

Calligraphic Line Animation

Ahmad Ghourab

08/03/2008

Contents

I	Pre-Production	3
1	Introduction	4
1.1	Abstract	4
1.2	Brief	4
1.3	Background Information	4
1.4	Motivation	5
2	Aim	6
2.1	Design/Create the Tools	6
2.2	Animation Implementation	6
3	Design	7
3.1	Preliminary Research	7
4	Animation	9
4.1	Concept	9
4.2	Aesthetic	10
5	Tool Design	13
5.1	Brief	13
5.2	First Method	13
5.3	Second Method	15
II	Production	17
6	Animation Methods	18
6.1	First Method	18
6.2	Second Method	19
6.3	Tool Revisited	20
6.4	Third Method	21
6.5	Final Method	22
7	Implementation	28

III	Analysis	30
8	Analysis	31
8.1	Where the project succeeded	31
8.2	Where the project failed	31
8.2.1	The Animation	31
8.2.2	The Tool	32
8.3	Expanding the project	33
8.4	What I learnt	34
8.5	What I would do differently	34

Part I

Pre-Production

Chapter 1

Introduction

1.1 Abstract

CG animation is usually thought of as being the process of animating a character composed of limbs, bones, joints and other being like attributes. However, animation is by definition enlivening an object or character, from a state of stillness to a state of transformation.

For my innovations project, I decided to create an animation composed of 2 characters made of 'calligraphic lines', who fall in love and decide to give themselves to one another for an eternity. In the process, I would have researched, attempted, and developed a method, technical process, and a better understanding of how to animate characters with no facial or bodily features, which could then be used to animate lines of all sorts.

1.2 Brief

I envisioned this project one day, while drifting off to sleep, in the almost asleep state of mind. I made a mental note of the idea, before giving away to the bed bugs.

My initial idea centred on telling the story of how my wife and I met, and how our relationship progressed, in the most personal way possible. The objective was to create a piece of animation intended for an Arab audience, developing upon already created Islamic art, and animating it to give it a soul that the audience can feel in touch with.

1.3 Background Information

Arabic calligraphy has been for centuries the main artistic export of the Middle East, which has little else to offer in terms of fine art. Middle Eastern art is usually impersonal, whereby the artist paints predefined calligraphic messages



Figure 1.1: ‘Bisimillah Al Rahman al Rheem’, a common islamic phrase meaning ”‘In the name of god, the most gracious the most merciful”’

(e.g. The name of God(see Figure 1.1), his prophets, or famous Islamic phrases), in a style usually set by calligraphic artists of early Islamic states.

1.4 Motivation

One of the main motivations for my innovations project was to further an art that I have long admired, into a character with a soul. By giving the calligraphic symbols a soul, I would have shown that even when the artist cannot depict faces, or bodily features, they can still create a character with a soul, and thus open a doorway for self expression.

Chapter 2

Aim

To create a calligraphic line animation depicting my relationship with my wife

2.1 Design/Create the Tools

There are no line animation tools, so perhaps the main component of this project would be to design and implement a tool that could be used to create line animation. As part of the design, I would like it to be flexible so that others could use it at a later date. I would also like it to be capable of adapting to different forms of line animation (for example, instead of Arabic characters, it could just as easily use English characters, sprites etc)

2.2 Animation Implementation

After completing the creation of a tool, that would allow me to animate a calligraphic line, I would then need to experiment with it and create a short animation, demonstrating its use, or methods by which one can use it to achieve the desired emotion or state. The animation is the final stage of the project, the conclusion, and where I can become most critical of my work.

Chapter 3

Design

3.1 Preliminary Research

Most of the work I have done on this course has been of a very technical nature, and while I do not regret that, I would like this project to be of a more artistic nature, albeit the technical process used to achieve it.

My first inspiration for the project had been the cartoon series 'Pink Panther'(Figure 3.1). The very first episode was a series of battles to repaint a scene pink and blue(Figure 3.1), and I was inspired by the fact they could tell a story with such simple elements. Furthermore, the series was 100 plus episodes, all with a very similar theme, and similar defined elements, yet it could be done without being seemingly too repetitive,.

That inspired me to design my project with simplicity in mind. Any idea that sprung to mind that involved complex cinematographic rules, a multitude of characters, or a detailed environment where instantly ruled out. I was more interested in a very minimalist project in that I have one camera movement, one scene with little or no detailed environment, something that remained abstract.



Figure 3.1: *Pink Panther(Left) battles to paint the environment Pink, as Inspector Jacques Clouseau(Right) tries to keep up by painting it all Blue again*



Figure 3.2: *A montage made up of a series of screenshots at regular intervals from the video 'Lifeforce' by ASD*

I gained more inspiration when I watched a video called 'Lifeforce' by a team called ASD (figure 3.2). A minute and fifty seconds into the video, a brightly coloured and contrasting rainbow begins to twirl around the screen (figure 3.2, top right image), as each of the coloured lines splits off, choosing its own path, I felt that they had become separate characters, and that I could probably further it so that they can become separate characters with souls and a personality (which the rainbow lacked). I had initially referenced this video as an inspiration for my animation's aesthetic, as again I liked the contrasting simple geometry.

Chapter 4

Animation

4.1 Concept

The initial concept was to have a plain blue line, that moves in one direction on the screen, and at a later stage interacts with a pink line, that moves in that same direction. Other than both lines, the environment would be empty, apart from a very lightly textured white or black background.

