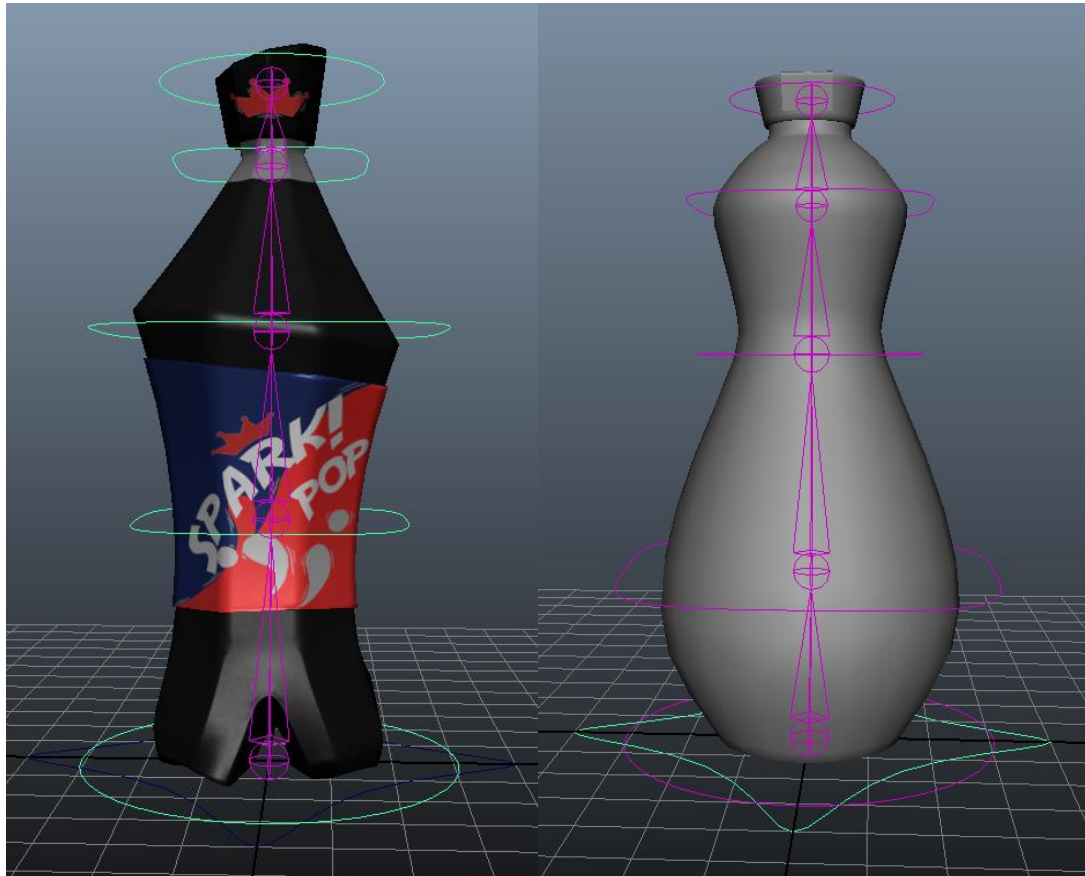


## Character Rigging

Before rigging, I had to consider the various shapes a bottle might present and design it based on these ideas. For example, the spine is of great significance for the main characters Soda and Juice because they have to do complicated rotation motions without arms, legs and sense organs. In order to make them lifelike, their weight must be believable so that the animation is easier to create.

As for other characters, bend linear deformer was adopted rather than skeleton rigging to simulate their motions. There are two reasons: First of all, they have few complicated motions, since in the story the two main characters have accepted their destiny without consciousness; and, secondly, if skeleton rigging is applied to all the characters, the computer will be overloaded, which will in turn influence the whole performance.





## Lighting Ideas

Before designing the lighting, I tested the picture effect and found that film noir was not perfect in 3D animation because the animated characters became hard to identify with the sharp contrast. However, low contrast would create the feeling of a semi product. Finally, the bright colors are adopted and four lighting changes were created along with the storyline.

When they are at first in the “prison” of the vending machine, the sharp comparison between the complementary color of red and green was adopted to create an atmosphere of danger and uncertainty. Since I was using Final Gather render system, the photons on the surface’s color can influence other

objects. Because of this feature, I used plane models with incandescence color to create smooth area lights. It had a better performance than the normal area light, and it was also easier to control in the scene.

In the dispenser area of the vending machine, when Soda bravely saves Juice and they have a private moment of peace, the red light was replaced with the peaceful green.



