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# DuIK Bassel in Usage in After Effects and an Animated Short Film

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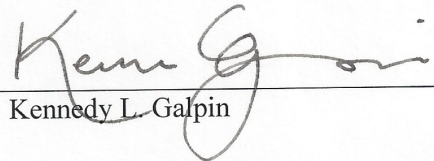
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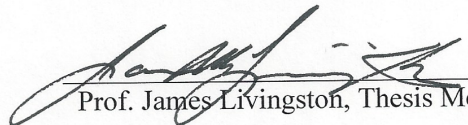
DuIK Bassel in Usage in After Effects and an Animated Short Film

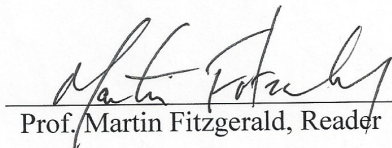
By


Kennedy Laine Galpin

An Undergraduate Thesis Submitted in Partial Fulfillment  
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Prof. Martin Fitzgerald, Reader Date

 5/1/19  
Dr. Scott Contreras-Koterbay, Reader Date

## **Introduction**

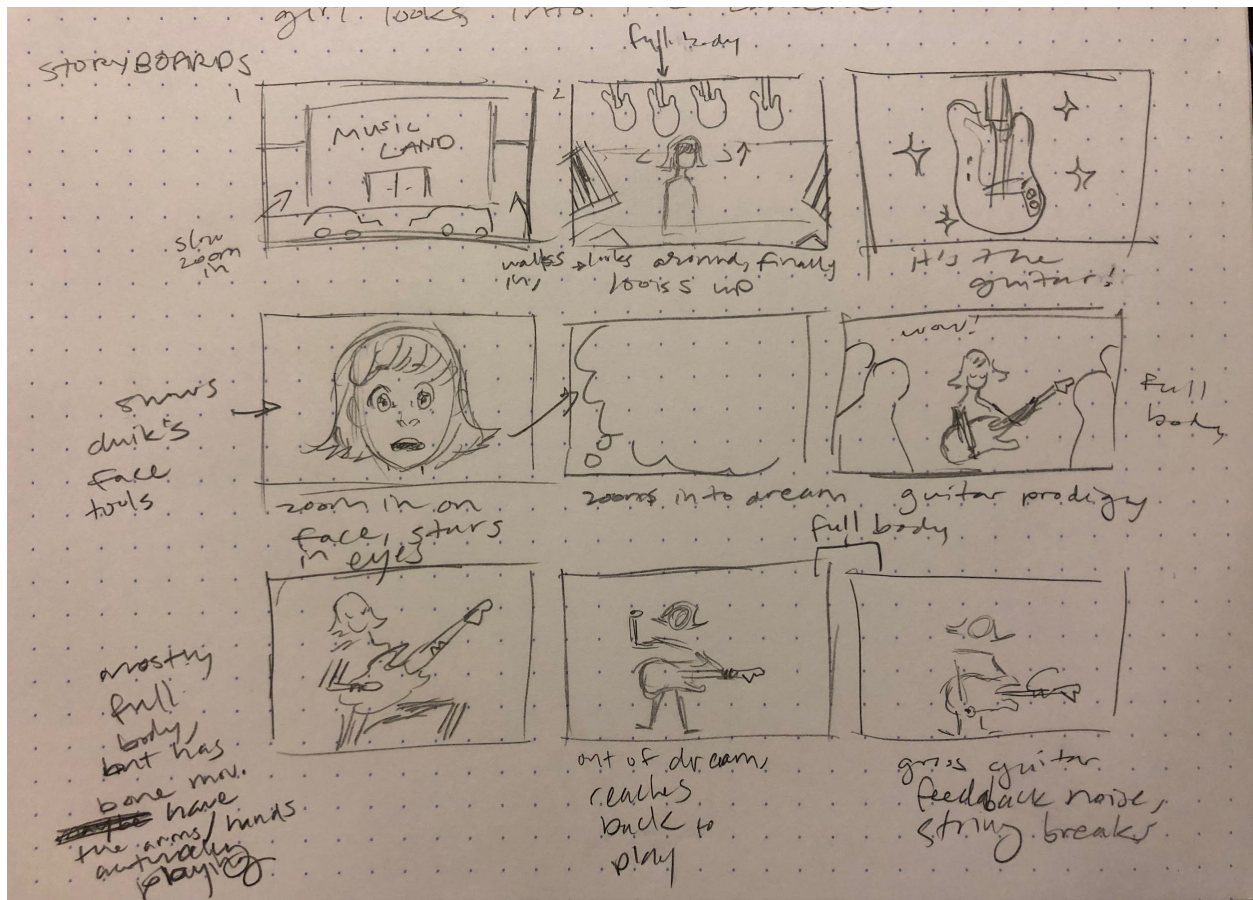
This thesis was made with the goal of creating a 2D short film in the end, with mainly using a program that is not normally used for character animation: Adobe After Effects. With the usage of an originally French plugin called DuIK Bassel (v16.0.9), I was able to create a model in Adobe Photoshop and then put it into After Effects. When the files were imported, the plugin would then assist in the rigging process, wherein I would be able to create the character's rig and make the 2D model within the program. This document discusses the entire creation of the short film that I progressed through, from the storyboarding, character creation, rigging process, and putting the elements together.