The characters would go through a set of emotions that are as follows (Where (M) signifies the male, and (F) signifies the female):-

1. (M) Intrigued
The blue line is moving at its own pace, before being shocked by the presence of the pink line, which he begins to observe
2. (F) Shy
Once made aware of the observing blue line, the pink line begins to express her shyness
3. (M) In love
The blue line expresses his new found love for her, by zooming around her, or making heart trails
4. (F) Agreed
As the blue line expresses his love, she slowly begins to fall into rhythm with him, expressing her approval
5. (M) Union
At this stage, the two lines become two halves of the same entity. The axis of rotation becomes the centre point between the two of them, and they move in sync with one another.
6. (F) Celebrate
They celebrate this notion of unity by playing with one another. This could be some form of teasing, getting closer, then more distant etc

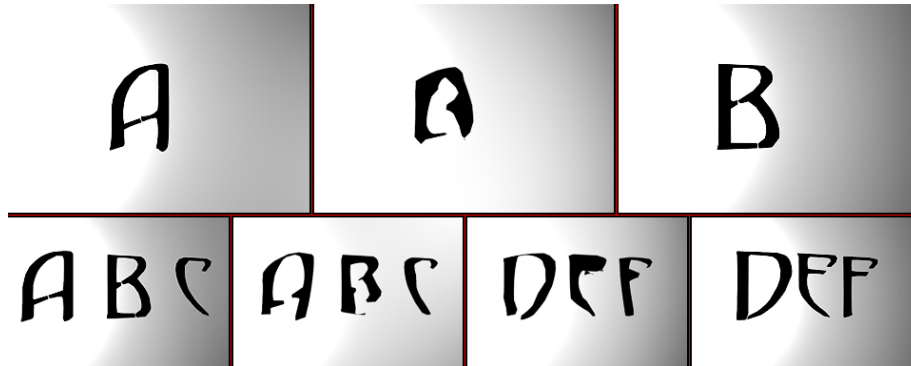


Figure 4.1: *Blending between single letters works fine, however merely increasing letter count by two begins to produce errors*

7. (M) Forever
As a final closing emotion, the blue line breaks off, and speeds into an eternity symbol.
8. (F) Together
The pink line then joins the blue line to complete the sentence, Forever Together.

4.2 Aesthetic

The problem with the earlier model would be that it does not touch upon the calligraphic line concept, nor does it fulfil the aims I set out to accomplish. The reason being of course was to have a framework to build upon. With the basic idea completed, and the general sequence of events mapped out, I could then begin to think up ways of representing animated calligraphy

My first aesthetic method was to have morphing letters, superimposed onto the lines (figure 4.1). The letters would mould from one message to another. Technically, this was difficult as Arabic letters change depending on what letters precede it, or come after it. When testing this in Houdini, it resulted in severe errors whereby when one word moulded into another, some of its letters panned across the screen, while others shrunk to oblivion (figure 4.1). It was clear that to create it technically was possible, but not in the time frame allotted, nor with my current expertise.

From an artistic perspective, having super imposed letters meant that they were separate entities, that they didn't really have a life of their own, and that they were not the character itself, the line was.

My second aesthetic method was to have a line that itself morphs into calligraphic words at various points in the animation. For example, when the line

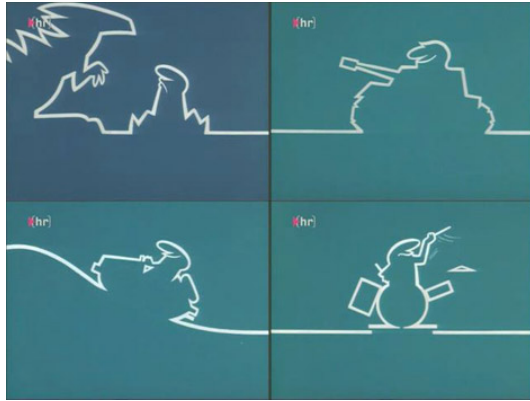


Figure 4.2: *Four screenshots from a single episode of 'La Linea', which shows a line character morphing between different elements to complete a storyline*

was displaying signs of love, it could dance around and then split into several lines that make up the word "Hub", Arabic for love.

The problem with this was not a technical one, were it could be done with a bit of help from compositing, but more so that the character was not calligraphic, but was more elemental in that it could morph into Arabic calligraphy, which also meant you would expect it to morph into a variety of different objects.

That has already been done, a good example is the French 'La Linea' ('The Line') animation series (figure 4.2), which is an animation featuring a line that morphs into a character, and can be extended into any shape desired when a hand comes into screen to draw the extra required elements.

My third and final method was to have a single point, representing the head of the character, emitting calligraphic letters. This was inspired by Syrian artist Khaled Al Saai's work, which is a contemporary form of calligraphy that focuses less on the actual meaning of the letters, and more on the artistic interpretation. His work has a free flowing and very light feel to it. That inspired me to create something along those lines. I felt that by looking at figure 4.3 it felt like it could be both animated, and given a character and a soul of its own.



Figure 4.3: *'Galaxy', by Khaled Al Saai. Named 'Galaxy' because "of the light in the painting and the movement of letters"*

Chapter 5

Tool Design

5.1 Brief

The tool design stage was one of the more troublesome stages, which had me return multiple times to layer new features onto the old tool to accommodate for more emotions and movement.

I found that it is impossible to design a tool from the ground up for such a vague form of animation without first attempting to animate with a basic form of the tool to discover what would be useful or necessary to complete the animation.

5.2 First Method

The first tool I created allowed the user to input a single curve, which the tool would then feed into a network that would delete all the points. The user would then have to use a slider to undelete points in order. Each point that comes into existence would have a set of letters instanced onto it, and each instance would assume a different variation of the color blue, depending on the point number, or the time stamp at the time of creation.

I wanted to implement the color scheme found in Khaled's work that I mentioned earlier. That would involve multiple layers, where the letters further back would be larger, and would have a lighter color (e.g. Blue at front, Yellow at the back). Easy enough, you could simply layer a letter (or set of letters) onto the point. Then copy several sets of letters back in space, and by referencing the copy number, you could write an expression where 'As copy number increases, color lightens (RGB values get closer to 1)'.

