

How-To

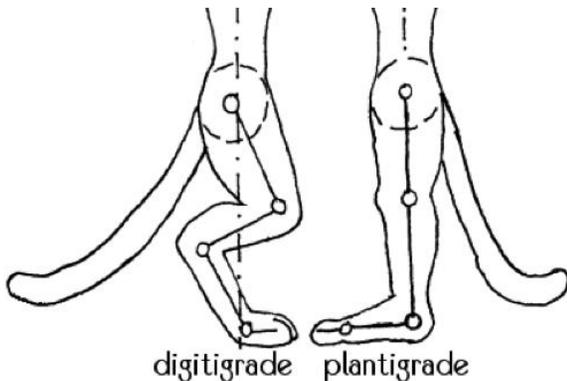


Making Stilt Creature Legs Courtney Rayle

Creatures don't always walk on normal legs and feet. Here are detailed instructions for creating an unusual pair of stilt legs that will give your costume an exotic look and gait.

I have always been interested in costuming that differs from normal clothing and alters the basic human form (or perception thereof). Things like wings, clawed hands, antlers, etc. fascinate me. Fursuits in particular are amazing, since most take the human form and turn it into something else.

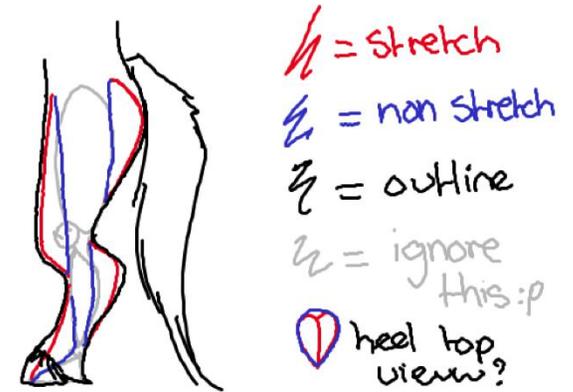
The best fursuits will usually go beyond a simple fur jumpsuit and use padding to alter the form of the person



Digitigrade vs. plantigrade legs. Picture from [Wikifur](#).

wearing it. One of the more common modifications is to use padding to make the legs of the wearer appear *digitigraded* (spelled sometimes as digigraded, depending on the source). Digitigraded legs do not bend forward, as plantigraded (human) legs do, but backwards so the animal is walking on its digits only (as cats and dogs do).

I wanted to attempt to make a digitigraded leg, but without using just padding. For animals like birds and insects, the leg is more delicately tapered in proportion to the body of the animal. I wanted to experiment with how to make a bird's leg appear as much like a bird as possible. While padding might work, it would make the leg appear too bulky, and I was hoping to imitate a crane or stork leg as closely as possible, since my ultimate goal was to make digitigrade legs for a mythical bird costume.



How to pad the human form for a digitigraded appearance. Picture from: fursuit.livejournal.com.

In researching ways to make digitigrade legs, I came across a tutorial by [Gryphern](#), an excellent costumer who has many good video tutorials on her Youtube account. Unlike some tutorials/designs I'd seen, hers was easy to attempt, had clear instructions, would not cost much, and would allow me to discover what worked and what didn't work without wasting too much time. Her design wouldn't give me the sleek look I wanted, but it was a good starting point. I also wanted to see how difficult it was to walk in stilts that altered the angle of the wearer's feet, since I'd found other digitigrade stilt designs, but many of them had warnings that the designs were for professional stilt-walkers (which I am not).

Ray Harryhausen's Cyclops from *7th Voyage of Sinbad*, is a spectacular example of a creature with digitigrade legs.

While the videos on her Youtube account show enough that some people would be able to copy the design from that alone, Gryphern was nice enough to put her digitigrade stilt instructions into book format, which can either be purchased in print form or downloaded for free. It can be found [here](#) (scroll down to underneath "More from Gryphern" for the free downloadable version).

Before I began construction on the legs, I used YouTube to find other examples of digitigraded stilts, as well as people who had used Gryphern's design so I could see other viewpoints and see if anyone had design improvements. This was a few years ago, and there was not much available aside from how to achieve the digitigraded look via padding, but I did find one video that was extremely helpful (it has been erased since, so I cannot provide a link). The person in the video mentioned taking inspiration from the movie "Underworld Evolution" and how their stilts were made (which I did not know about) and suggested a few minor changes, one of which I did incorporate into the design.

I will refer to the above picture (from Gryphern's book) to illustrate where I deviated from her design. I will note that this picture is misleading, and the wearer of these stilts would be constantly struggling to

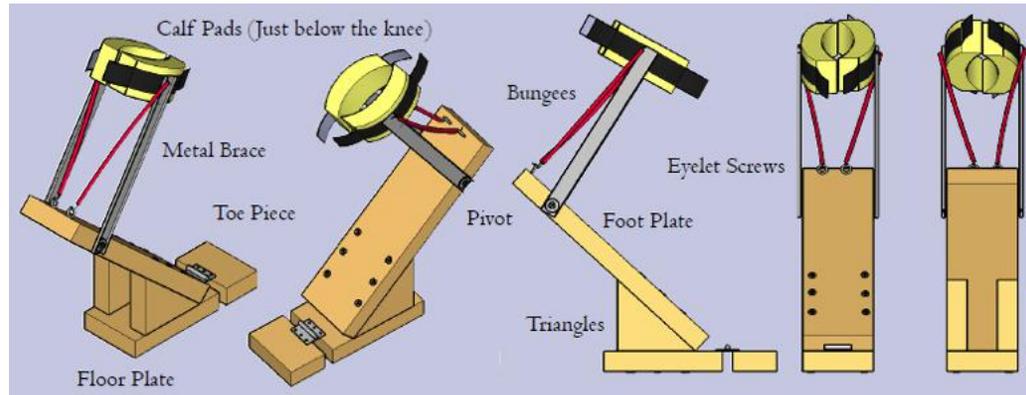


Image from Gryphern's [book](#) on construction of digigrade stilt.

stand up. The floor plate needs to extend far back enough to catch the wearer's weight (usually back far enough that a straight line can be drawn between the back of the floor plate and the wearer's arch/start of the heel). Be careful, though, because too far back and the stilts become impossible to walk in. My advice is to buy extra wood (for mistakes) and experiment by slowing cutting off more and more from the back of the floor plate until the stilts feel right.