## Storyboarding

After I decided to do my thesis over DuIK Bassel, I knew that I could not simply just make the character rig and be done with the entire process. Instead, I decided that it would be best to create a short film to go alongside my workings around the program, as it would show how the rig could react to different situations and how I would have to work around the limitations of the plugin, or even After Effects itself. In doing so, I started out by trying to figure out a story that I could go with to try and make to show off the character rig.

Once I thought about it, I decided to do a story based on personal experience. I built the story around the feeling of a younger version of myself going to guitar stores with my dad as a kid and exploring, seeing all the guitars in the store. Much like the girl in the short, I fell in love with a specific guitar: a Fender Mustang. While the beginning of the short was myself harkening back to a younger self, once she sees the guitar, she dreams about what she could be. While initially I planned to have drawn out dream sequences and have it be a big ordeal, I settled on thought bubbles seeing her process, and in that way, I could stick to showing off the character rig more. Moving forward, the girl finally strums the guitar, and after a pause, the string breaks. It's played to be comedic, and it's a fear I knew I had when I first started playing guitar and even when I first picked one up. I didn't want to mess with something way more expensive than I could really understand as a kid. Shown below was my original storyboard, even

with the original design idea that I had for the character.



## Character Design

Since I was making a short all on my own, I knew I had to create the character by myself. While initially I thought about having a girl with shorter hair, I ended up doing a girl with braids after some playing around with it. This was also around the time that I did do some rudimentary tests with DuIK, and knowing the basics of what I could do with it, I knew with having braids, I could have them be on their own structure and animated on their own. I kept the design for them as simple as I could make them, but still have them visible as braids. So, the idea of having the sections of braids shaped as hearts came into play, as it allowed the bone structure of the braids to easily be placed and later moved as the character moved. Below are the initial sketches of the girl's face that I made, including different

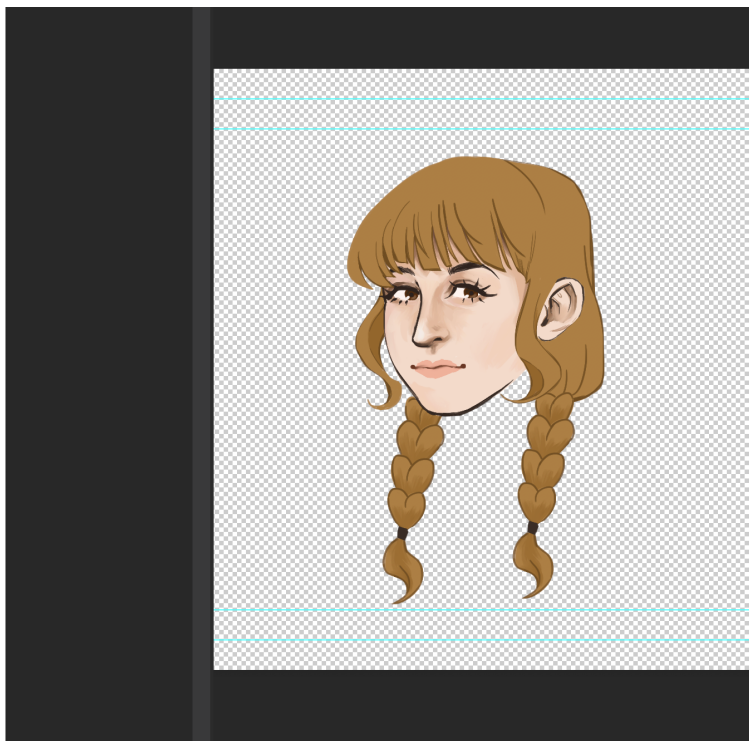
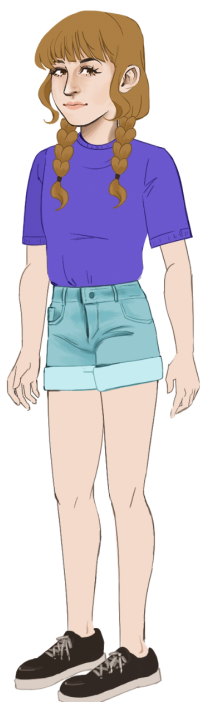
angles of her head. Notes for the character are also included, specifically about the braids.