Cons

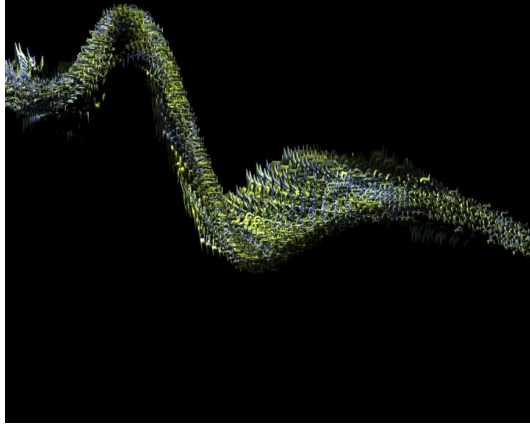


Figure 5.1: A sample render from the beta version of the font curve tool. This shows one curve, with letters instanced on every point, being duplicated multiple times, eachtime being offset further into the background

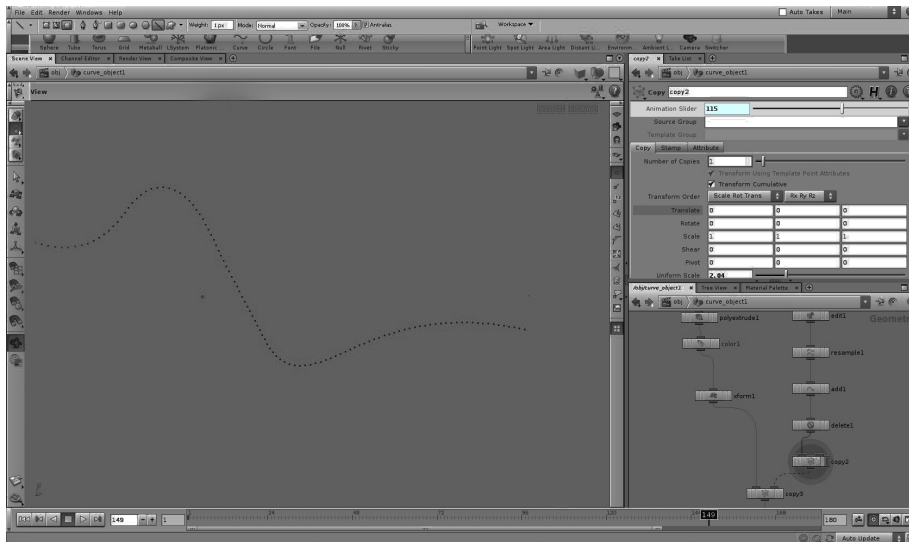


Figure 5.2: The early tool from within Houdini. Notice the only animatable parameter was a point undelete slider

But that design had a number of problems. For one, the points don't have an age, nor do they have a unique ID. Operations such as making the color fade depending on age were impossible, and applying forces to the points were impossible as once the data is fed into a particle system, sending data upstream no longer works, and the delete/undelete points to animate a curve into existence no longer functions. In brief, the tool dies.

However, the point where I decided to redesign the tool was when I realised the inconvenience of animating a curve into existence. I did a few tests and found that it was extremely difficult to get the speed correct. It felt very mechanical.

5.3 Second Method

Instead of using geometric points, I designed the second tool that would use particle points. Particles are far more easily manipulated, as particles can have forces applied to it, can be given velocities, or a direction, can have individual lifespans and unique particle IDs. The disadvantage was that for any change to become apparent, you would have to rewind the sequence to the start of the animation time slider, and that is quite inconvenient when making small changes.

Initially I created a basic form of the tool to test its practical worth, this was simply a cone attached to a single bone, with two locators (see figure 5.3). The first locator would move the cone around; the second locator would set the direction that the cone looks at. A point on the coin would release a single particle every frame.

I found it to work particularly well, although the points once emitted felt as though they had been abandoned, whereas I wanted them to feel very much a part of the characters body.

To achieve this I gave each of the particles a velocity, which was exactly opposite to the direction the tool (see figure 5.4). Now as the object moves, it leaves a trail that reacts to the change in direction of the tool. This feature clarified the direction the character was pointing in, as well as making the trail appear to be an extension of the body (i.e. the emission point).

With these basic features, I began using the tool in development, with the intention to return and layer on features when needed.

As a final point, working with Houdini allows you to create a tool, use it/keyframe its attributes, and then see you return to update or upgrade the tool. This allows you to progress with work without having to worry about the tool being perfect.

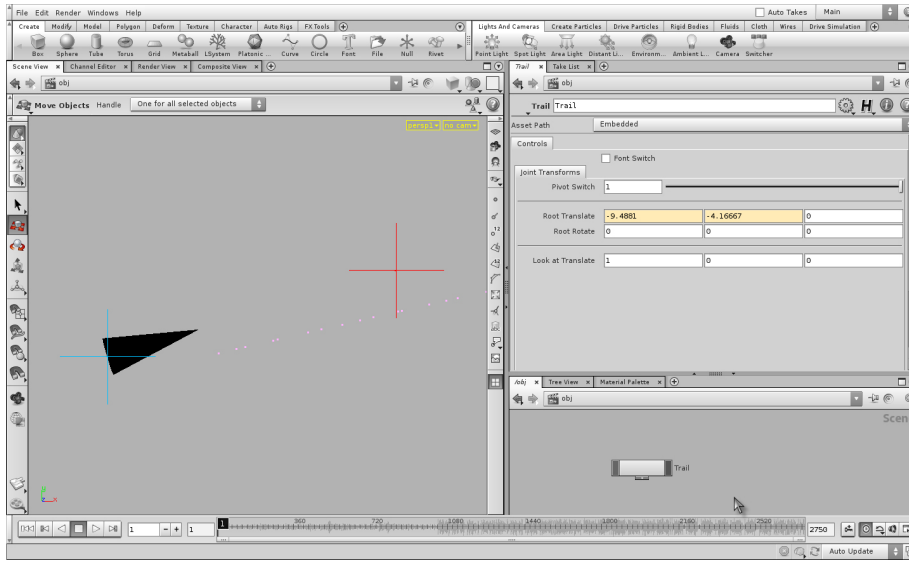


Figure 5.3: *Version 1 of the Final tool. It can emit particles, can have a root translate, and a lookat direction*

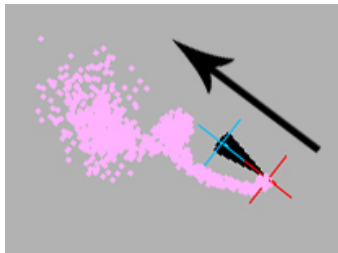


Figure 5.4: *Particles now move in the direction of the root handle, so it feels like the natural trail of the character*

Part II
Production

Chapter 6

Animation Methods

The development stage encompasses all the trial and error that led to the implementation of the tool in animation, and their combined end result.

