Introduction: How to Make a Projection Screen That's Also a Painting

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I had this idea that I would make a projection screen that doubled as a painting when you flip it over. I liked the thought that it would look like I didn't have a TV at all while at the same time getting a cool piece of art that I actually made myself. It turned out to be a lot of work but I'm very satisfied with the result even though a lot of things didn't turn out as I thought (some better, some worse).

Anyways, I thought I'd collect what I learned and publish it so that people can go ahead and make even cooler screen+painting combos.

Step 1: Get the Stuff

First thing to do is to build the frame. I went to the lumber yard and got regular unfinished lumber (40mm x 30mm) to make the inner frame. I also got some finished wood to use as the outer frame. You also need some L brackets, wood screws, a staple gun and a miter box (if possible though, use one of those miter saws that are attached for better precision).

The picture is missing quite a few pieces, but you probably know what they look like anyway.

Step 2: Make the Inner Frame

Now it's time to make the inner frame. Just saw the unfinished lumber to make a rectangle of 16x9 proportions (I made miter joints but it's probably easier and better to make regular joints since these won't show anyway). To ensure the structural integrity of the thing I also put a cross in the middle.

Step 3: Clothing It

So far so good, the next step is to drape the thing. I started with the side that was supposed to house the painting, mostly because I had the material for that side already but also because that material was much thinner and wouldn't interfere with the tensing of the material on the other side. For this I used regular opaque roller shades from IKEA. It's important to check so that there

aren't any sharp corners sticking out (since I'd made miter joints there was this one joint that didn't line up properly and I had to sand it down) that could tear the shades when tensing them. You should have so much material that you have at least 20 cm to pull at at each side.

