Seamless Texture Creation with Krita

by João Queiroz e Lima

0. Introduction

In this 5 minute tutorial we are going to turn a photo that we found online, into a seamless texture that we can use as Base Color for a PBR material.

PBR stands for Photorealistic Based Rendering, it's been standard for Architecture Visualization for a long time, but it is now being widely adopted by other industries relying in computer graphics. You can read a nicely detailed description about this material creation workflow here:

https://academy.substance3d.com/courses/the-pbr-guide-part-1

The photo we will base our material was taken by Pete Willis and is freely available on Unsplash. You can find a bunch more excellent examples there, either taken by him or by other Unsplash artists/curators.
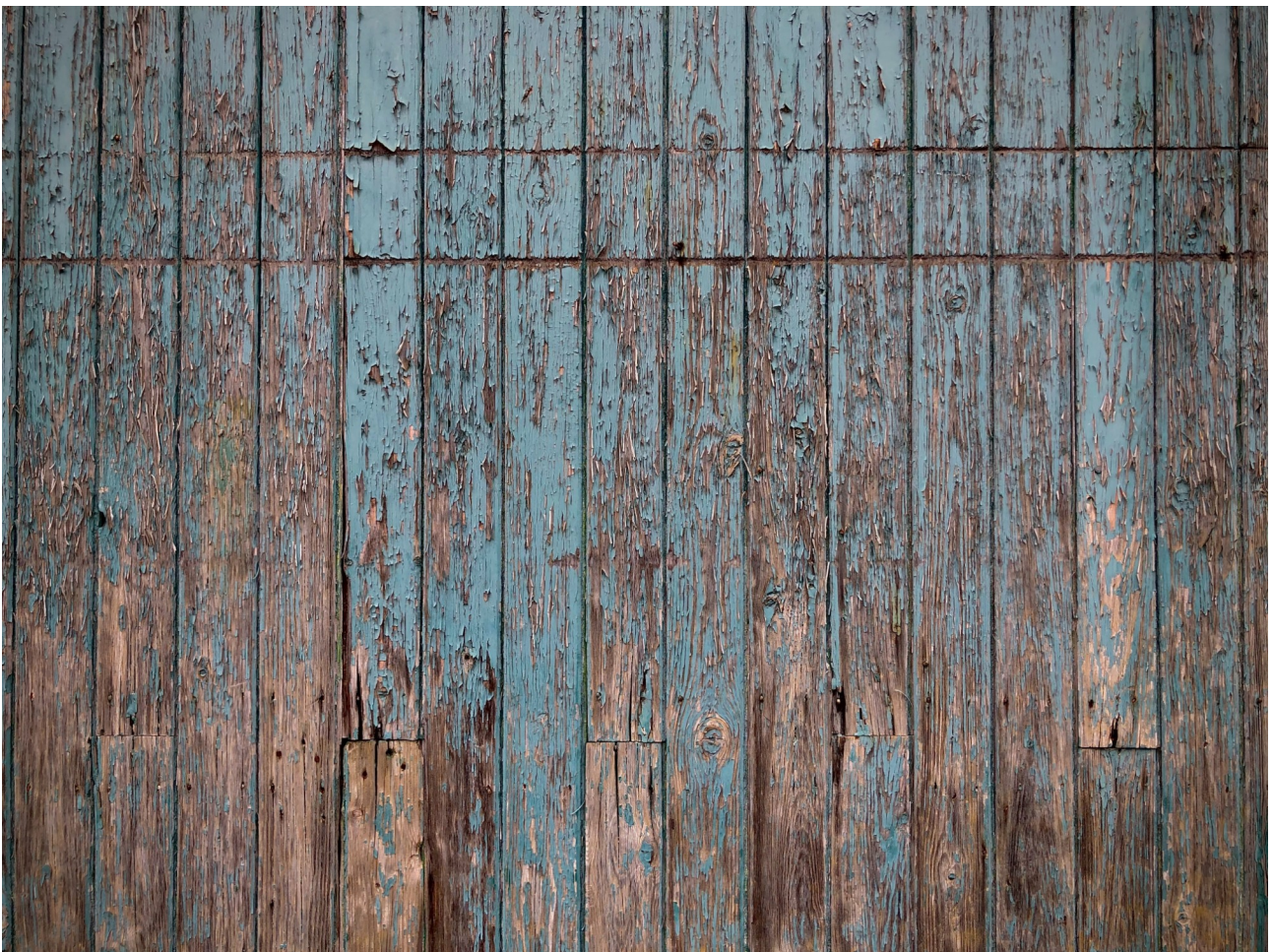
The tutorial will be based in **Krita 4.4.1 for Windows** but it should be able to be followed in other platforms as Krita is platform agnostic.