Animating a single line is quite a challenge. You have no facial features, so you can't express happiness with a simple smile, or boredom with a frown. You don't have a body composed of a torso, head, limbs etc. So typical body gestures, such as curling up in fear or jumping in happiness, are not possible. There is no set 'correct' speed, or weight for the line.

To develop an animation method, and in turn the final result, I tried using a number of methods based on a variety of different source footage.

6.1 First Method

My first approach to the animation process was to film human actors interacting with each other based on the previously defined emotions. I wanted the motion to be as real as possible, and without the presence of my wife I knew it would be difficult. The next best thing was, of course, to get another couple who may interact similarly. It was important they were a couple, so that when they interacted more closely the motion was more realistic, as opposed to being awkward and clunky.

I asked them to perform the emotions, and gave them instructions on how to perform it. After an hour of filming, I had three minutes of perfect footage for the sequence, from which I began to use as a basis for my animation (see figure 6.1). I depended on the footage for timing, and pace, but it was soon evident that this method wasn't appropriate. The pace felt wrong, and even when I sped it up, it didn't feel like the character had a natural motion, as the pauses or the limping from left to right of a normal human being doesn't apply to a line character. I also found that while the actors conveyed the emotions very well, transferring their motion to the line character didn't. The human actors still used their bodies to convey the emotions they felt, for example the female actor curled up, and that demonstrated shyness.



Figure 6.1: *(photoshoped)Joao and Ellie embracing, while acting out the ‘Union’ section of the Animation*

6.2 Second Method

My second method was to take inspirations from others, then animate ‘artistically’ from my mind, by imagining the emotions and reactions of the characters. This method saw me running to Youtube, hoping to find line animation. At this stage of the project, I was feeling quite at loss regarding the possible methods to animate the characters.

There were quite a few ‘Line’ animations; the only problem was that they were very linear, with no speed or emotion. They were not characters; they were simply lines that were drawn into existence. I could not find, nor am I aware of, any line characters. Instead, I focussed on studying the animations series ‘La Linea’, which I mentioned earlier. The animation was the closest thing to my idea in concept, as their character was literally a part of one long stretching line. However, that was merely a connection, rather than the basic element.

Armed with a little more knowledge, I began animating from intuition, using principles I had learnt and practised during the course. Surprisingly enough, this technique was actually far more successful than the previous technique. I managed to get through 450 frames of animation, before I began to experience any problems.

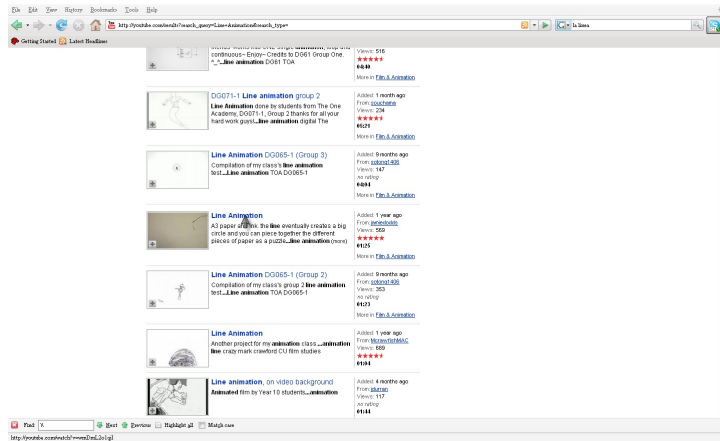


Figure 6.2: A screenshot of the Youtube results when searching for the keyword ‘Line Animation’

6.3 Tool Revisited

The ‘union’ shot required the characters to dance in circles together, much like a ballroom dance. My tool was not built with this functionality in mind, so I gave it an animatable pivot. While animating, I found it frustrating to have to constantly animate the characters moving in a sin pattern, as to me this seemed to be a reasonable ‘walk cycle’ pattern the characters should follow. So when I returned to the tool, I sought to create an automated way to animate the character performing this motion.

As the tool was basically particles emitting from a point, I placed a force on it, and allowed the user to access the amplitude and frequency parameters from the tool options. The force was set up so that it would automatically create a sin pattern. What is, in my opinion, more interesting about this is that the user can enter an expression in the previously mentioned tool parameters, and that would feed directly into the particle network. This could allow for some interesting patterns, although I personally have not found any need for that functionality in my particular animation.

When I was animating the characters shocked by the presence of one another, I thought it could do with something more dramatic. So I added in some more functionality in the particle network. Namely the orbit functionality, where a character that is in shock would have his trail circle around him, like a defence shield. I also fixed the colour functionality, so now all the letters were a slight variant of the base colour the user defines.

However, even with all the added functionality, I felt that the animation would not be as fluid and lively as I personally would like it to be. As a matter of fact, the added functionality only encouraged me to set out and find other possible animation techniques, and one idea sprung to mind, LED lights.

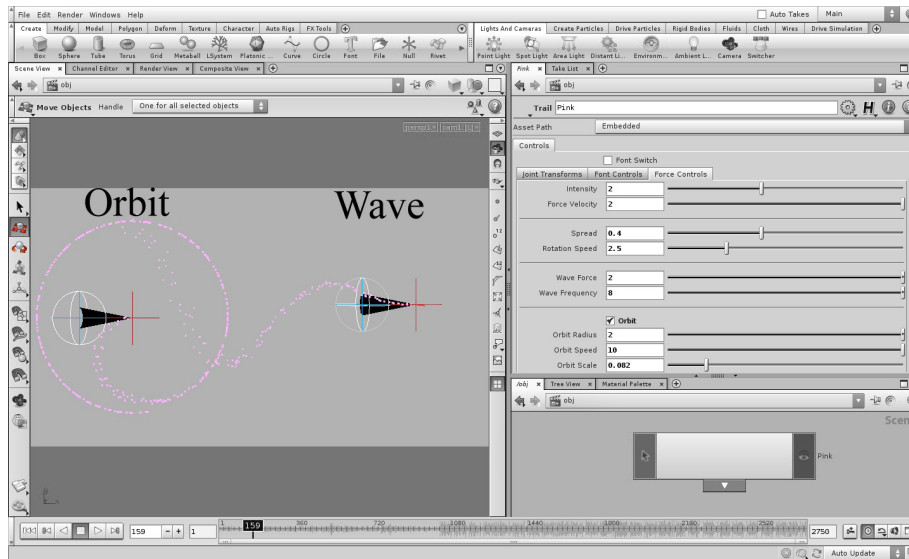


Figure 6.3: *The final tool with several new features. This image displays the new force options. There are more offscreen.*