The tensing process is a lot of work since the fabric need to be stretched really hard in order to avoid ugly bubbling effects. You start out by spreading the fabric centered onto the frame, folding it over the back and putting one staple at the middle of each side on the outside of the frame. Don't put the staples too far "down" or you'll have problems when stripping off the excess fabric when done. The first ones are the most tricky and you might have to pull them out and tighten several times before it looks okay. It's not crucial that it looks great at this stage. You can proceed by putting three or four staples around each initial staple and tighten it until you're satisfied. Always alternate between sides to minimize the risk of pulling the fabric askew since it leads to bubbling.
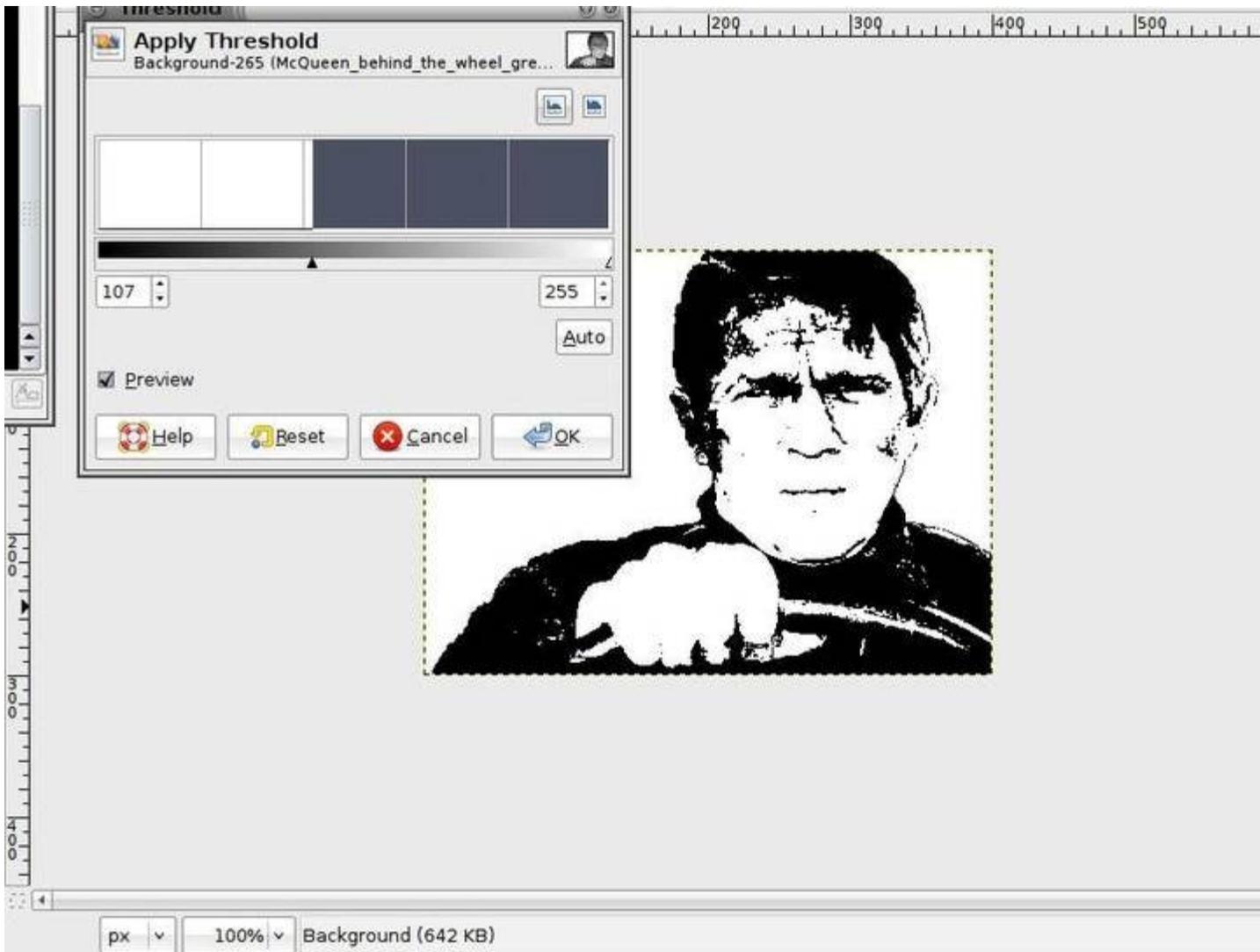
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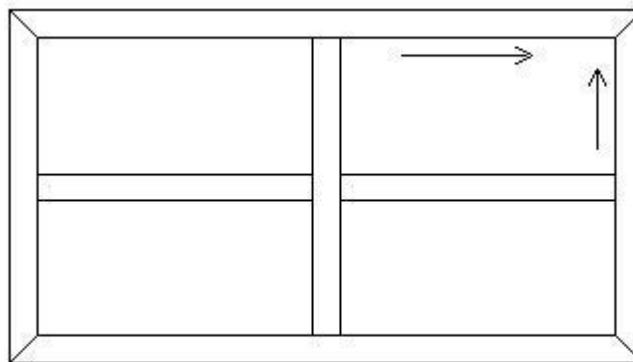
Once you're satisfied with the initial cross you work yourself, one quadrant at the time, out towards a corner. Alternate between sides to get the best possible result and fold it over when you get to the corner. A word of warning: Even though I restretched the whole thing probably four or five times it still had tiny

creasing/bubbles along the frame (especially the morning after), but only if the light was right and I looked at it from a 170 degree angle. I'm deeply anal about these things but in the end I decided that it was good enough and that I probably wouldn't watch movies from that angle anyway...

Then it's time to do the other side. Take care not to get the side that's done dirty in the process since it will be problematic to clean it. The material I used for this is called Barracuda which is a plastic tarp similar to the stuff they use for printing advertising banners on. It's kindof thick, a couple of millimeters at least, so it's much harder to stretch than the shades and you should probably get a mate to help you out. Aside from that the process is pretty much the same. Remember to start out by stripping the excess fabric left from the other side using sharp scissors though (box cutters are too imprecise for a good result).