Past the girl's design for the head, I also had to consider the rest of the design for the body, as it would be a full character model and rig. Once again, I decided to keep it rather simple, more so for simplicity's sake. I wouldn't need a complicated character for what I was trying to do, especially for the story I was trying to convey. Having someone that looked normal would be best for the situation. Once I settled on a design, it was time to finally draw the character in Photoshop. To make the character able to be rigged in After Effects, each section of the body had to be separated. For instance, the character's left arm had to be separated into three sections: the upper arm, the forearm, and the hand. These three sections of the arm would be able to create the rig later on for the character's left arm. The rest of the body was created with a similar process. However, the one part of the body that was different was the head.

For the head, every element of the character's face had to be separated. The eyeballs were separated from the rest of the eyes so they would have the ability to be moved later on. The eyebrows were not only separated from the face, but from each other, so they would also have the ability to be

moved. Other versions of the eyes and mouth were also drawn, so later on they could be rigged to move through expressions at will.

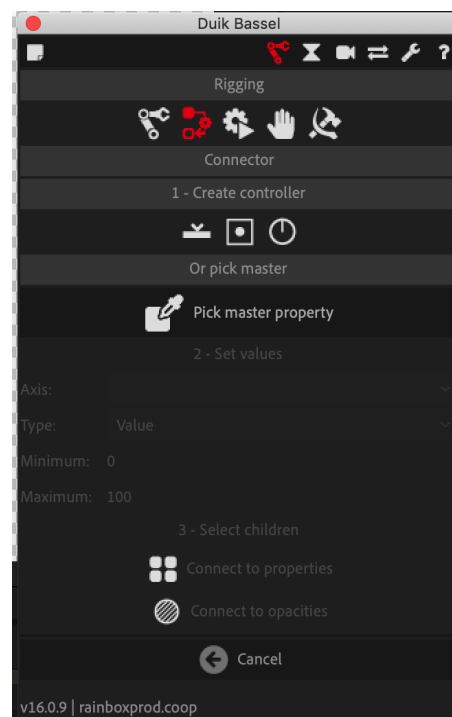


## Head Rig

Once the long process of drawing and designing the character, this is when the rigging and DuIK came into play. Since I knew that the head and face would be the most complicated part of the character, I decided to start off with them. Thanks to DuIK, rigging elements like the braids, eyes, and eyebrows were simple. For the braids, it was simply a matter of making a chained bone structure that the Photoshop files were parented to and then connected using DuIK's auto-rigging system. For the eyes, once the X and Y positions were separated, I was able to keyframe the eyes. To make the eyes move correctly, I had them going left and right for the X positions, and then up and down for the Y positions. After doing so, I went into DuIK's Links and Constraints menu, where I hit Connector. This allowed me to create a simple controller, and after selecting the properties that I wanted to link to which controller, I connected the properties.

In doing so, I created a controller that was able to move the eyes of the character, which a controller for each of the X and Y positions. I continued this process working through the different parts of the face, including the sideburns and eyebrows. Once all of these were done rigging, I had tougher things to go in and rig.