6.4 Third Method

I had earlier seen a Youtube video of a dancer with an LED attached to her, being filmed in the dark (the footage was subsequently removed from Youtube). The led left a quick and faint trail, similar to what I was trying to achieve, so I had the idea of filming two LED's interacting with one another. I got a friend to act out my wife's role (as an LED), and I controlled the LED representing my character(see figure 6.4). I filmed in the dark so that a faint trail could appear, and for the characters to be better defined.

I had contemplated a number of techniques to use the resulting footage. One possible technique I experimented with was to try and track the movement of the light in a compositing package, save out the co-ordinates to a file, and then import them into Houdini using a custom script. However, I had neither the time, nor the expertise to create such a tool. I also contemplated rotoscoping, but from previous attempts with the earlier footage, I knew it would be both time consuming, and mechanical/jagged.



Figure 6.4: A screenshot from some footage I made when recording two LED's interacting as though they were my main characters

6.5 Final Method

While looking into tracking the footage, I found that Houdini actually had a tool that allows you to record your mouse movements over a pre-defined time range. I disregarded it at first, as animating with a mouse didn't seem to be too bright. But then it occurred to me that I could use a tablet instead, which would be great! However, I also had to have the characters reacting to one another, and you could only input one characters movement at a time.

When two people dance, whether its salsa, cha cha, tango, etc. the male usually leads the female. The female reacts to the male movements. Based on this thought, I began to think of my characters movements as a dance, and animated it as such. The male animated first, the female animated second, the male leading the female. Although, the original reason was technical, the final reason became an artistic one.

I decided to film myself animating the blue character (my tablet movement, see figure tablet) then simply play back the footage while recording my pink character reacting to the blue character (or rather, me reacting to the footage of me). It is easier than it sounds. In reality, I found that it was so tedious a process; I couldn't actually create any animation for the second character.

The next technique, which I later implemented in the final animation, worked incredibly well. I needed a method by which I can view the first characters



Figure 6.5: A picture of me while animating using a tablet. I would imagine that my pen was interacting with another character

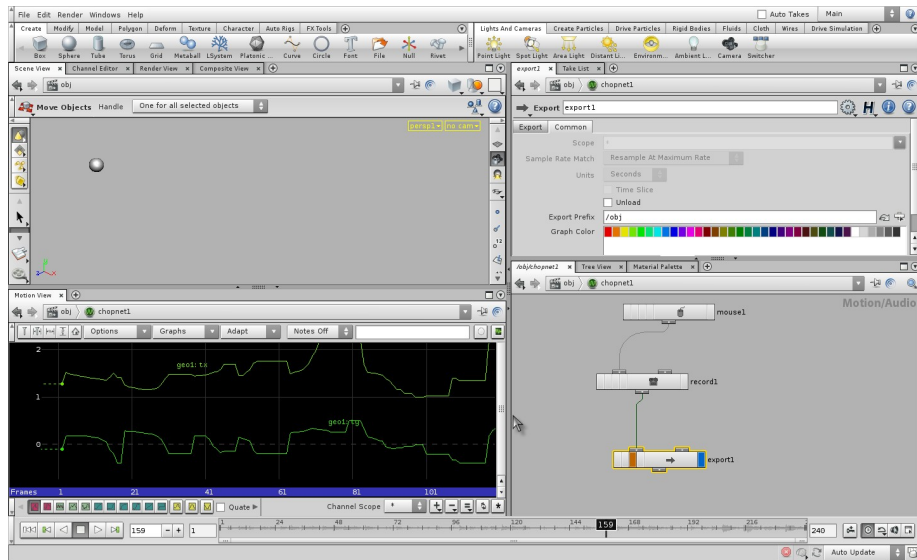


Figure 6.6: The simple Houdini Chop network needed to animate using a tablet. This was an early file where I tested the technique on a single sphere

movements on screen while animating the second character, so that it becomes something of a game. I need the reaction speed and realism that games usually offer. To do this, I recorded my first input for the blue character, by imagining there was a pink character on my tablet, and really putting myself in the mood of the main character. I would then create two spheres with a transform node, and input the blue characters animation curves into the first sphere transform. You can actually output the animation curves in real-time, so that as you move your mouse or tablet pen, the sphere moves. So I exported the animation curves of the pink character in real-time, and recorded my reaction to the blue characters movement, while really adapting to the pink characters emotions at the time.

I was extremely pleased with the results. For one, no keyframe animation could ever rival the liveliness and fluidity that this technique allowed. And you could never achieve such a personal interpretation with keyframing. It was a very personal animation as a result of the technique. Also, it was a very time efficient method, although I did have to practice many takes to get both characters looking as I wanted them to.

I had earlier mentioned the notion of the characters movement being a dance, and so thought that what would it be like to animate to music? Houdini allows you to place a music file into the time slider to play as you record your tablets motion. I quickly tested using a track with a distinctive beat. I found that it in fact not only worked very well, and gave the movement a context, but actually made it easier to animate. The speed of the music, I found, effectively defined the speed of the character, and its motion to a lesser extent.

I already had a track in mind to use for the final animation, so now the time for implementation came!