1. Opening File + Activate Wrap Around Mode

As you open Krita a welcome scree will allow you to open or drag and drop a file, as well as giving you access to your recent files. Alternatively you can close this window and use **File > Open** or **File > New** and **Layer > Import**. You can also setup Krita to automatically open your files.


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Krita - Opening File
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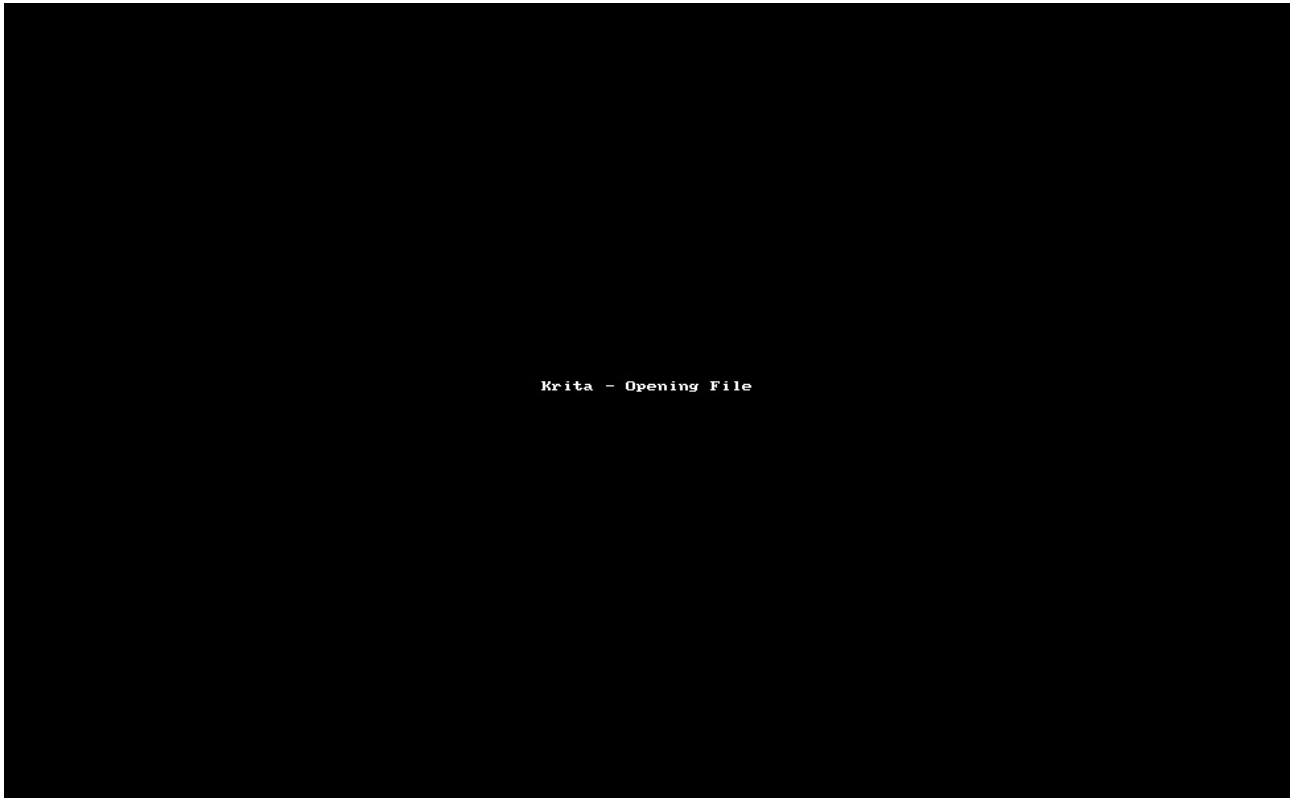
After opening the file you can see how it works as a seamless material by activating **Wrap Around Mode.**