One of my main challenges with rigging throughout this entire thesis was definitely the controllers that allowed me to flip through the different expressions of the eyes and mouth. This was a process that I struggled with initially, as the DuIK documentation online didn't provide the instructions on how to do so, despite featuring a GIF of a project doing so on their site. So instead, I did some digging around, and it led me to Nicolas Dufresne's series of tutorials on Tuto. Thankfully, he had created the original GIF that I had seen, and was able to provide me the instructions on how how to flip through the expressions in the way that I wanted to do so. In this process, I had to create both the selections for the features that I wanted to change. In the case for



the eyes, I created a wide open eye shape, a normal eye shape, and a closed eye shape. I then

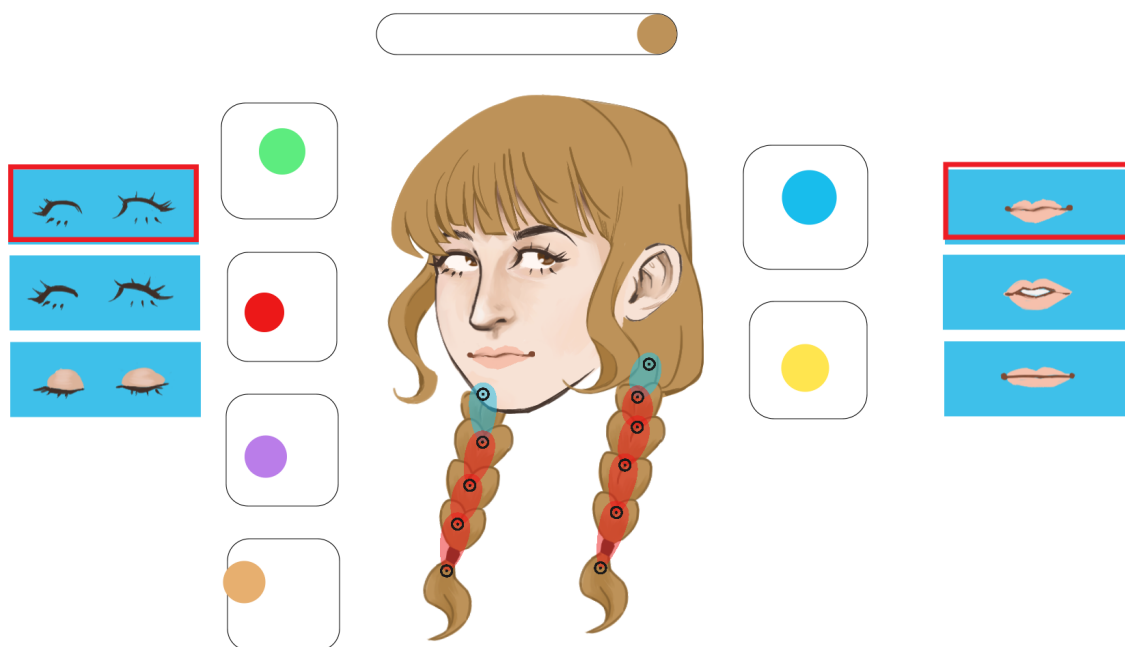


took these and put them on rectangles to create the selections. After creating the selections, I created a selector for these items. Once these items were put into After Effects, it was a matter of setting things up once again and keyframing things. All of the different eye shapes were precomposed into their own composition, and set into the same place, so the transition between the eyes would be seamless. After doing so, it was then a matter of keyframing once more, and then selecting all of the properties that would be connected to one another. Once things were selected, I went to the same Connectors menu, and instead of connecting the properties, I connected the opacities. It should be noted that everything inside of the precomposition also needed to be selected as well before doing so. Once the opacities were connected, I was able to switch through the different expressions of the eyes. This process continued on for the mouths as well, going through the same motions.

The final part of the head rig that I had to complete was the head turn. While it would be slight, it would help with the believability of the motion of the character. Nicolas Dufresne's Tuto tutorial series was used for this process, as it was a very informative teaching tool for me during the rigging process. Like before, the main face layer of the character was precomposed. To make the turn of the head believable, I used the Bezier Warp tool on the different areas of the face to create the feeling that the character's head was turning. After this process, I did the same



for the bangs, and the back of the head. Once all of those pieces were keyframed and moving as they should, I then went keyframed the positions of the rest of the face that would move along with the warped part of the face. After I selected all of the parts I either moved or warped, I was then able to connect the properties to a controller.