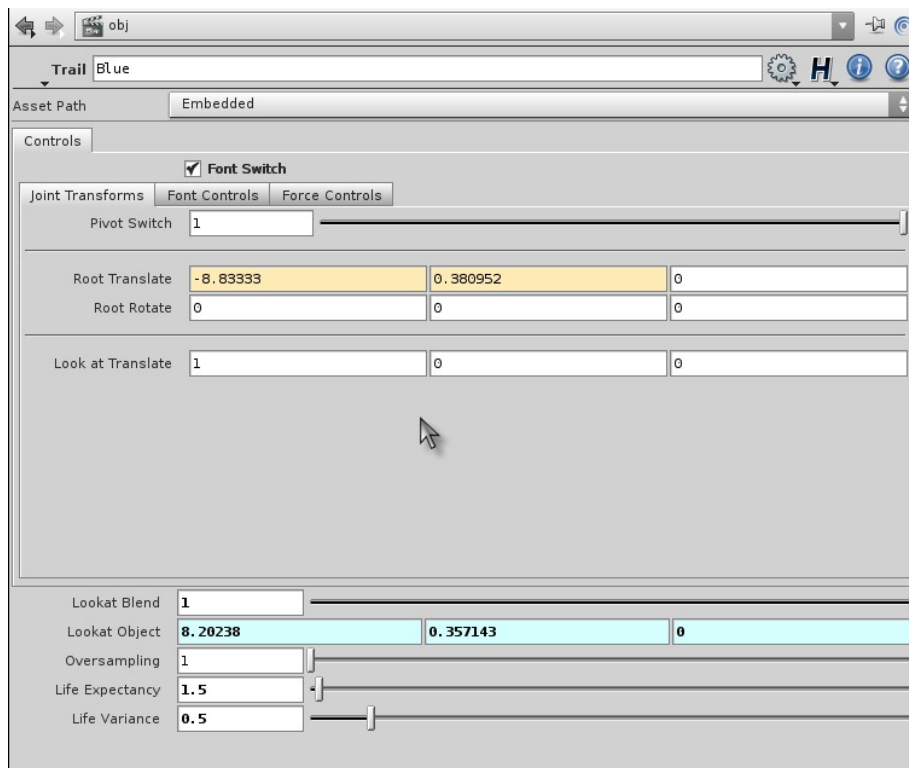


Figure 6.7: *The Joint transformation options of my tool. The main feature here is the animatable lookat that can blend between the transformations of another object, and its own user defined transformations*

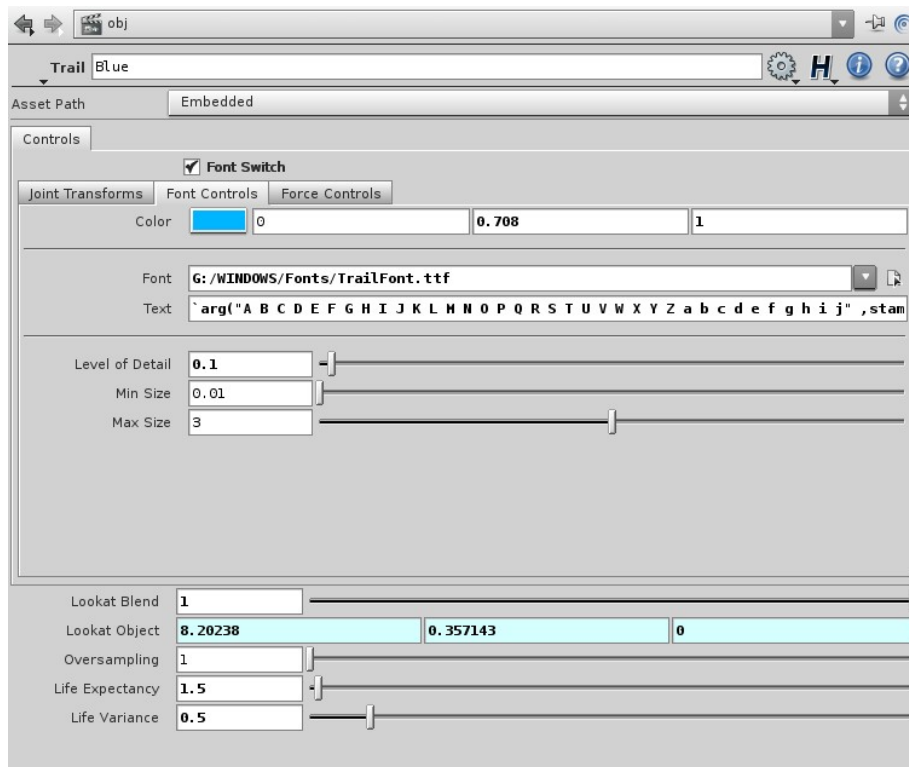


Figure 6.8: *The Font options of my tool. The base color can be chosen, as well as an animatable minimum and maximum size, level of detail (which was designed to be lowered for previews), Font type options, as well as which letters or symbols to be chosen*

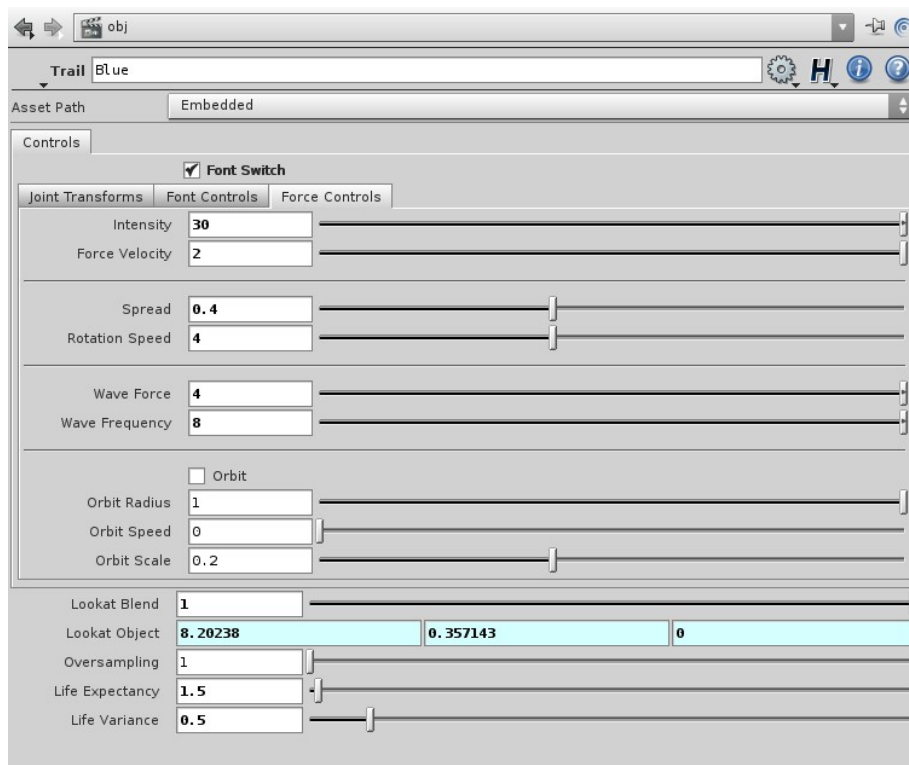


Figure 6.9: The Force options of my tool. The particles can have a sin pattern, or orbital pattern, of a different size, radius, lifespan, force, direction etc....