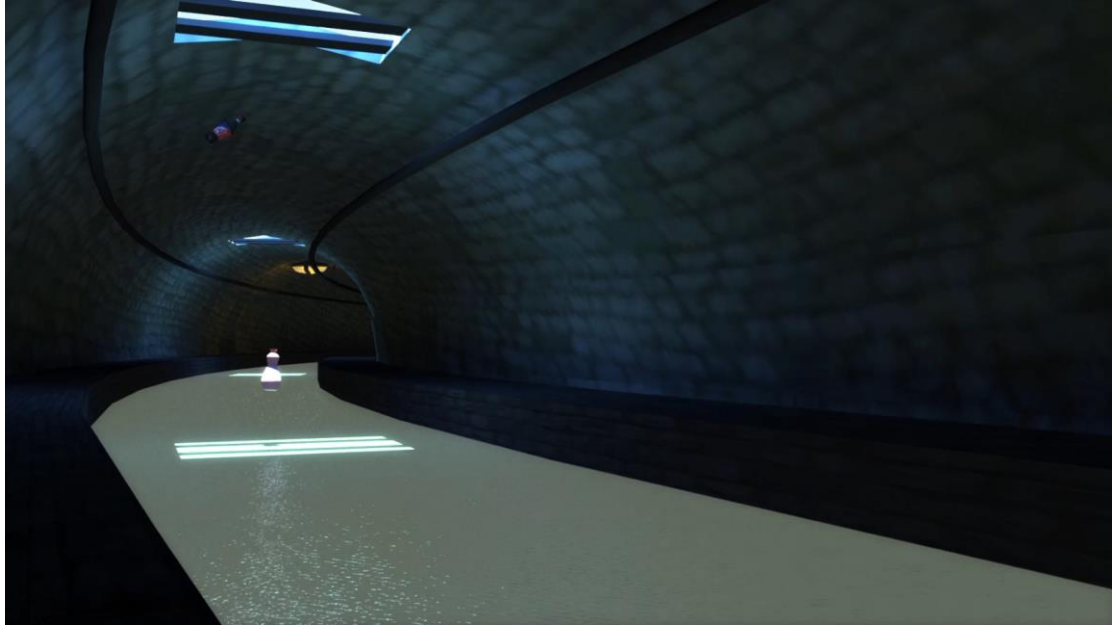
Example of interior lighting

The third lighting change was done when Juice jumps out the vending machine to rescue Soda. Because this is the first time that Juice has left the vending machine and it is also the first time for her to confront human beings directly, the bright sunlight is adopted to create the atmosphere of a 'duel' as in Western genre movies. I applied an HDRI as a physical sun/sky, with final gather to simulate outdoor lighting.



Example of outdoor lighting

In terms of the lighting in the sewer, complementary lighting is also adopted as the main lighting. Different from the vending machine, the combination of the orange light, as well as sunshine on the blue walls of the sewer and the twinkling surface of the water create an atmosphere of hope and beauty, as if they are headed for happiness.



Example of sewer lighting

## **Bringing Inanimate Objects to Life**

Animation is one of the most important stages in the animation film production. The tempo is strictly controlled based on the tempo of the animation. Unexpected frames are used cautiously to avoid causing damage to the animation. Due to the fact that during the animation stage the animator can easily become addicted to the delicate design of the motion, it is easy to shoot many frames on certain motions and make the motion boring. And, it also can break the tempo. The animation of the bottles was mainly manifested in the body because of their lack of limbs and sense organs. I divided the key frame into two parts: The 'purposeful motion' and the 'complementary motion'. The former expresses the purposes of the bottles' motion, such as looking around,

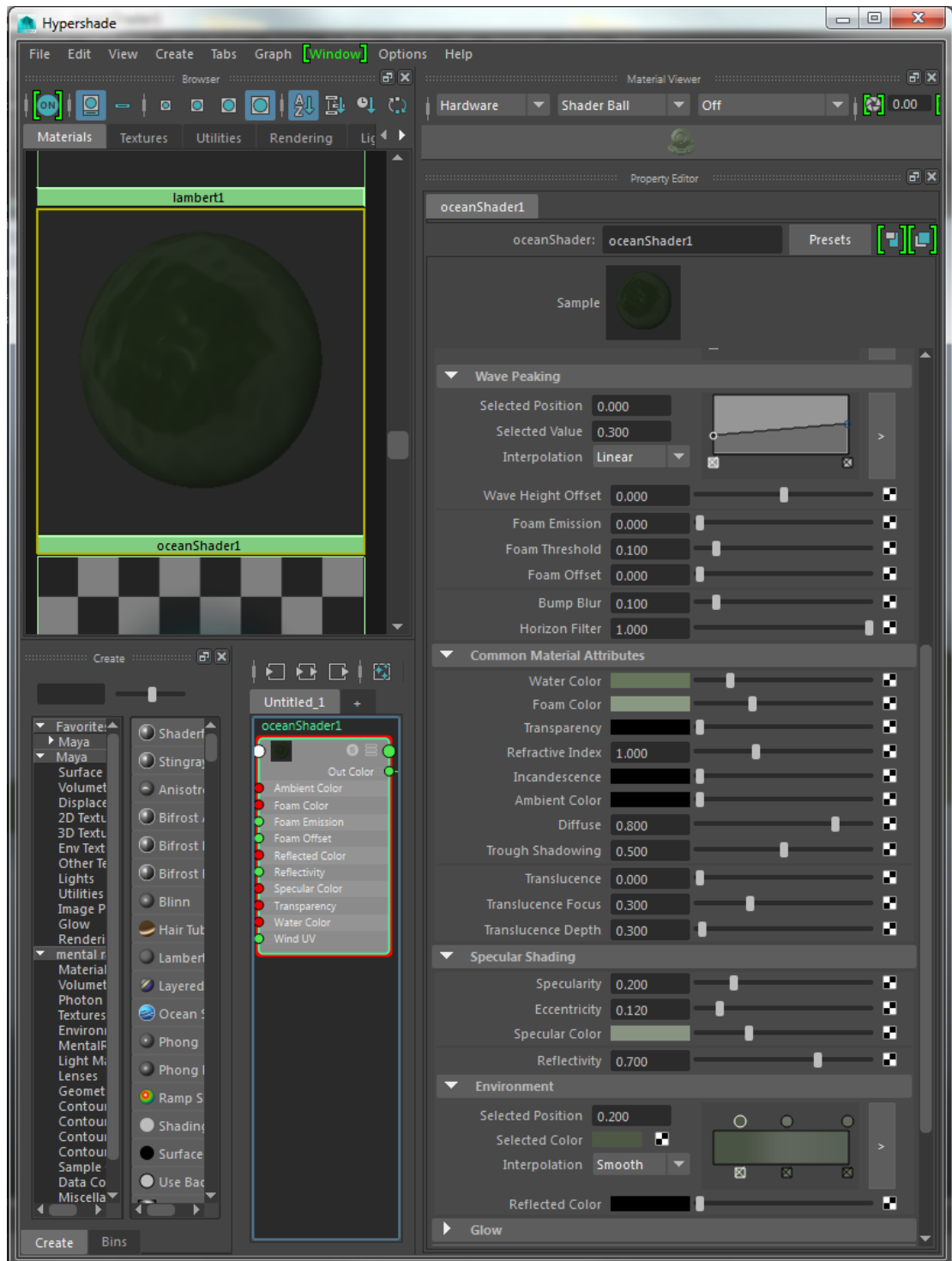
struggling, moving, evading, and so on, which not only contributes to storytelling, but also describes the psychology of the bottles. These motions had a wide range in order to attract the audience to the main characters and separate them from the background bottles. The latter is adopted to show the motion details and emotions of the bottles, such as breathing, uneasiness, the weeping of Juice and the lingering stares by Soda. These give subtle details of motion without affecting the main motion. The priority of the certain motions is important. Otherwise, motions can be experienced as trivial and meaningless.