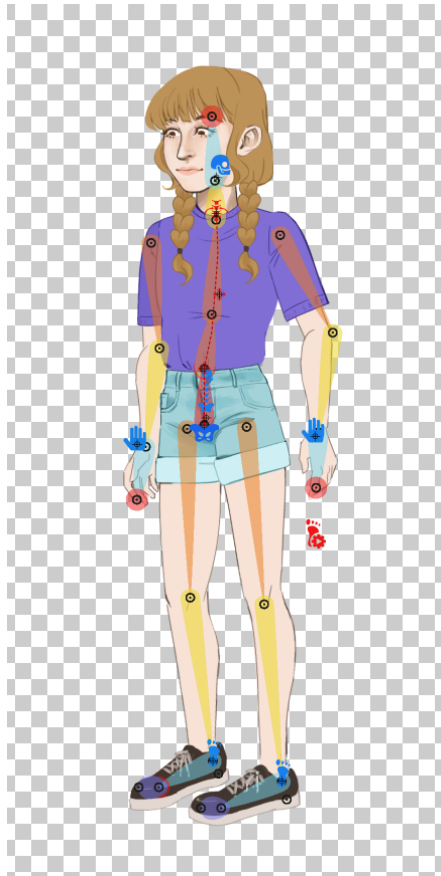
In the image above, each item that was to be moved had a corresponding color for its controller. For the purple and orange controllers, they were the rotation of each of the sideburns. The blue and yellow controllers were the X and Y positions for the eyes, respectively. Each of the eyebrows had their own controllers, with the left being attached to the green controller and the red attached to the right. The very top brown controller was for the entire head turn. With this system, I was able to move the head as I wanted to in the scenes.

## Body Rig

While the head rig proved to be a complicated task, the process of rigging the body did not. Instead of it being overly complicated, DuIK helps the process of rigging the body be rather simple. Once

I opened the Rigging tab inside of the menu for DuIK, I was able to go in and quickly hit the Humanoid tab. This created the basic bone structure for the character. Next, I overlaid the bone structure of the girl, making sure that all of the structures fit correctly.

After all the bones were overlaid like the image above, I parented all of the photoshop files to the

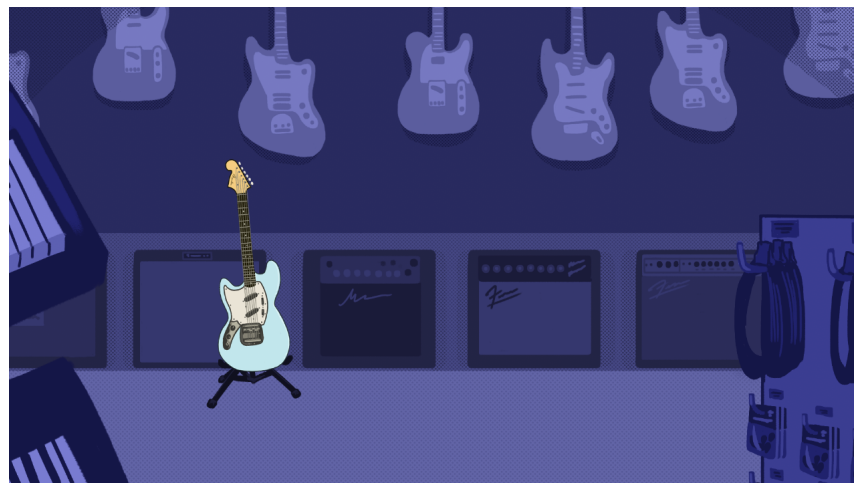
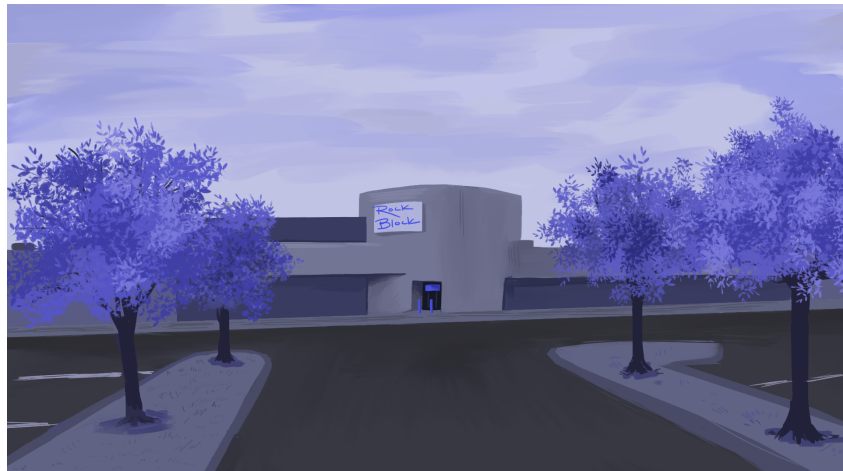