Chapter 7

Implementation

The implementation phase was simplest phase of the project. My tool was now well designed, and feature packed. And I had a track picked out that I wished to animate to (Ruby Sunrise - Arabic Lounge).

As mentioned previously, I set up Houdini for the animation. This involved placing the audio track into the time line, and creating two spheres with a transform node for each one. The, in CHOPS (channel editing section of Houdini) I created two separate networks to record the tablet motion for both the Blue and Pink characters. The node was comprised of a mouse motion detection node, a record node that saves the motion into cache memory, an output node that saves it to disk, a file in node that reads in the saved file, and an export node that transfers the animation curves to each of the spheres (depending on whether it is the Blue or Pink characters animation data).

Both spheres are transformed in real-time, as you record the animation. I started off by recording the blue character, and found the first take to be a bit bland. I repeated several times, incrementally saving each take, and then picking out the one I believed to be the best. I did the same for the pink character, except that I had to react to the blue character, and had to repeat the animation several times just to get it to align better. In the end, both characters moved in a very fluid, and life like manner, in my opinion.

I made each characters lookat parameter reference the other characters position, however, I had to keyframe the pink characters lookat, as in the beginning she is not meant to be aware of his presence.

I experienced some problems with the font, as Houdini does not recognise Arabic letters, or keyboard inputs. Instead I used a font creation package to map Arabic letters from the Andalus Arabic font, onto an English keyboard.

The final video is a simple composite of a single rendered pass, layered onto a almost entirely white background with a rotating swirl, enough to feel it slightly animated. I would have liked to render multiple passes with different color setting which I can then layer in a post production package, however one pas took 56 hours, and could not be split onto multiple computers due to fact that I had not implemented a particle cache option into the tool network.

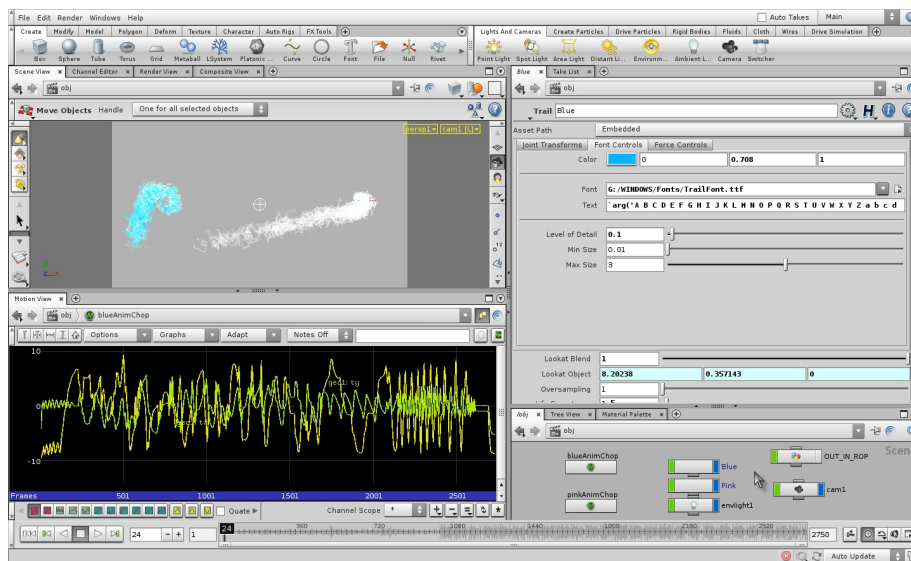


Figure 7.1: The final Houdini network used to achieve the final effect. The mouse animation data is on the bottom left of the screen. In the top right you can see what the final tool looks like on the font control tab

Part III
Analysis

Chapter 8

Analysis

8.1 Where the project succeeded

I had two main goals for this project

1. To create a tool that can allow myself and others to create a calligraphic line animation
2. To create an animation about my relationship with my wife, using this tool

I think that on many levels, I have succeeded in both. On the one hand I created a tool with quite a lot of functionality. As I tested the tool, I layered on more and more features to make it far more procedural and automated. And by the very end of the tool creation process, I had a tool that could effectively be animated without having to keyframe whatsoever, if the user pleases.

I am more pleased with how one failed experiment, led to another failed experiment, until it finally led to the most personal, artistic, time efficient method, that many people are probably unaware of, or have not found a use for it in real world production.

Further more, I am pleased with the fact I could tell my story to the music track of my choice. I had earlier thought that allowing the music to dictate the movement would make it impossible to express the emotions I would like it to. My animation turned out very fluid, and full of life. If it were keyframed it would have been impersonal and linear.

8.2 Where the project failed

8.2.1 The Animation

The animation, while fluid, was not as clear as I set it out to be. It is quite difficult to distinguish between the various emotions at times, and at others it could

have simply been made clearer by further practice. The most unclear sections of the animation in my opinion are the ‘Union’ and ‘Celebrate’ sections, where the characters are not in union as they should have been, and the playfulness is not as apparent as it should have been.

The background was quite static, and while I did create a very subtle animation, it is unapparent in the final video. The background could have done with a little less subtle animation, and something that compliments the characters, both artistically and story wise. I had originally intended for some sort of animated background. Something akin to a animated sketch of various events in me and my wife’s life together. However, I had to focus on the tool and main animation due to time constraints.

The letters come out quite thick, and appear to be more smoke like than they do calligraphic. Also, the fact that several passes were not rendered meant that there was little depth to the tool.

