

How-To



Making Digitigrade Legs Using the Pillow Method Courtney Rayle

A costumer reports on her experiments with a technique that uses pillows to create digitigrade legs for her fursuit.

I am in the middle of creating a pair of digitigrade legs for a Ren Faire in June, so let me share some of my experience so far, just in case anyone out there wants to make a pair of these as well.

There are many methods for building digitigraded legs, and many great tutorials available online (two of the instructions I extensively studied before attempting my pair of legs were by expert fursuit builders Matrices and Komickrazi). I encourage anyone interested the search the internet, as well as look on the [Fursuit Livejournal](#) community (who are an awesome group of individuals ready to offer advice for any variety of fursuit topics).

How did I ultimately go about constructing my fursuit? Here's the process.

1) Look at as many examples as you can. As with any costume, the more reference material you have, the better you

will know what you want. Examine the legs of animals that you wish to mimic (horse, deer, dog, cat, etc.). Look at examples of other costumers who have made that animal or a pair of digitigrade legs that you like. If



Courtney Rayle at Costume-Con 31. Photo courtesy of Don Searle, [Fantascenes](#).

possible, try to find some “work in progress” pictures so you can see what is really going on, and not get discouraged when you are working on it and it doesn't seem to look right. If necessary, email people about how they constructed their legs/fursuits. Some makers have spent years perfecting their art and developing their own trade secrets, so if they don't want to share, don't push.

There are some great examples and tips on the Fursuit Livejournal and [Furaffinity](#). In particular, I found the [Fursuit Leg Padding Diagrams](#) by Blazetbw to be helpful for narrowing down what animal to use as my starting point. The [Digitigrade leg studies](#) by kira animerawr were also insightful when I started to plan where to add padding.

2) Decide on how digitigraded you want the legs to be. In other words, do you want the animal to look realistic, cartoony, or something else? There are many examples out there, ranging the gamut from barely any padding (mostly human-looking) to extreme padding (the entire leg is nearly covered with additional bulk). The more padding you add, the more difficult and hot the costume will be, so plan accordingly. Try getting pics of yourself, or the person for whom you are building, and draw padding on top of those. Remember, less tends to be better than more, so try to achieve the shape you want with the fewest modifications.



Examples of digitigrade legs from [BeetleCat Originals](http://BeetleCatOriginals.com)

You can branch and try different methods. What I did was to keep the padding layer separate from the fur layer. This is because I wanted the “muscle” and “skin” to move more naturally. This method means the next step is:

3) Make a stretchy pair of underpants, or at least a comfortable pair of pants that will move with you, nothing super tight or baggy! While you can certainly just pin padding to yourself or sew it onto the fur when you get to that step, skin tends to glide over muscle. This makes the effect of not gluing/sewing the fur to the padding more realistic. But you still need something to attach the padding to. Old stretch pants or something similar will be a good base. I recommend adding a non-stretching belt to the top of the pants, so they stay on when

you wear them. Sometimes elastic just doesn't spring back and grip as much as we'd like.

4) Wear the pants and use paper to simulate the places where you will be adding padding. This is as simple as just taping some cut out paper shapes to the pants like fold out flaps. This gives you a starting point for when you add the padding.



Super toony but highly technical Lewis the Hare sports dropped crotch. Photo by fursuit maker Arito.

Try and avoid putting too much emphasis in any one place. For example, I was very careful to try and keep the width of the legs from a side view more or less the same until mid-thigh. Many digitigrade legs

add too much to the heel part (behind the knee), or don't have any padding above the foot. This is why this visualization step is important. It can help you catch any mistakes before you start really cutting and sewing and investing tons of time into the project.

Below is an example (a WIP shot) of Irdkazul's kangaroo fursuit. This shows extensive padding, and huge feet as well. You can see the flaps taped to the person to give an idea of what size padding will be employed.



Taped on flaps give an idea of padding size. Photo from Irdkazul's Livejournal entry.

5) Now its time to make the padding. There are two methods that can be used. 1-inch foam can be glued and carved to make the padding pieces, or little pillows can be stuffed and then sewn onto the pants. I chose to do the later mostly because I had some stuffing and have never been able to carve matching sets of things out of foam.

The best way I've found to make my pillows for stuffing was to take the flaps from the previous step and use them as a pattern. I cut out fabric slightly bigger than each flap by adding $\frac{3}{4}$ inch seam allowance, and then make a base (the part that would be lying flat against my leg). This meant there were three pieces to be sewn together for each pillow.