bone layers. Once I did so, DuIK was then able to use its Auto-rig and IK selection correctly. By using this, it created the hand, feet, head, and hip icons seen in the previously mentioned image. With this, the entire character was now rigged and was able to move freely and however I needed it to.

## The Scene

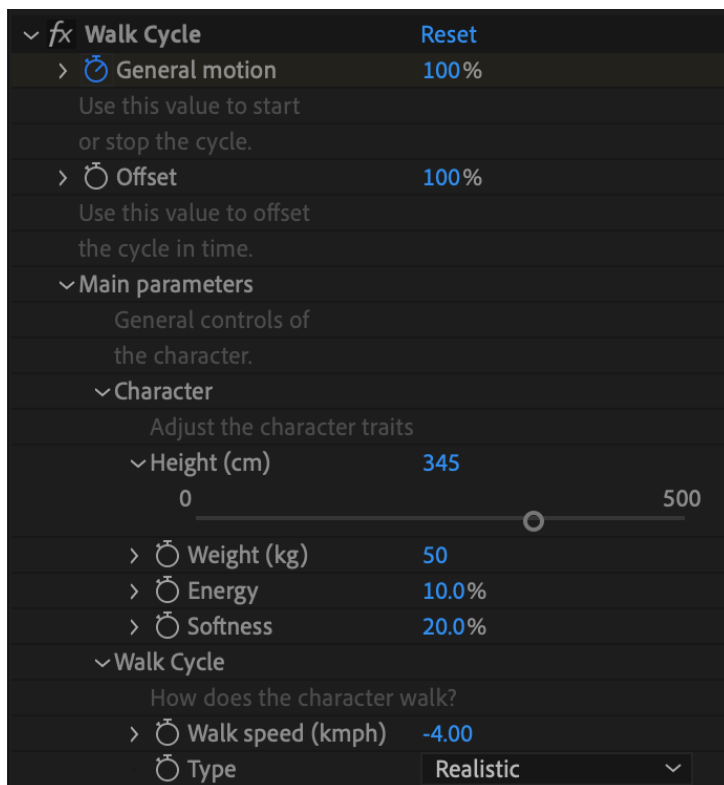
The next challenge I faced for this project was creating the backgrounds for the short. Since I was taking advantage of After Effects, I knew I was going to use the 3D and camera functions that the

program had. In doing so, I created elements with the idea that they could be brought in and have varying degrees of focus depending on the shot. To go with the idea of having it be based on a girl trying a guitar, having it set in a music store would be best. So I set out to create the background, keeping in mind how stores like Guitar Center, Sam Ash, or even Best Buy's musical instrument section that they tested in Nashville. This last one was a formative one for me as a kid, as my dad and I would visit it almost weekly. While I kept that in mind, I also added more design elements from other stores as well. In the end, I came out with two different backgrounds: one for the outside of the store, and then one for the inside. Each would have their own cameras and movements within After Effects.