2. Setting Up a Shortcut for Wrap Around Mode

As we are going to use this mode several times in this tutorial it's convenient to set up a shortcut for it. I'll use **W:**

1. **Go to Settings > Configure Krita**
2. Find the **Shortcuts** panel icon on your left

3. On the top search box start typing Wrap and the search filter should be fast to show the **Wrap Around Mode** command

4. Click it and click the box button next to **Custom**:

5. Hit **W** key.

6. Press the **OK** button in the bottom of the Settings Panel

Now on Krita you can hit **W** to toggle **Wrap Around Mode.**

Krita – Wrap Mode Shortcut

3. Preparing Image Geometry – Vertical and Horizontal Guides

Most times texture pictures are taken slightly tilted or with a slight perspective. If the materials being pictured are random, or don't have clear geometry this might be negligible, however, for most human made materials seams, joints or other geometric elements that form patterns,

To create seamless textures from images with geometric patterns the first step is to make the geometry in each border match the opposite border, for it to be continuous. The process will envolve Krita's transformation tools and cropping the image so it's basic geometry aligns in horizontal and vertical directions.

Our example picture features vertical lines for wood planks, we just need to be concerned that the geometry matches vertically as we will be able to take care of other minor horizontal features later.

For more complex geometrical patterns the tiling might have to be performed both horizontally and vertically but the principles we will use for vertical tiling will be the same for horizontal.

To help us align the images vertically or horizontally Krita allows us to use Guide Lines but for them to be shown, created and edited we have to activate some settings:

1. Go to **View** menu and activate **View > Show Rulers** and **View > Show Guides**

2. On **Settings** menu activate **Settings > Dockers > Grid and Guides**

3. A new docker will appear on your docked panels, even if it's tabbed in an already existing panel.

4. In this docker you can configure Krita's Grid and **Guides**. You have a tab for each. Click the Guides tab.

5. On this **Guides tab** choose a **stronger color for your guides**, that contrasts with the image you're working with. Click the button at the right of the **Guides: Lines** which displays a color that might be dark grey on the first run.

6. You can also change the Guide's linetype by hitting the Lines button.

7. **Rulers** will now also be visible on top and left of the canvas**.** If they're not, you can also make them visible from the Guides Docker.

8. To **Create a Guide y**ou must click and drag your mouse on a ruler and move it to the top of your canvas.

9. If **Wrap Mode** is active it might be hard to drag your ruler to the right spot. Hit **W** to deactivate it and drag again.

Krita - Guides

4. Perspective Transformation

The transformation we usually need is to correct perspective. Krita features a single tool for transformation actions and this tool has a subset of tools. The default is the scale tool but you should investigate other transformations as they are very powerful and might be helpful in future scenarios.

Krita – Transformation Tools

Our objective will be to align wood joints vertically so we should start by creating two guides at the extremes of the image, were deformation is bigger:

Krita - Setting Guides

Using the guide lines for reference we will now perform the Perspective Transformation:

1. Click the Transformation tool,

2. Select Perspective Transformation tool (second icon),

3. The first thing you'll notice when trying to transform the Layer is that as soon as you start deforming it, guidelines will be hidden.

4. Slide down the **Background Layer's opacity slider** like in the animation below to around **50%**

5. After that you can keep transforming the layer by using the **corner handles** on the perspective transformation tool.

6. Keep zooming in and out and panning around so you have more control and also to avoid any Krita snapping that might be active. You might deactivate snapping on the Grid and Guides Docker.

7. Shift the image until the joints align with the corresponding guide lines.

8. Hit **Enter/Return key** on your keyboard when you're finished.

Note: On more severe transformations finishing one side after having done the first side will probably deform the first. You should check both sides before hitting ENTER to comit the transformation.

Krita - Perspective Transformation

5. Cropping

You should now crop the image so the point it starts will be matching the point it ends. You can either crop at a joint line, if those lines are matching in appearance or you can crop at the middle of a plank if the joints are very irregular or colored differently.

In this example both methods will work so I'll exemplify both.

The overall process for cropping is to:

1. Activate the cropping tool.
2. Click on the first corner of a rectangle that represents the cropping.
3. Click on the second oposite corner of the rectangle
4. Fine tune by zooming, panning and dragging the resulting rectangle
5. Hit enter to commit.