## **Rendering**

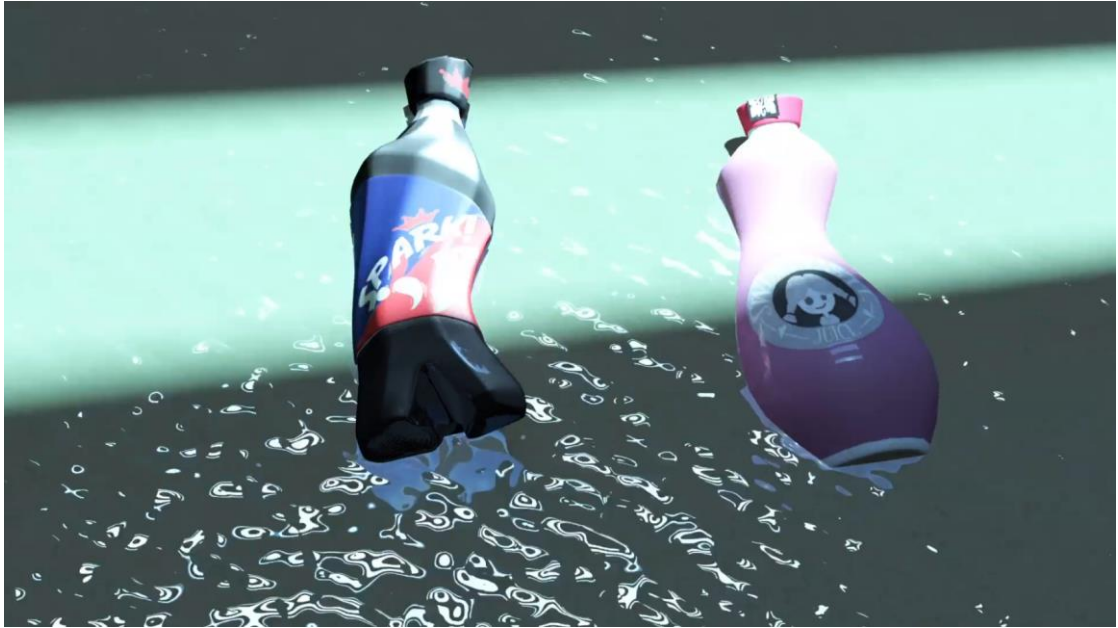
After I finished all the animations, I submitted my render files to the render farm in our department. I also used Mental Ray as my primary render engine, because it has great final gathering and it was supported by our render farm. Then, I found two problems with my render images. The first one was an actual render farm problem, causing a lot of missing frames throughout the image sequences and making it really hard to just re-render the frames. My time was so limited at this moment in the production for any render farm problems, so I rendered each sequence three times, and then merged the three image sequences together. The other problem was that there were light 'spots' on the render images, which was caused by the sampling. To solve this problem, I used the Clone Stamp Tool in Photoshop to fix these light spots manually.

## **Problem-Solving on Technical Difficulties**

The technical difficulty in the film production was the simulation of the water flow in the sewer. It was simulated based on reality where water flows along the sewer and collides with the bottles and enters the turbine, and it would cost a great amount of calculating. It was time-consuming and laborious and the results are beyond prediction. I proposed two solutions: The first one was to take a portion of the water flow to calculate and simulate, and then this portion would be repeated several times to create the whole flow. The longer shots were divided into several short shots because the calculated part was short. But the results were not good, the tempo of the film was broken and the fluidity of water flow was destroyed. Finally, the second solution worked, which was to simulate the water material with a shader. I modified Ocean Shader in Maya to make it more similar to water flow in the sewer. Another lighting is added to the shader to simulate the sunshine on the flowing water. Thus, I simulated the light of sunshine on the water surface through the drainage openings and on the shadows of Juice and Soda when they pass through this lighting scheme and create the feeling of progression. By this method, a realistic water flow was simulated, and it would save a lot time and avoid the possibility of rework.



The attributes of Ocean Shader



The material of water and effect of light and shadow



# Post-Production

## Sound and Music

The music was composed by my friend Ruud, who experienced a lot of the pressure of finishing this movie with me, even though he was very busy. The music he created was very well conceived and produced. He adopted ProTools to create the atmosphere of danger and the sense of extreme stress in the beginning and middle parts of the film, which was perfect. In the last part of the film, the music is relaxed and airy and adds more radiance to the film.

The main difficulty in the sound design was the simulation of the unique sound effects when the Grabber appears. In order to show Grabber's cruelty, the background music could not stand alone. After a lot of trials, we finally got inspirations from the sound effects of the appearance of Reaper in the computer game *Mass Effect*. We adopted the sound of mechanical grating to simulate the sound effects of Grabber, and the results are quite ideal.

## Compositing

My compositing was mainly performed using Adobe After Effects. The technique I adopted was mainly the color modulation and the softening of the rigidity created by 3D. In the scene of the city and the sewer, I modified the

strength of sunshine to make it more realistic. Then, I transferred the finished images from the sequence to Adobe Premiere to match them with the music and sound effects. During the matching of music and sound effects, I tried to maintain the stability of the sound effects while I added other effects, such as fade-ins, fade-outs, and the echo of the bottle falling into the vending machine dispenser.



Before and after compositing

## **Fine Edit**

After compositing, Stephanie and I worked on the final to tedious parts and make some improvements. We also focused on the continuity of shots. If the same character is in the following shot with similar camera view, we will edit these shots to make sure the character is in the same position, and so on. Otherwise, the audience will experience inconsistency and discomfort with the film.