A word of advice: I used some cheap fabric I had lying around that was given to me by my neighbor, who got it from a friend who didn't want it any longer. This was a mistake as the fabric frayed terribly, and I had to adjust the pillows after I finished each one because they turned out slightly bigger in some areas than I wanted. I highly suggest using a lightweight fabric (cotton or muslin) that will not fray if you have to snip off pieces of the pillows and re-sew them to make them the right size.

6) After making the pillows, it's time to add the pillows on. Baste stitch first, so you can make sure everything is in the correct place and even on both sides. If you used foam carvings instead of filled pillows, you may want to make slip covers for the foam so you can sew it onto the legs easier.



Author's legs with just the padding.

**Special step:* In all the tutorials I read about building padded fursuits/digitigrade legs, there was always a word of warning about trying to make the padding too extreme, as that might cause discomfort. I found that one of the best ways to make sure this doesn't happen is to test whatever costume I'm making multiple times while I'm making it.

After sewing the pillows on, I tried on the legs and found the pillows on the back of my calves to be very uncomfortable and chafing me when I walked. I fixed this by editing down the heel part of the padding (behind the knee) and boosting the front padding (on my shins) just a little. I also walked around for a long time to make sure

the padding looked right (had my brother help me by watching how it moved). From his feedback I edited down the side/hip padding considerably. So, try it on often, and be prepared to make alterations. Getting the right shape and feel is very difficult.

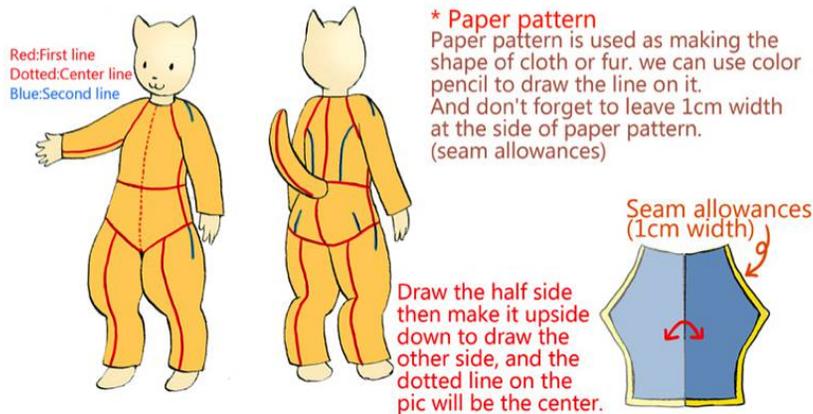
7) Once the padding is on and even (left), stitch it down a few times. I went around the borders twice on mine, since digitigrades legs tend to get used harshly when they are worn.

8) Next, it is time to make a pattern for the fur to go on top. There are many ways to do this, but I like the duct tape method best. Take strips of duct tape and put them on the legs until one side is completely covered. Since the legs are symmetrical, the pattern can be doubled to give you the whole legs. Go all the way up to the waistband and make sure everywhere is covered by at least two layers. If, like mine, you want to be able to slide the legs off and on when dressing using no clasps, make sure the tape on the waistband is loose enough to do so.

If possible with the tape on, move around and make sure your movement is uninhibited. It is easy to stand and think you have a good tape pattern, but suddenly realize you cannot move well in it. I used a duct tape dummy to help me fit my legs, so I did not have the option of trying them on to test my movement.

9) Draw the different colors you want present on the legs with a Sharpie. It can be anything, as long as you label where everything goes. Add markings so you can

Basically you can refer to this picture, and make the paper pattern.



Tutorial by [TashiroYu](#) show how to make major seams run down the fronts and backs of the legs.

match these pattern pieces when they are cut out. Also, try to make sure the major seams are running down the front and backs of the legs, as shown in a tutorial by TashiroYu (above). It makes everything easier.

10) Carefully cut out the pieces without cutting your pants or padding! Add darts as needed to get the pieces to lay flat. Don't worry if they aren't perfectly flat. Fur hides little mistakes very well.

11) Make a mock-up out of cheap fabric to make sure the pattern works. Fur is expensive, and you don't want to waste either materials or money. Don't forget to add a seam allowance when you cut!