> *Note: Sometimes our transformation action leaves some transparent pixels on the margins of the image. Take care with those while cropping.*

Cropping 1

Krita - Cropping

Cropping 2

Krita - Cropping 2
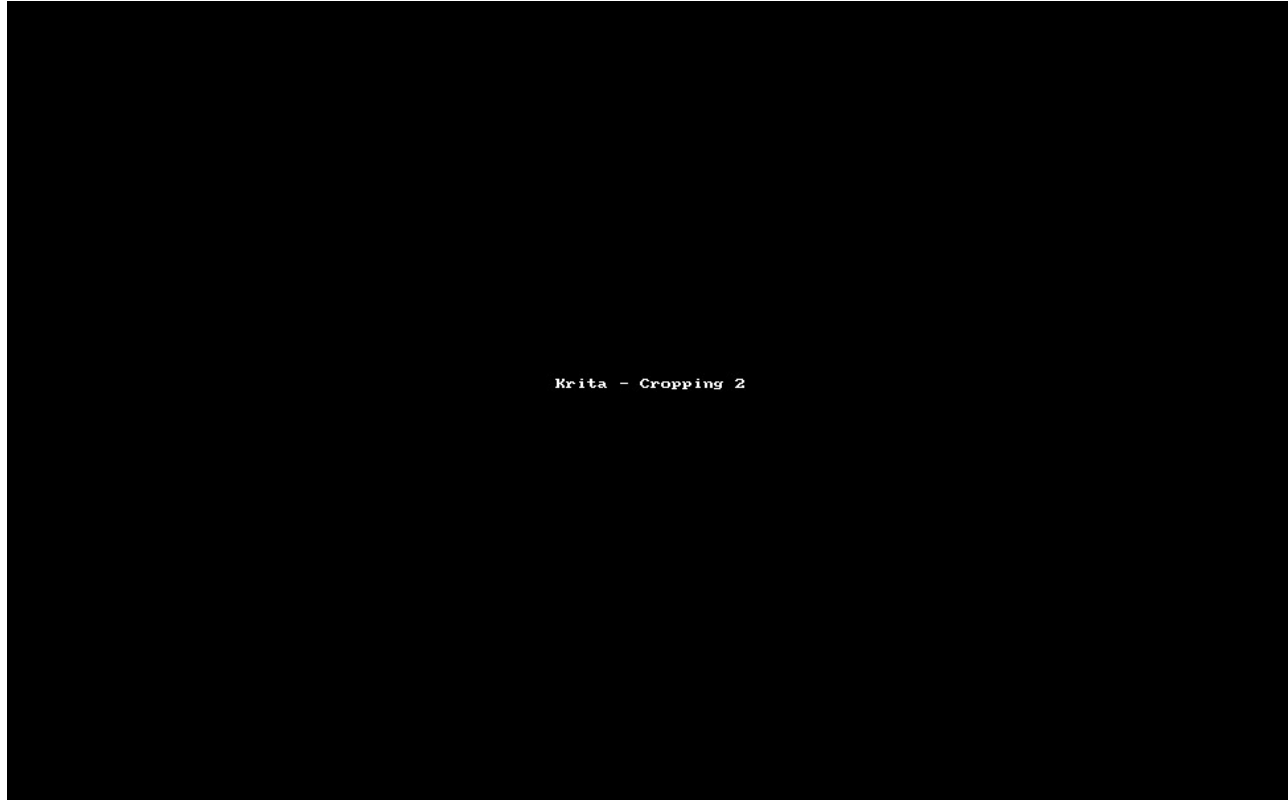
6. Removing Soft Shadow Effects

After cropping we can turn on Wrap Around Mode and also Toggle Guid Visibility off. Hit **W** and go to **View > Guides.**

We can see the globally we now have a fairly good geometric match but in terms of colors and texture we still have noticeable seems as well as areas of the image that are much darker than others.

This is usually due to vignetting effect that is either introduced by the camera or post producion effects on the original image. It might also be related to some objects casting shadows on the geometry. If this shadows are soft we can try removing them, if they are hard shadows, removing them will be very difficult.