## **Release Formats**

After the final edit, the length of the film was 4 minutes 45 seconds. The output format is MOV H264. The frame rate is 24f/second and the resolution ratio is HD720P, which is 1280px 720px.

## Conclusion

I learned so many things during the production of *Love Sip*. This work represents the techniques that I have mastered during my study at RIT. Moreover, I am very satisfied with this film, and I believe it expresses the idea of love and courage perfectly. It is the high point of my education of three years at RIT and it introduced me to new patterns of thought, new narrative methods, a wide range of production techniques and the importance and control of film tempo. The laughter and positive comments I received at the end of SOFA screenings were really a comfort to me. I saw the advancements I had made under the guidance of my teachers and with the help of my fellow students. The comments and advice after the film let me know that there is still a long way for me to go in terms of animation. Other comments made me aware that I need to still work on the storytelling, especially in the end scene in the sewer. I received a lot of encouragement and confidence on the whole script, which means a lot to my future career. I found a clear direction. Graduation is just the end of a short and amazing journey and there is still many things awaiting me to explore. During the production, my supervisor Stephanie always helped me correct problems in my shots and the narrative. After one year's effort, we transformed a simple but never-faded idea to a lovely and innovative film. My committee Mark and Skip patiently helped me to improve my graphics and the storytelling.

I have learned so much about the techniques and the different spirits of animators. They are the wonderful people I truly appreciate. I hope that this animation is not only a happy ending of my study in RIT, but also a starting point of a new journey into my future.

# Appendix

## Appendix A - Original Proposal – Aug, 2013

### Working Title: Love Sip

#### *Story*

In a darkened and very noisy room, beverage bottles stand silently in lines facing forward like soldiers. There is small red light at the front of the room that sheds light onto them. Sometimes with a “beep”, the red light turns green and a line of bottles will move forward a little accompanied by the sound of a machine rising up during the movement.

A blue Soda bottle is standing 4<sup>th</sup> in one of the lines looks around curiously. He cranes his neck forward looking towards the front rows of the bottles. However, the bottles closest to him are blocking his view. As he turns his head right and left his sight locks on a bottle of strawberry Juice in the next line over and ahead of him. He admires the physical curves of her bottle and the pink packaging.

Juice becomes aware that she is being watched. She turns her head and finds Soda staring at her. Soda immediately looks in another direction and his bottle turns red very briefly. Juice giggles at the sight of him and then resumes facing stiffly forward in her line. Soda smiles to himself and then looks at Juice and begins admiring her again.

Suddenly, the red light turns green and Soda's line is moved forward closer to the front and to the red light. It happens again and again, but he does not notice, as he is lost in admiring Juice. But, the spell is finally broken and Soda is now and he becomes excited and a little nervous. There is only one bottle in front of him in his line – a bottle of Milk. But the bottle of Milk turns back and looks at Soda with an expression of horror. Suddenly, the red light turns green and a black metal hook clamps onto Milk from above and throws him into a big dark hole at the very front of the room. Milk's screams can be heard echoing down the dark hole. Soda's line is moved forward and Soda is now at the front at the edge of the hole.

Soda stares into the dark hole in front of him looking for Milk, and eventually the in the darkness the front wall becomes translucent and the silhouettes of moving shapes (human beings, buses, cars on a busy street...) are seen beyond the wall. The noises increase (voices, engines, traffic...) as he focuses his attention on this world beyond the wall. He suddenly gasps. He sees see lots and lots of empty and broken bottles on the ground and in trash bins. He screams and tries to move away from the front of the line without falling into the hole, but he cannot move away.

Suddenly, there is another scream and he looks to Juice's line where she has also advanced to the front row and has witnessed the bottle in front of her being

sucked down into the hole. She is crying and looks at Soda with an instant expression of despair.

In the meanwhile, a Girl arrives at the beverage machine outside. She is deciding which drink she wants to buy. She drops in coins and makes her choice. Inside the machine, the light turns green; the black hook rises up and moves above Juice. Juice shrinks back in fear as the hook approaches her. When the hook is about to clamp on her, it suddenly stops moving. She sees that Soda has jammed the top of his head onto the gears of the hook to stop it. The gears make severe grinding sounds and Soda is quickly becoming dizzy and tired with forcing his head against the gears.

The girl outside the machine begins pounding loudly on the machine. But, then the Girl drops more coins into the vending machine and pushes a button again. This forces the hook and gears to suddenly move and Soda falls to the floor and rolls onto his side. Before he can react the hook moves directly above Juice and grabs her head and moves her to above the black hole. Soda jumps into the dark hole at an angle and blocks it with his body. The Hook releases Juice and she falls right on top of Soda. Soda gives Juice a big smile, and she rests her head thankfully on Soda's body.

The girl outside impatiently waits for her drink to be delivered. Inside of the machine, Juice moves out of the hole and waits for Soda to climb out too. But, the girl outside the machine suddenly starts shaking the machine and this



causes Soda to fall down the hole. The girl outside takes Soda from the machine's dispenser and tries to open the soda bottle. But, Soda resists this opening. Meanwhile, Juice has jumped into the hole after Soda and lands in the machine's dispenser. She sees the girl trying to twist the head off Soda. Juice then jumps from the machine onto the ground and rolls on her side to the back of the girl's feet just as the girl is turning around. The girl trips on Juice and Soda goes flying out her hands onto the ground and both Soda and Juice start rolling towards a nearby sewer together.

Inside the sewer, they fall into the water and begin floating together down a sewer channel. Soda and Juice look at each other, exhausted, but full of love. They relax in the water floating side by side. Then, a huge machine noise rises up. Soda and Juice look ahead of them and see a giant turbine violently chopping at the water ahead. Soda and Juice look at each other and smile.

### *Technique*

This work will be created using 3D animation and will experiment with watercolor textures. Sound will consist sound effects and music combined.

