

I implemented the 2D texture synthesis algorithms by image quilting. The algorithm is like the one described by the paper "Image Quilting for Texture Synthesis and Transfer". The only difference is that when I search the block for synthesis, I use the block with minimum overlap error, instead a set of blocks. (see Figure 1)

The algorithm is described below:

1. Pick a block from the original image randomly.
2. search a block with the minimum overlap error with the current image.
3. compute the minimal cost path and make the boundary of the new block.
4. paste the block onto the texture
5. repeat from 2

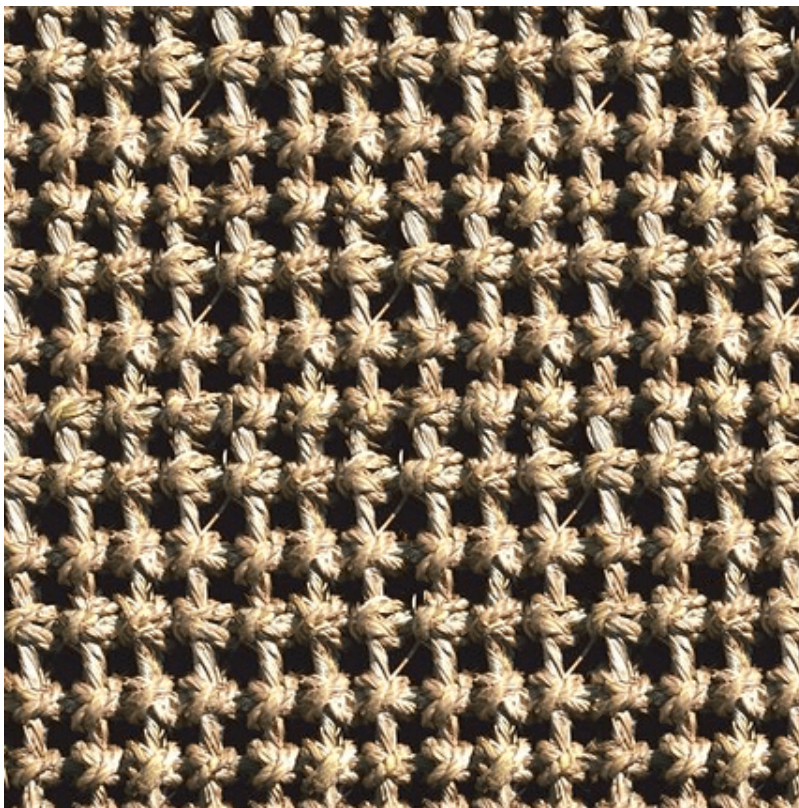
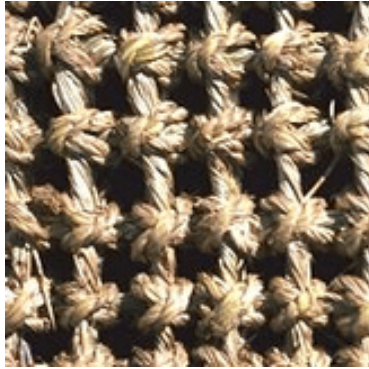
After that, I mapped one of the generated texture to the sphere. I used the algorithm described in the paper "Reaction-Diffusion Textures" to minimize the distortion of the texture mapping. (see Figure 2)

Suppose the polar parameters of the sphere are θ and ϕ , so the sphere is $x = r * \cos(\phi) * \cos(\theta)$, $y = r * \sin(\phi) * \cos(\theta)$, $z = r * \sin(\theta)$.

If I use (ϕ, θ) as the texture coordinate, the texture mapping is distorted. Through computation, if I use (ϕ_1, θ_1) as the texture coordinate, (use $\phi = \phi_1 * \cos(\theta_1)$, $\theta = \theta_1$ to get the relevant texel), the texture mapping is corrected.

Result:

Figure 1:



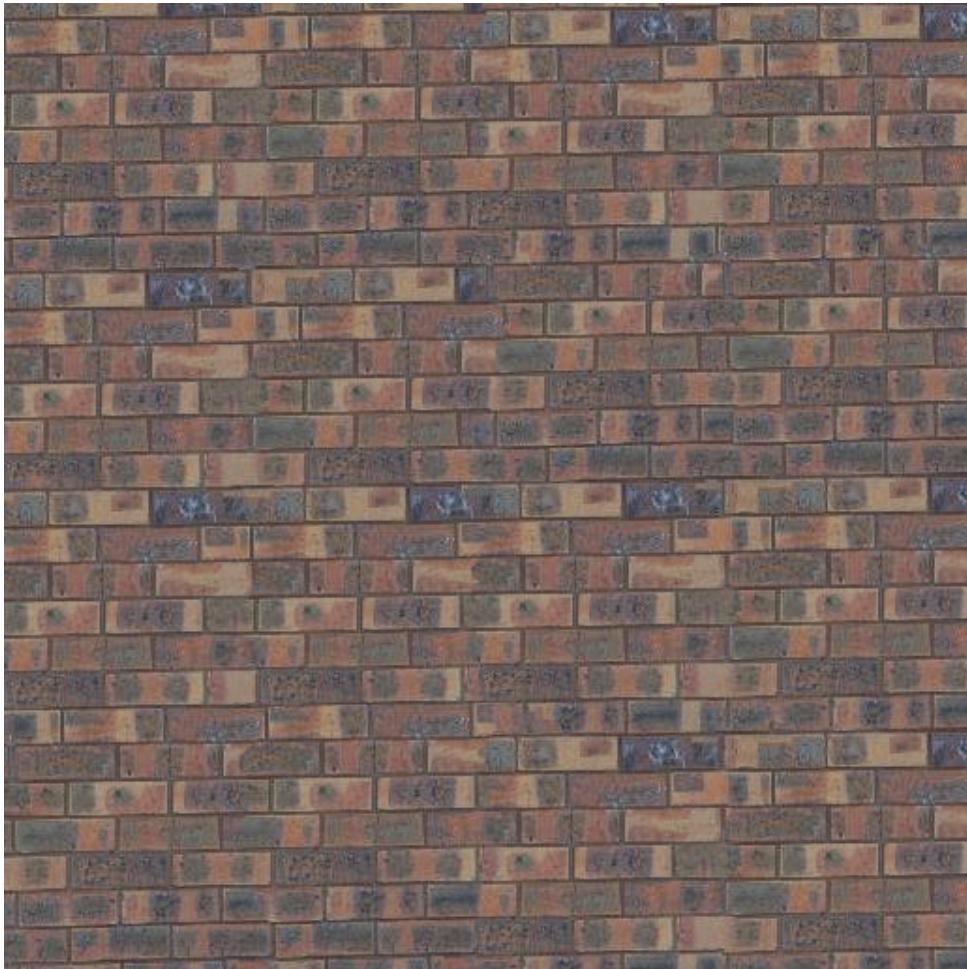




Figure 2