The animation-music synchronization was a bit off. That was more due to the fact that I had sampled the mouse movement at 24 frames per second, while pal is 25 frames per second. And hence, there was slight lag at the beginning and end.

The character trails should have been left to trail for a bit longer, as they died quite fast with the settings I had.

8.2.2 The Tool

The tool, while successful for my own project, had not reached the flexibility I had intended for. I originally set out to create a tool that could do more than just calligraphic lines. Functionality, such as having sprites instanced onto points, or having a simple line with a thickness, were never developed, partly due to the time constraints, and partly due to the fact that I only ever built functionality that my animation required.

I also created tool functions that I ultimately never used. The reason being was that I had experimented quite a bit during the design and production stage that very little time was left for the implementation and post production stages. In the end, I had a 2700 frame animation, and keyframing it was out of the question, so I avoided animating the particle functions significantly.

Another feature that never made it into the animation was the idea I had planned to use early on, whereby the letters are actually meaningful sentences that reflect the current emotion. The tool was set up so that you could easily keyframe words into existence, however time, and having not researched the idea thoroughly, meant that it could not be implemented.

However, it was not all time’s fault, as one functionality the tool was lacking in was the colour selection. For one, the tool colours did not lighten as they were displaced further away from the camera, as I had originally planned for. Another colour feature missing was to have every third or fourth letter takes on a random colour that complemented the base colour. I had however spent quite a significant amount of time trying to implement this feature, and realised that it would require a completely different approach, whereby you would use a ramp

to colour the letters, as opposed to an expression that derives the colour from a base colour.

8.3 Expanding the project

My idea is, in my opinion, the tip of the iceberg in terms of developing a unique Arabic art, based on our own cultural ideas and appeal.

Arabic art is seemingly at a stand-still from where I'm standing. This is partially due to, in my opinion, the schooling system, that does not respect art as an equivalent subject to the sciences, and to the culture, that is more concerned with reverting to what it used to be, and the glory it attaches with it, than to progress to something new and unique. I am more interested in taking it forward, and making it more respectful.

My tool is at an infancy stage. For one, it is only accessible to those who work with Houdini, professionals using Houdini are rare, and Arab Houdini professionals have their own UN endangered species list. For another, it is a very specific tool, you can only use it to animate a calligraphic line, and even then the letters are not attached to one another as Arabic letters usually are. That functionality does not even exist in Houdini, and an add-on would be quite difficult.

The tool itself could do with a number of features and upgrades. The most important of which would be to allow the user to decide what type of line he would like, sprites, instanced geometry etc... I would also implement a ramp colour option, so the user could decide the colour of the letters/sprite depending on their distance, and another ramp that decides the colour of every third or fourth letter.

In terms of the animation, there is a lot more I would have liked to do. For one, I would have liked to create a more dynamic environment, where the background was a canvas, and the characters stained the canvas as they moved along. I would also have liked to have a feeling for the depth of field, so that the more distant characters were fainter, and the nearer characters were more vivid. The characters bodies could be further developed, so that the head particles are more energetic, indicating the processing centre, while the body has a more controlled motion, much like limbs do.

The animation technique could also be furthered. Much like you can create a program that accepts two joystick inputs, it is intact possible to have two mouse inputs, however, a tool that could differentiate between the two inputs in Houdini would need to be developed. This could in the end allow the user to create a better animation, where each character is played by a human being who reacts to the character in real-time. It could possibly be expanded to allow for multiple characters.

8.4 What I learnt

There is no right or wrong way to animate a line, its just some will feel more human, and others more alien, and the more alien ones may feel more natural, in that they really are a line, while the human ones simply look like the trail a human leaves as he dances around.

You cannot create a tool for a form of animation you are not familiar with. How I expected to initially have the tool ready, then the animation is baffling to me at this stage.

I learnt a multitude of techniques to animate a simple particle emitting tool to create a line animation, and what the advantages and disadvantages of each of the techniques is.

I also learnt a completely new approach to animation, and that you key-framing is not the only way to give an object a life of its own.

8.5 What I would do differently

If I were to revisit the project, I would probably first sit down and listen to as many inspiring musical tracks as possible. Pick a few, and see where my thoughts go as I listen to them, and base my animation on that.

I found that animating to the music was one of the most rewarding techniques, in terms of having an interesting flow to the animation, and the fluidity necessary for characters such as mine.

I would focus more on the artistic side, as many of the tools were not used in the end. The time spent implementing these tools could have been better spent in post-production.

I would work on the cinematography, as a singly still camera can give the impression of stillness. Allowing the characters to move in the Z plane is possible, as Houdini can record pressure information from a tablet. I would definitely use that next time round.

Bibliography

- [1] Figure 1.1,Image by culpritz, <http://culpritz.deviantart.com/>
- [2] Figure 3.1,Pink Panther,The, Directed and co-written by Blake Edwards and Maurice Richlin, 1963, USA/UK: United Artists Corp., The Mirisch Company.
- [3] Figure 3.2,Life Force, Made by team Andromeda Software Development, 2007, Finland/Internet: Assembly Demo Party.
- [4] Figure 4.2,La Linea, Directed and written by Osvaldo Cavandoli, 1969, Italy: Belokapi.
- [5] Figure 4.3,Galaxy,Khaled Al Saai , 2001, Zurich/Syria: Kashya Hildebrand.
- [6] Figure 6.3,Youtube,Searching for "Line Animation",2008.
- [7] ZEROUNI, CRAIG: *Houdini On The Spot*,Focal Press, (2007).
- [8] CUNNINGHAM MICHAEL, WILLIAM: *The Magic of Houdini*,Course Technology, (2005).
- [9] THOMSON, GEORGE: *Digital Calligraphy*,Batsford, (2003).
- [10] HORSFIELD, MARC AND IVERSEN, JASON: <http://Odfoce.net/>,(2008).
- [11] SIDEFX: <http://Sidefx.com/>,(2008).
- [12] 3D BUZZ: <http://3dbuzz.com/>,(2008).
- [13] AL-SAAI: <http://www.kashyahildebrand.org/zurich/alsaai/>,(2008).