	Aug/13	Oct	Nov	Dec	Jan/14	Feb	Mar	Oct	Nov	Dec
<b>Pre-Production</b>										
Character Design	Orange									
Storyboard	Orange	Orange								
Visual Development		Orange								
Character Modeling			Orange	Orange						
Environment Modeling				Orange						
Texturing & Shading				Orange						
Rigging				Orange						
<b>Production</b>										
Pre-visualization					Green	Green				
Animation					Green	Green	Green			
Special Effects							Green			
<b>Post-Production</b>										
Lighting						Green	Green			
Rendering								Dark Blue		
Compositing									Dark Blue	
Sound Effects									Dark Blue	
Music								Dark Blue	Dark Blue	
Credits										Dark Blue

	Qty	Cost	Total
<b>Pre:</b>			
<b>Art Materials</b>	-	-	\$20
<b>Reference Books</b>	3	\$30	\$90
<b>Research DVDs</b>	3	\$20	\$60
<b>Prod:</b>			
<b>Computer Software</b>	0	\$0	\$0
<b>Computer Hardware</b>	0	\$0	\$0
<b>Hard Drive 1TB</b>	1	\$100	\$100
<b>Post:</b>			
<b>Music Composers</b>	1	\$300	\$300
<b>Music Recording</b>	1	\$100	\$100
<b>DVDs for burning</b>	15	\$4	\$60
<b>Festival Fees</b>	-	-	\$200
<b>Contingency</b>	20%	\$186	\$186
			<b>Total: \$1116</b>

*Time Line and Budget*

## School of Film and Animation Graduate Thesis Contract

Proposal Title Bottle's Love  
Student Tianshu Liu  
Committee Chair Stephanie Maxwell  
Committee Member Mark Reisch  
Committee Member Skip Battaglia

Type of Project: Narrative/Documentary/Animation/Experimental/Script 3D

Discussion Notes:

Maybe have animatic ready for animatic.  
Try to bring deadlines forward.

Approved

Date for Resubmission \_\_\_\_\_

Not Approved

Project to be Completed By \_\_\_\_\_

Conditions of Approval:

Ø

Committee Chair (or  
Dept. Chair) Signature \_\_\_\_\_

Date 9/10/13

*I accept that the above is an accurate record of the conditions of approval of my Graduate Thesis. I am aware of the complete screenings policies as detailed in the Screenings Committee document. [fvasa.cias.rit.edu/docs](http://fvasa.cias.rit.edu/docs)*