To begin with, I used 2x4 wood everywhere in the design because I had some lying around. **DO NOT DO THIS!** While that wood works well for the foot plate and the triangular pieces that brace it, a thinner piece is needed for the floor plate. I fell over very quickly and multiple times before I realized what needed changing. Also, the picture is misleading in that maximum stability was obtained by making the floor plate a bit wider. It needs to extend about half an inch from either side where the triangles are attached.

Once I made these two corrections, on the preliminary stilts, I was able to walk up my garage steps and into my living room, crossing tile and carpet, with minimal effort.

Instead of using metal tracks, I went to the hardware store and found aluminum flat, narrow pieces, which seemed lightweight enough to work and were stable enough when cut

shorter to provide support. The corresponding steel was considerably heavier, which was why I avoided it (I knew the rest of the costume would be heavy, so I was trying to cut weight out wherever possible).

The major difference between Gryphern's design and my stilts is at the pivot point. Hers has the metal brace pivoting on the foot plate. I wanted my point of pivot to be at the ankle, so as to reduce stress on my legs (my knees are a bit weak), which was the suggestion made by the other video. To do so, I used T-shaped steel brackets at the hardware store, bolted those to the foot plate, and then attached the metal braces to the brackets in a moving pivot point.

For the brace part that is just below the knee (where the stilt straps to the leg), I used some PVC pipe cut in half. This was suggested in numerous videos, and it worked fairly well. In Gryphern's tutorial, someone stated they added a small brace just

beneath the toe of the shoe, which I also did, and this was immensely helpful.

For a quick rundown of this first working stilt, watch this [YouTube video](#).

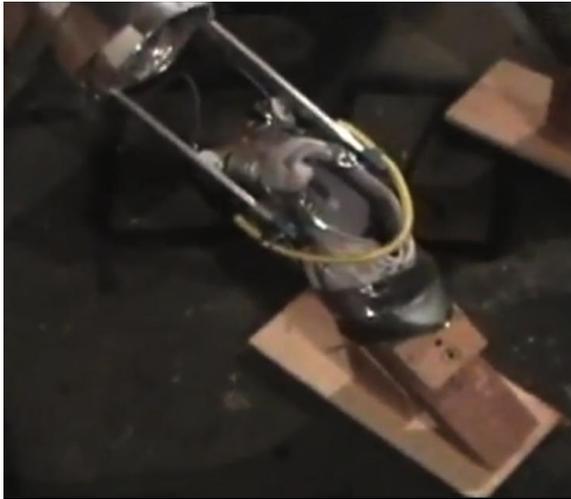


Image from YouTube video of first working stilt.

When I covered them, I carved toes out of foam, but without wooden supports underneath and discovered they had a tendency to fold underneath if I dragged my feet (which happens when you wear the stilts). I then tried to paint the whole thing in colored latex, which did not work. The stilts became very heavy and the paint allowed everything underneath to show through.

So I had to rip off the foam and start over. I modified the base again to allow for the look I ultimately wanted, and made the shoes fit a bit better (cutting them in some places and duct taping others). This improved stilt design was the one I used for the stilts that everyone saw at Costume-Con 30.

The stilts without all the covering can be seen in this [YouTube video](#).



Image from YouTube video shows walking in stilts.

The following steps were just to imitate a bird as much as possible. I first covered the stilts with some spare fabric so that the final covering would have something to stick to (below).



I then used paper to get approximate shapes. The stilts could still move forward and backwards without the paper ripping or falling off. The paper became my pattern for cutting out the yellow vinyl I covered the stilts with (below).





considering going far outside my comfort zone and using stilts based on the [WETA leg design](#), developed by [Kim Graham](#) and Weta technicians. This type of stilt is incredibly close to what I want the legs to look like, but also more difficult to walk in and work a costume around. A company called Area 51 makes them, but my wallet is not large enough to buy a pair at present. I found instructions for building a set from scratch, so they will show up in the future

Due to time constraints, I used hot glue to attach the vinyl, which I don't recommend as it doesn't hold as well as I wanted it to (above).

Overall, I was pleased with the results, and I learned a great deal about walking in stilts and the difficulties in incorporating them into a costume. The Peacock Priestess costume everyone saw at CC30 was not the intended costume for the stilts, but I wanted to show them off. Due to the vinyl and hot glue, the stilts did not survive the trip home, but I managed to save the underlying frame and will incorporate that into a costume (maybe one with hooves).

I am still planning on doing the mythological bird costume in the future. After having done this type of stilt, I am

in one of my costumes.

For those interested in the stilts made by Area 51 (or if you want to see what WETA legs in action are like), their website is here (I recommend watching the video on their [home page](#), as the Alien costumes in it are quite spectacular).

Courtney Rayle has been making costumes for over a decade, but only discovered her fellow costumers recently, much to her delight. When not imagining odd new costumes to attempt making, she tutors sciences and math at the local community college, and focuses on completing her Masters in Chemical Research.