We will try to get rid of these soft shadows or vignetting in a fast way, using pixel information on the original layer:

1. Make sure that Wrap Around Mode is Turned On

2. On the **Layers Docker** Duplicate the background layer by **Right Click** on it and choosing **Duplicate Layer or Mask**

3. Desaturate the new Layer by clicking on it and going to **Filter > Adjust > Desaturate.**

4. You can accept the standard desaturation mode but usually it's better to use the one that gives you **higher contrast.**

Krita – Duplicating and Desaturating the Layer

The next step will be used to remove shadow information to the background using this desaturated layer.

1. Make sure the **Desaturated Layer is selected** and change it's blending mode to **Grain Extract**.

2. Do this by clicking to the **Layer Blend modes dropdown** menu on the top of the Layers Panel. It's a button that reads Normal, above the opacity slider.

3. You'll find **Grain Extract** in the **Mix** submenu in the bottom of the list.

4. While you're at it click the **box next to Grain Extract** to make it a favorite, and readily accessible at the top of the list.

5. You'll notice that the result will be an image with basic colors and the darkest pixels have been reduced to grey.

6. Now we'll blur the image by Going to **Filter > Blur > Gaussian Blur.**

7. Slide the top slider to something about **100.**

8. You'll notice texture **detail will start to pop up again**. The image will increase texture definition while also getting rid of the shadow fills caused by the soft shadows or vignetting.

9. Fine tune the **Opacity slider of this Layer**, to have a less intense effect and fine tune it until you feel it's right. Info.

Krita - Using Grain Extract
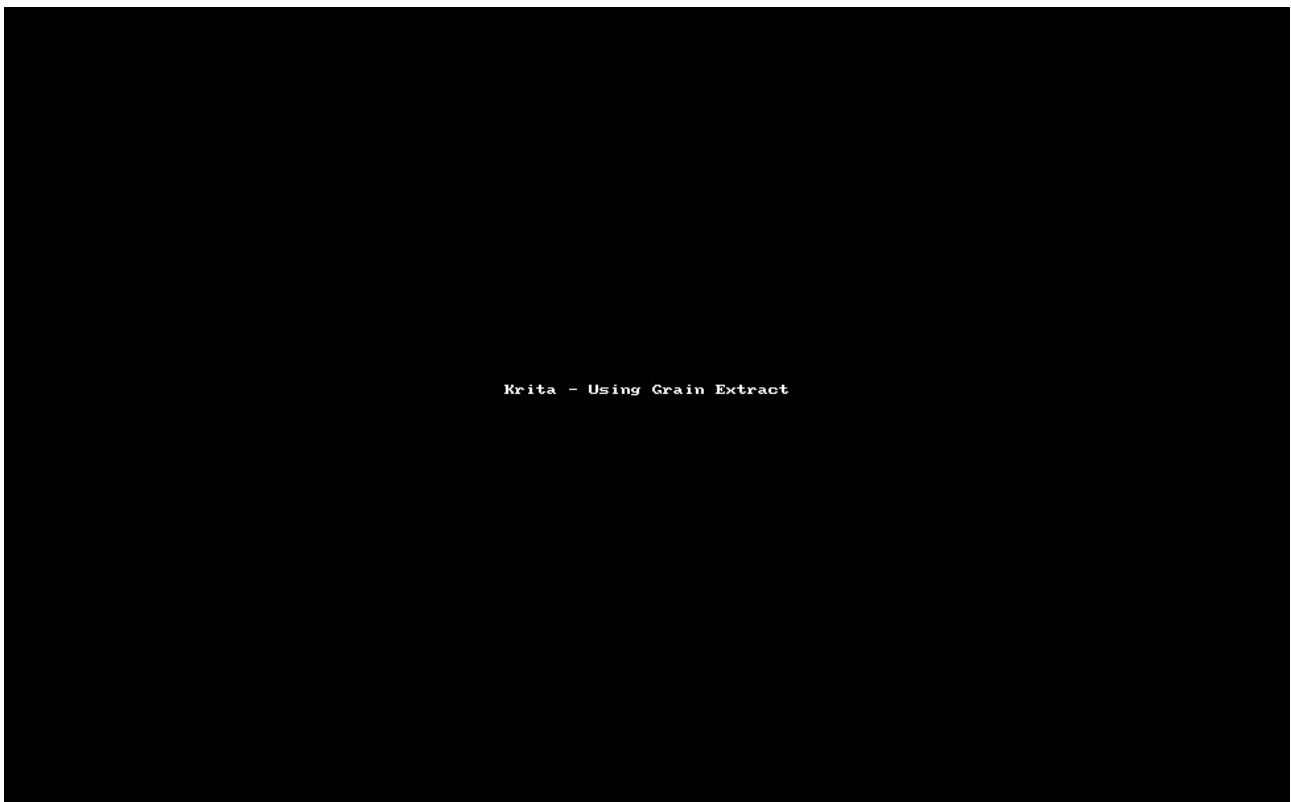
The idea here is to get rid of darker areas and projected shadow artifacts to get the basic colors with no lighting info. The lighting info will be given by your render engine when it renders. Having