Student's Signature \_\_\_\_\_

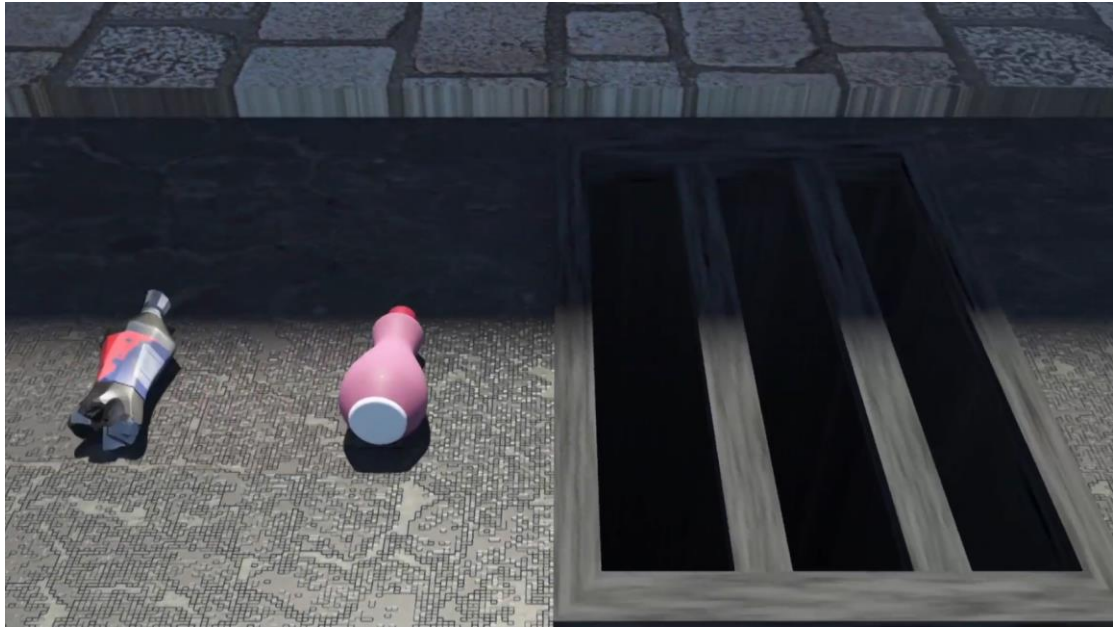
Date 9/10/13

*Thesis contract*

Appendix B - Images from *Love Sip*



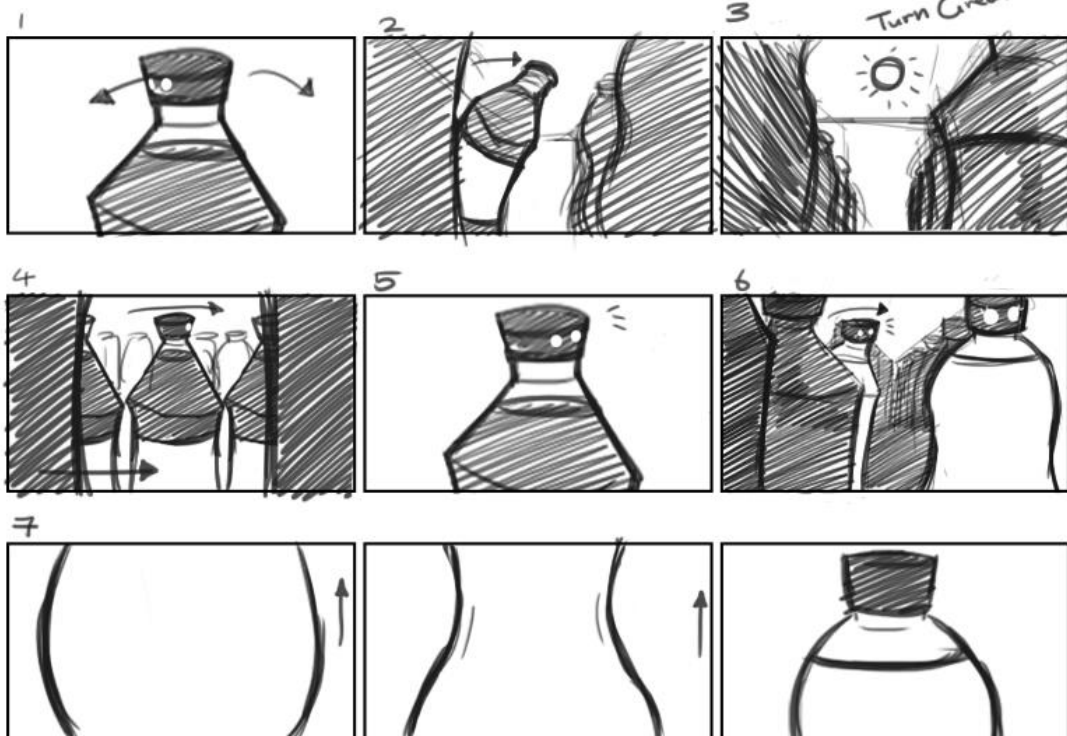




## Appendix C - Storyboard

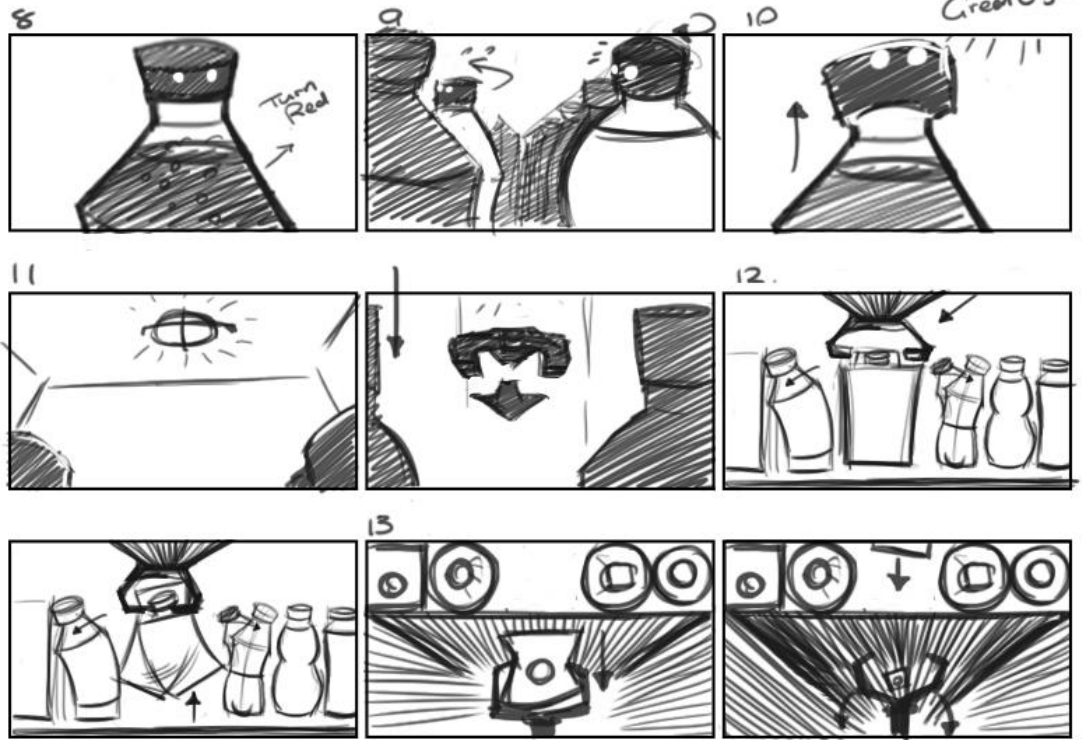