Step 5: Bring in the Gimp

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Before putting on the outer frame you should paint the edges so the part where the outer frame meets the painting looks as good as possible. But in order to do that you have to know what you're going to paint. So you start out by finding a nice motive. Things to keep in mind at this stage is to pick an image that will look good in only two colors. This means avoiding images with lots of clutter and small details. I knew I wanted to make the painting film themed and looked at a lot of Bogart pictures, sadly almost all of them were too cluttered to work and since Steve McQueen is the coolest thing ever to walk around in a pair of pants I finally settled for scenes from Bullitt.

So with that we turn to Gimp (I'm sure a number of other applications will do just as well, but the examples will be in Gimp). First off we convert the image into greyscale (Image->Mode->Greyscale), then we erase the details we aren't interested in, this makes the following step somewhat easier. The next step is the Threshold tool (Tools->Color tools->Threshold) where you can fiddle with the detail level until you're satisfied.

Before moving to the next step we need to make sure that the white parts of the image are transparent rather than white (they

probably aren't). Easiest is to go back to RGB, add a background layer and flood fill it with some other color and make sure that there is an alpha channel present (Layer->Transparency->Add Alpha Channel). Then use the wand (actually, "Fuzzy Select" is the proper name) tool and start selecting all the white parts and delete them (zoom in to get the smallest parts).

If the image is small, now is a good time to make it the intended size before applying the Oilify filter (Filters->Artistic->Oilify). Before oilifying the image will be rather "prickly" but the oilifying takes care of that and the end result looks really professional.

Step 6: Be Artistic
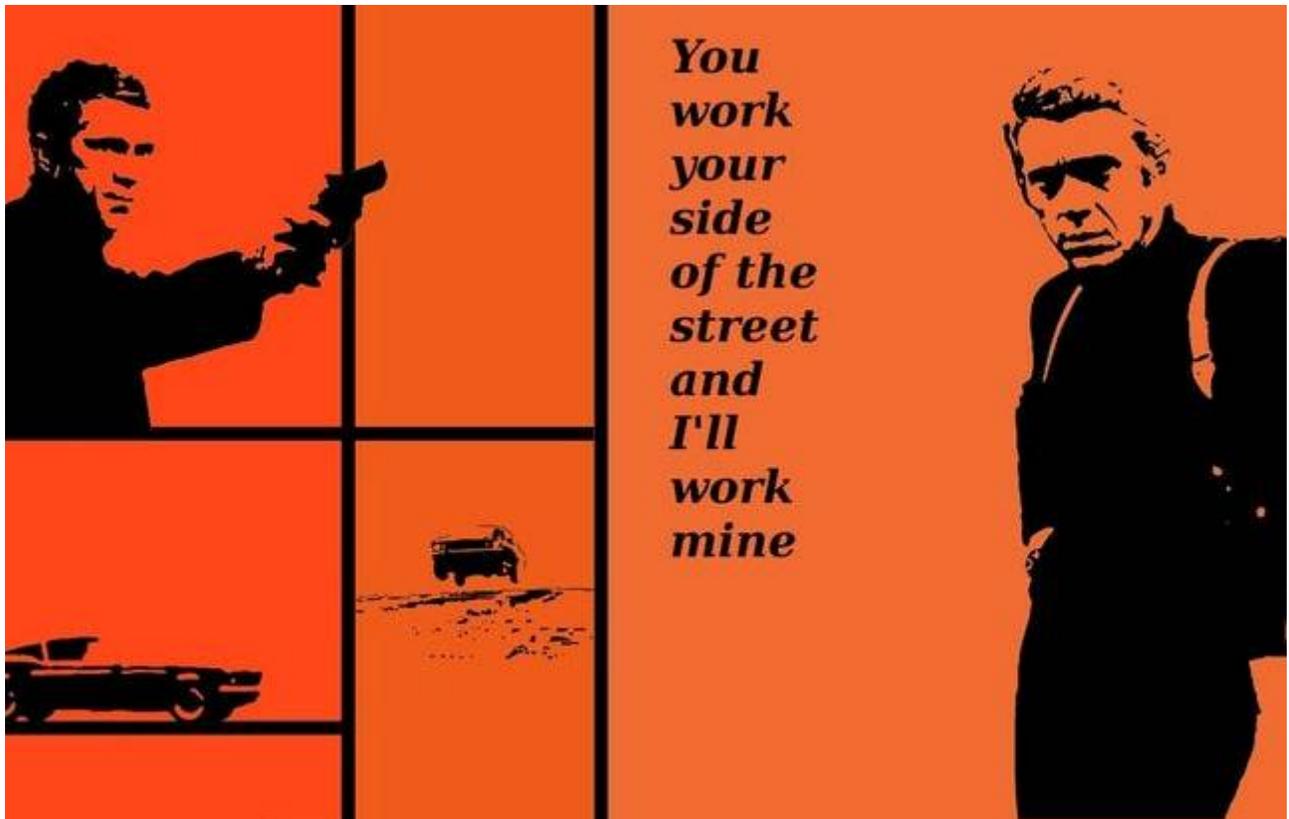
Now for the hard part; composing the painting. I found this old poster in various shades of orange that served as inspiration, so I divided the painting into three vertical fields. I played around with a lot of scenes before settling on four in different sizes. I also decided to have a couple of horizontal divider lines so that Steve's torso would have something to rest on. For a long while I also wanted a quote from the movie in there, but I couldn't find a satisfying font so I dropped the idea (which was probably for the best since it would've been maddeningly fiddly to paint the letters, and I probably would've smudged them as well).