shaodow on the texture will create noticeable errors on your final image, as the lighting effects on the texture will conflict with the light being produced by the render engine on the surface.

7. Save a Duplicate of Your File and Merge Layers

When you're happy with the results you will have to consolidate the final image by merging Layers.

If you don't do this the final step will not work right as it requires a single Layer. In order not to loose the possibility of fine tuning the last step and produce a more expressive image to use for other purposes besides rendering, you should save a duplicate now and then merge layers.

1. Save your file with a different name;

2. Save it again with the final name;

3. Right click on the Desaturated layer and select Merge Layers.

4. Save the file again.

Krita - Merge Layers

5.

8. Removing Seams and Exceptional Features

The final step of the process involves removing seams and, if you really want to be precise, removing exceptional features. Seams will be the obvious issue that breaks texture continuity,

however, exceptional features on a texture, also contribute to see the pattern repetition and break realism.

Though the concept is very easy to grasp, this is the most demanding part of the process, as it involves using a Clone tool.

You'll notice that Krita's clone tool isn't an individual tool as it is in most image editing software as Photoshop, Affinity or Gimp. What happens is that Krita has a very powerful brush system and any of it's brushes can be converted into a clone tool.

I'm not going to go deep into that regard though, as one of Krita's brushes is the Clone tool and it works very well. You just have to search for it, among the hundreds of brushes there are available like this:

1. On the **Brush Presets Docker** click on the dropdown list and find the **Digital** Submenu;

2. You'll find the **Clone Tool** in the bottom of that List.

3. To work with it you can leave default values and just change the size of the Brush in the Top bar or, if you want to be fast, by **Holding Down SHIFT+Left Click and Drag the Mouse Left or Right** to decrtease or increase the Brush's size.

4. You'll also notice that the brush pointer has two circles. One is the actual Brush and the other represents where's the clone being referenced on the image. To use the brush you must first find which part of the image to reference. To do that, you hold **CTRL** key and click on your image.


Krita – Clone Tool

Removing Seams

In this case we'll have a very difficult task ahead as we will have to break a huge color difference from the bottom to the top. Using the clone tool we have to keep an eye on geometrical features in the image and try following them.

Being careful where to pick the reference and how big should the Clone brush be, we can try figure out what should match what. This is a trial and error process where the only rule is:

If it seems right it's right.