### BOTTLE'S LOVE

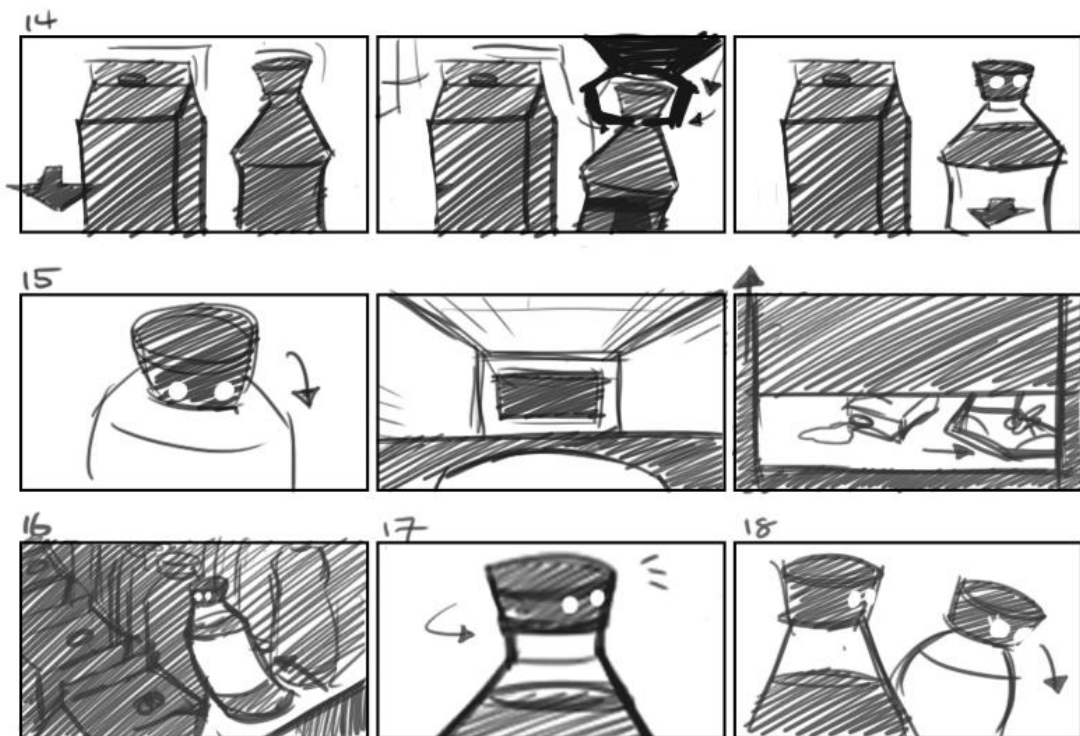




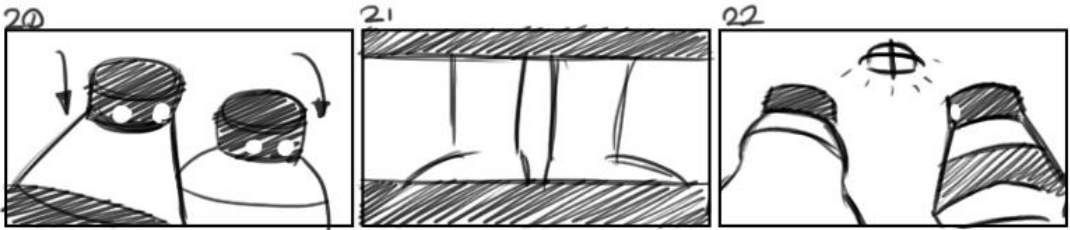
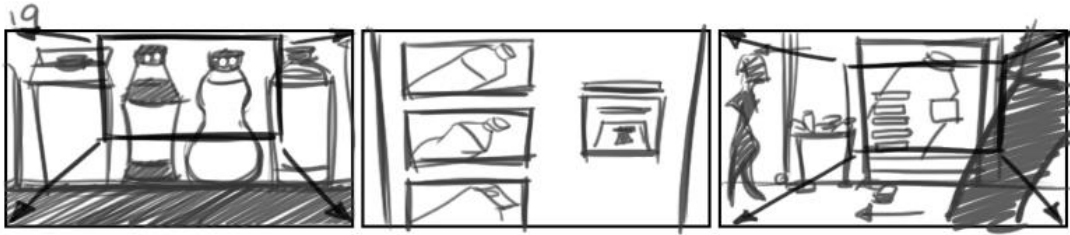
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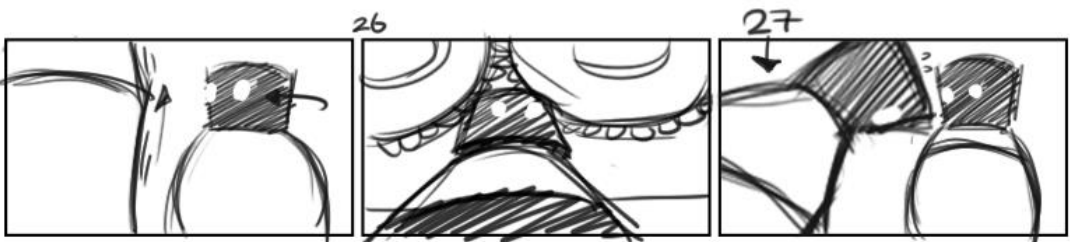
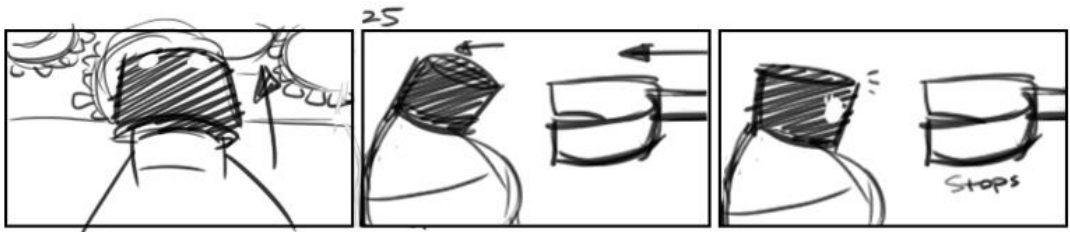