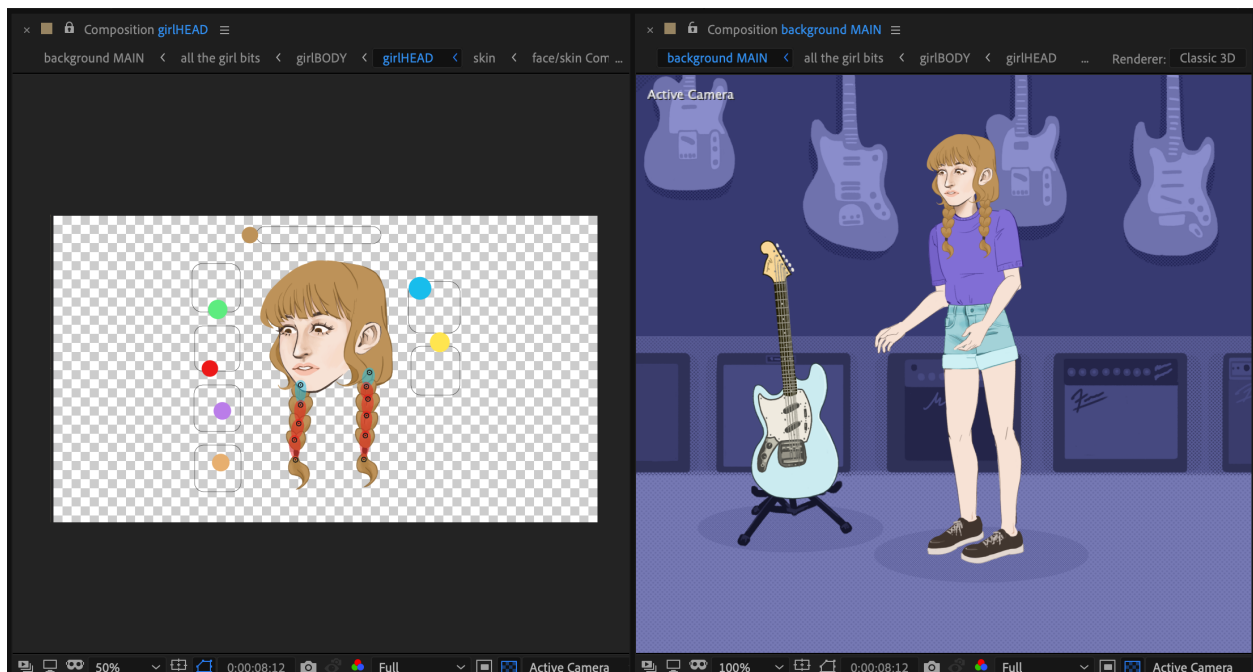
## Animating the Character

Getting started with the actual animation of the short, it was time to get really familiar with DuIK and how it works for humanoid characters. One of the added benefits of having DuIK rigged for your character is having automated motions. While there are a variety of different automations to choose from, the one I used for this project was DuIK's walk cycle. When the automation is first put onto the character, it's not exactly the most natural looking thing, and honestly, it looks rather janky. So to fix that, I went in and changed the height of the character in the walk cycle's settings to 345. This made the strides of the character more natural feeling and flowing, rather than quick and choppy as they appeared before. Adjusting the weight of the character also helps, as a higher weight slows the character's gait down. The walk speed, although tempting to mess with, only adjusts how long the strides were. I left the kmph for this setting still at -4, as the length of the strides already felt nice as they were. Below is the settings panel I had to mess with to get the right walk cycle that I needed for this project.



One issue with adding the walk cycle to the character however, is that when it's time to have the character stop so you can move the IK handles once more, you're not able to do so until the general motion of the walk cycle is at 0%. On top of that, you have to go into the IK handles' settings themselves and turn on the IK once more. Past that however, it's a great feature, even if you do have to tinker with it some to get what you need out of it.

Moving forward, once the IK handles were all turned on, animating the character was a breeze. To make the actual movements happen, you keyframe the positions on the IK handles itself. To get the hands to move as they should, you work with the rotation of the IK handles for the hands. Similarly, to move the head around, you rotate the IK for it. Shoulders, hips, and the spine can both be positioned and rotated to get the right degree of motion that you want for the character. However, to do any of the animation, whether it be for the face or the body, I had to have separate panels open with either the face or body on one side, and then the scene I was working with on the other. This made the work doable and much faster than flipping through different panels and hoping it looked good. Seeing it immediately on the other was pretty much necessary to animate this entire project to completion.



## Conclusion

When choosing to animate a character in 2D, there are a lot of options. With programs like Toon Boom, Flash, or even TVPaint, one can see why After Effects isn't normally considered to be used for character animation. However, in my findings, I found DuIK Bassel's plugin to be incredibly useful, especially when paired with the other capabilities After Effects already has in-program. Though not as robust as some other programs that specialize in this, with DuIK After Effects really does become a strong contender with the sheer amount of stuff DuIK can do. As someone who absolutely loves After Effects, having a plugin that is capable of fully animating a character is amazing, especially since it can bring my drawings to life now. Honestly, I'm very happy with the quality that the plugin provides and how it improves After Effects and what it does best.

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