I didn't trust my abilities to mix shades consistently so I just got the three different oranges that were available (acrylic colors) at my local paint pusher.

Step 7: Paint the Whole Shebang

Now we go back to where we left off earlier; painting the edges. This I did just so that I wouldn't have to go too close to the outer frame and dribble paint all over it, and so that there wouldn't show any white parts between the outer frame and the actual canvas. This can actually turn out to be a problem since the surplus canvas, especially at the corners where you have to fold it, gets rather thick. So take care to paint the edge of the thicker plastic canvas or you'll go nuts noticing it.

Once you're done painting the edge you screw on the outer frame. Now, if I got to do it all over, I wouldn't have chosen to do the outer frame in two pieces. The original plan was this: the outer frame would consist of eight finished and miter jointed pieces (30mm x 17mm each) forming a two-layered frame. The first four, inner, pieces would be fastened by screws and then the outer framed would simply be glued onto the inner one, that way I couldn't have to cover up ugly screw heads. This was a bad idea because of the miter joints. Since I kindof skimped on the miter box, the precision wasn't really up to par, but even if it had been, it would have been almost impossible to get all the sixteen (yeah, that's right) angles to align properly. You also need to screw in the loops from which to hang the whole thing.

Oh well, time to paint. I hung the screen and fed the image to the projector. The first thing you should do is to put masking tape along all straight lines since it's harder than it seems to paint along a straight line. I thought I could get away with it but had to go back and redo the lines afterwards. Be sure to seal the edges of the tape as seen in the pictures so that the paint doesn't bleed in under the edges of the tape.

After the lines are done, the rest is just hard work. I figured it would take a couple of hours, but it ended up with me going to bed at five in the morning (I'd started painting at about eleven I think, it's all a haze actually). Since I had my flatwarming party the next day I really wanted it to be ready by then.

Step 8: Lessons Learned

I'm quite pleased with the end result, but it was a lot more work than I'd expected. The only thing that's still bugging me are the corners. I'm thinking of putting a piece of sheet metal around each corner to cover up the actual joint if I only can figure out how to make it look good. I will probably paint it black as well and would welcome suggestions on how to best make the paint stick to the

metal.

Anyways, the joints on the inner frame and the outer one are really the only two thing I would have made different if I did it again. Now go forth and make even nicer paintings!