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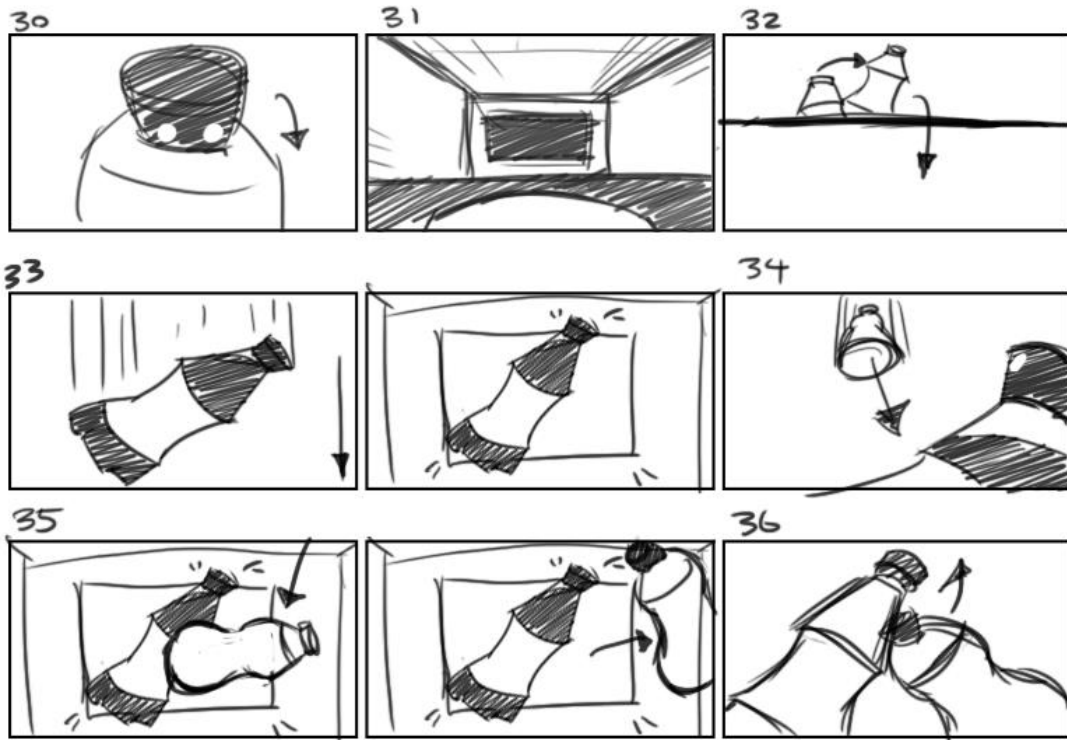
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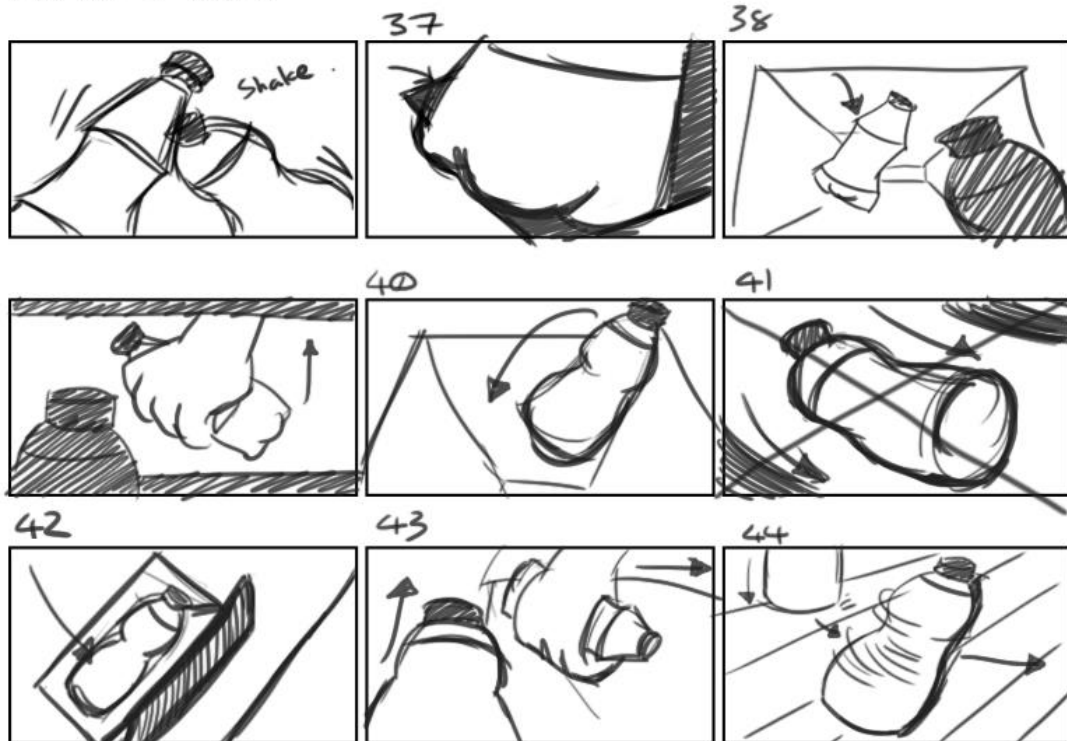
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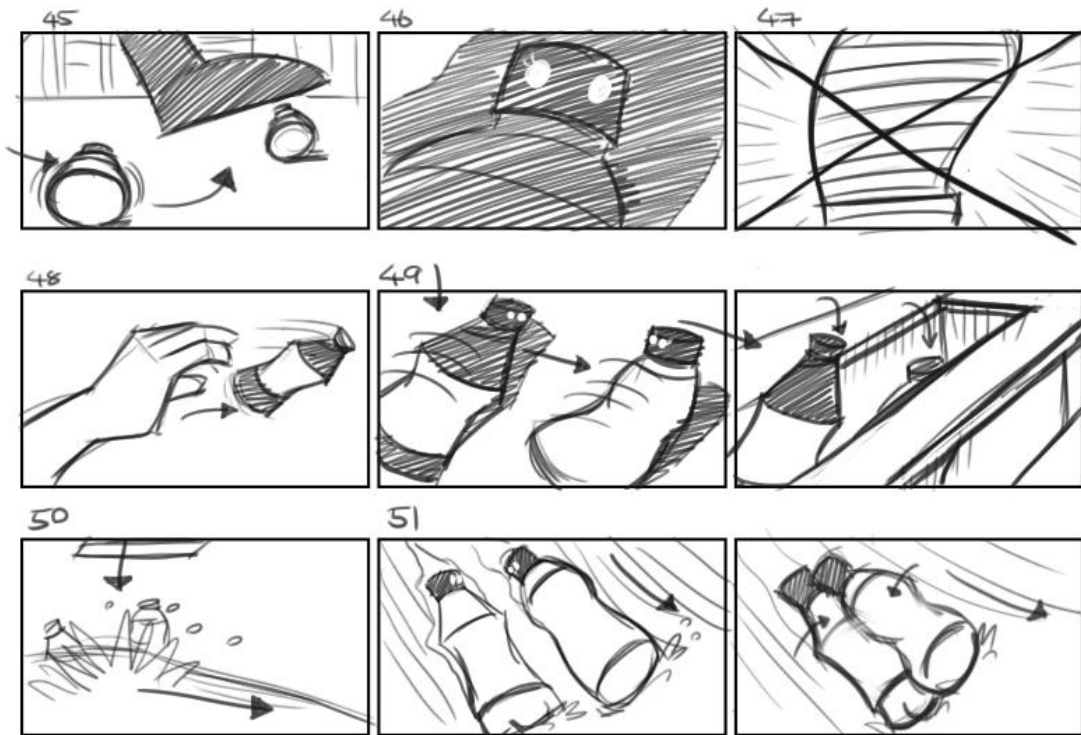
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