Krita – Working with the Clone Tool
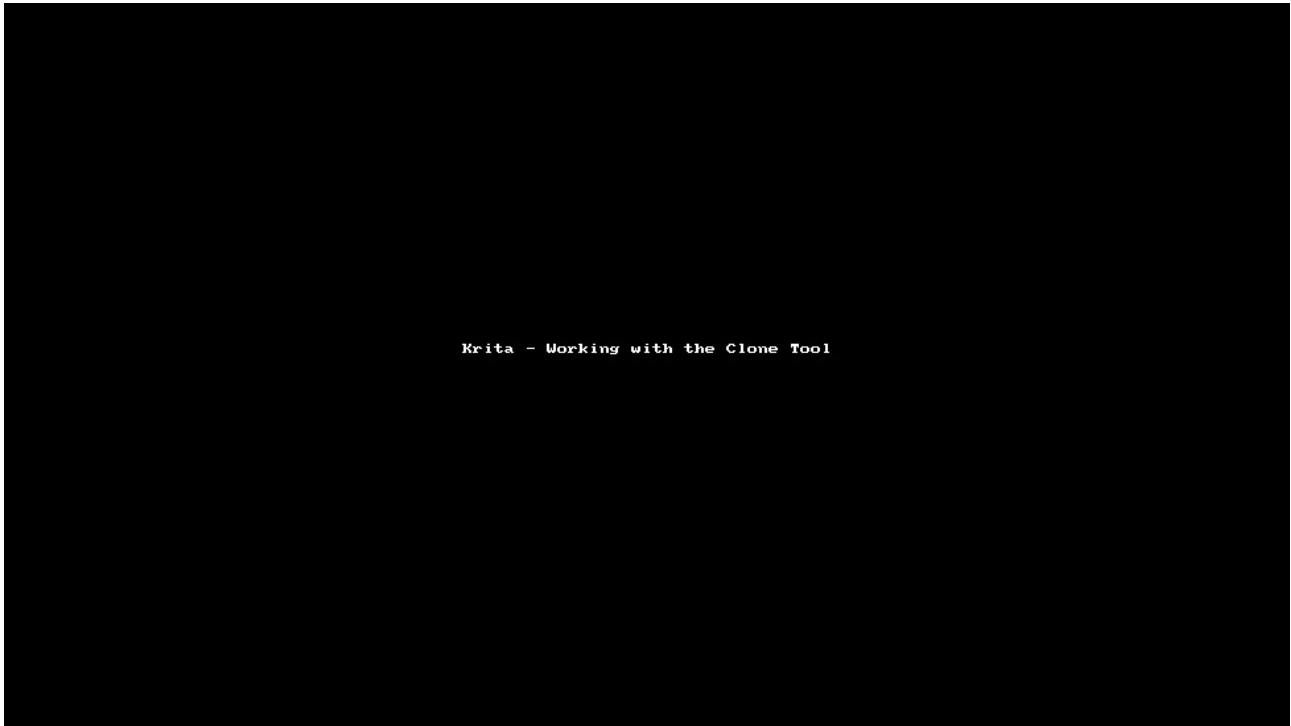
I've managed to remove seams and use one of the existing features to create the transition between colors.

Removing Prominent Features and Details

However, zooming out, we can clearly see clear repetition arising on the most prominent features:

If we zoom in a bit we can also see even more evident repetition, in this case of some details:

We should consider what to do with these as:

- Imperfections matter for the quality of some materials. Without them the materials will be less interesting.

- However, on bigger buildings, those features might cause more harm than richness as the tiling they produce is obvious.

For the sake of this tutorial, using the clone tool again, we will remove them:

Krita – Removing Prominent Features

9. Final Output

You have to consider what will be the purpose of the final image. If it will be used in any offline renderer the size of the image is irrelevant as long as you have RAM or VRAM available in your system to hold up all the assets of your render. However, if you're going to use the image in realtime render engines you should consider that a square image with a power of two pixel size be needed.

I always export as a power of two version for flexibility. However, with images like this which are very far from square, I first export it at real size and then create a second version as power of two.

Export at Real Size

To export the image you go to **File > Export** and replace the extension from **.kra** (Krita's native file format) to the format of your liking. I use PNG as I can later add transparency to it if I like, without having to replace the image reference on my render engine.

In the following example I do not use compression for saving the image, but that is usually overkill as the size of the image will be huge. Having no compression will only allow me to further edit it if I like, without loosing quality with each edit.

Krita - Export

Export as power of two version

To play it safe I don't like to scale the **.kra** working file, I tend to save a lot so I will proably ruin it. So I open the exported version instead, scale it to the power of two and then export it. Saving will only ruin the first export.

Krita - Scale

10. Final thoughts

I'm not a professional renderer, just an architect that considers rendering as a part of the process and the best way to integrate materiality into the conceptual process.

As an architect I don't really like to waste time with too much work but I do like to have things looking good. In that sense, this is the fastest way to create a good quality seamless texture I know of, and I do use Substance tools, Affinity Photo, Gimp and have tried many others in the past. This is the one that yields the best results, with minimum control too.

Having said that, for I don't usually deal with very geometric patterns unless I'm creating them from scratch. That might get tricky but it will be tricky with every software.

I hope it's been useful and I also hope you'll consider Krita as an extra tool in your arsenal and explore it's huge creative potential. It won't let you down.

All the best and see you next time,

João Queiroz e Lima

www.casca.pt