Gently put the mock up on over the padded pants and wear them around for about 15 minutes, to make sure there are no places where the mock up is stressed. Crouch down, sit on the floor, stand up, jump, goose-step, whatever you can do to

stress that mock up. Likewise, make sure there are no extremely baggy areas that don't need to be baggy and can be taken in. The crotch/butt/knees are high movement areas, so expect there to be some loose parts of the costume near these areas. If the mock up at any time rips because an area does not have enough give for the range of motion you will be using while wearing the costume, make a new mock up accounting for the rips and start over.

Because I used a duct tape dummy to model my pants, there was not nearly enough room in the lower butt and knee areas. My mock up ripped widely in both places, and I went back to the pattern and added more material. The second mock up I made was far too loose. I added too much room to those areas, so I used safety pins to get the mock up to fit as perfectly as it could.

12) Sew the fur layer. When pinning the fur, make sure as much of it as possible is brushed out of the seams. You should see none while sewing it. Try to use the smallest seam allowance possible, or trim your seams, so they show as little as possible when you turn the fur right side out.

Use the sewing machine for large pieces. For small pieces, such as decorative spots or shapes, just cut them out with no seam allowance and hand sew them in. For example, on my flanks are stars and geek symbols that I just cut out of fur and sewed by hand (below).

13) Pull the fur layer over the padded pants. You can either leave these layers separate, or attach them at a few key points so it becomes one article of clothing. If there are any baggy areas, you can use elastic thread in a crosshatch pattern on the wrong side of the fur to make "stretchy fur" that will look nicer. Eewolf has a tutorial for making stretch fur on the Fursuit Live Journal. Two pictures on the next page show his backside without the stretch thread and with the stretch thread added in.



Flanks are stars and geek symbols that I just cut out of the fur and sewed by hand.



Backside without the stretch thread and with the stretch thread added in. Photo from Eewolf's tutorial on the Fursuit Live Journal.

14) Brush out the seams so the fur looks more natural. For this, it is best to use a pet comb and to go very slow and gently. Remember, this is fake fur, and it won't grow back, so you don't want to overdo it.

15) Tails are optional, and easily added. Making one that can be attached via a belt or just pinned on is easy. Add shoes/paws/hooves/foot coverings (plenty of tutorials on how to make those available online) and you're done! You have a lovely pair of digitigrade legs!

Below at left is the fur layer atop the padded leg layer for my digitigrade legs.

I still need to properly trim the seams, brush the seams, and sew in the elastic thread in places (that butt is seriously sagging) to finish these legs off, but they look good so far. Perfect for the Geek-theme my friends and I are going to pull off at the Ren Faire this year.

Thank you for reading, and happy costuming!



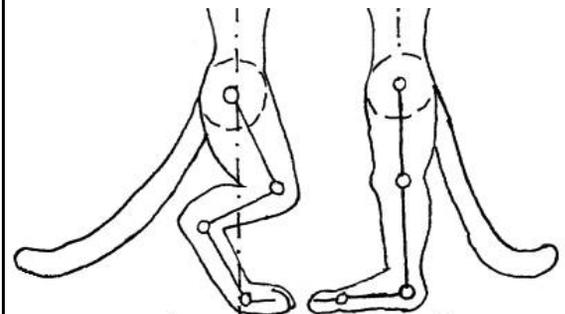
Fursuit layer atop the padded leg layer of the authors digitigrade legs.

Courtney Rayle
 ("Killpurakat") 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 second Masters degree, in Chemical Research.

What is a Digitigrade?

According to the [Wikipedia article](#), a *digitigrade* is an animal that stands or walks on its digits, or toes. Digitigrades include walking birds (what many assume to be bird knees are actually ankles), cats, dogs, and many other mammals, but not [plantigrades](#) or [unguligrades](#).

Humans usually walk with the soles of their feet on the ground, in plantigrade locomotion. In contrast, digitigrade animals walk on their distal and intermediate phalanges. Digitigrade locomotion is responsible for the distinctive hooked shape of dog legs. Digitigrades generally move more quickly and quietly than other mammals.



digitigrade plantigrade

Digitigrade vs. plantigrade legs. From [Wikifur](#).

Fursuiters who portray digitigrades try to achieve the same stance through the use of various techniques, including stilts and padding. Most create their own devices, but there are several companies such as [Area 51](#) who produce high-end digitigrade stilts for professionals and serious hobbyists.