IMAGE QUILTING FOR TEXTURE SYNTHESIS AND TRANSFER

- Our project is based on the following paper :

    http://graphics.cs.cmu.edu/people/efros/research/quilting/quilting.pdf

- Quilting algorithm
    - Go through the image to be synthesized in raster scan order in steps of one block (minus the overlap).
    - For every location, search the input texture for a set of blocks that satisfy the overlap constraints (above and left) within some error tolerance. Randomly pick one such block.
    - k. Compute the error surface between the newly chosen block and the old blocks at the overlap region. Find the minimum cost path along this surface and make that the boundary of the new block. Paste the block onto the texture. Repeat

Minimum Error Boundary Cut :

$$E_{i,j} = e_{i,j} + min(E_{i-1,j-1} , E_{i-1,j} , E_{i-1,J+1})$$

After DP above, the minimum value of the last row in E will indicate the end of the minimum vertical path through the overlap surface and we can trace back to find the path of the best boundary cut through the overlap region

TEXTURE TRANSFER :

- If we modify the synthesis algorithm by requiring that each patch satisfy a desired correspondence map, C , as well as satisfy the texture synthesis requirements, we can use it for texture transfer.
- The correspondence map is a spatial map of some corresponding quantity over both the texture source image and a controlling target image.
- For texture transfer, image being synthesized must respect two independent constraints:
  - the output are legitimate, synthesized examples of the source texture
  - that the correspondence image mapping is respected.
- Hence, we modify the error term by the use of an 'alpha' parameter.
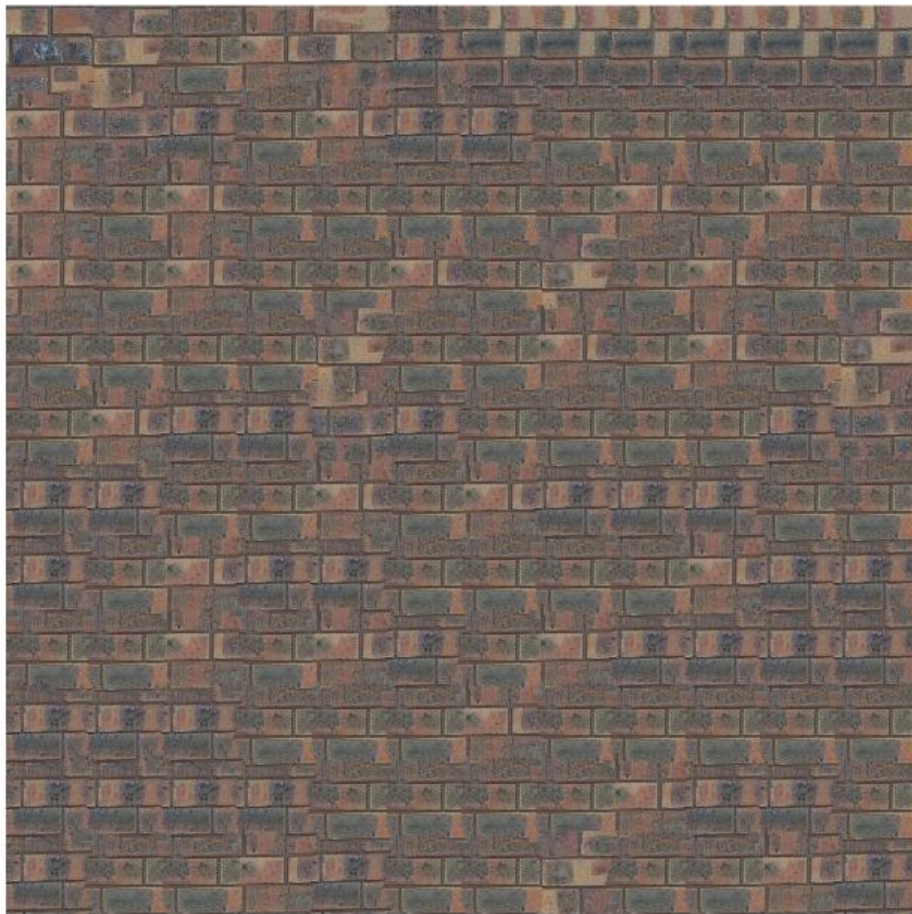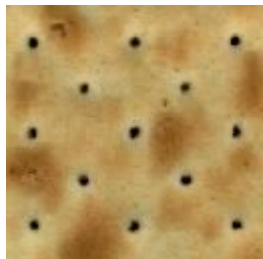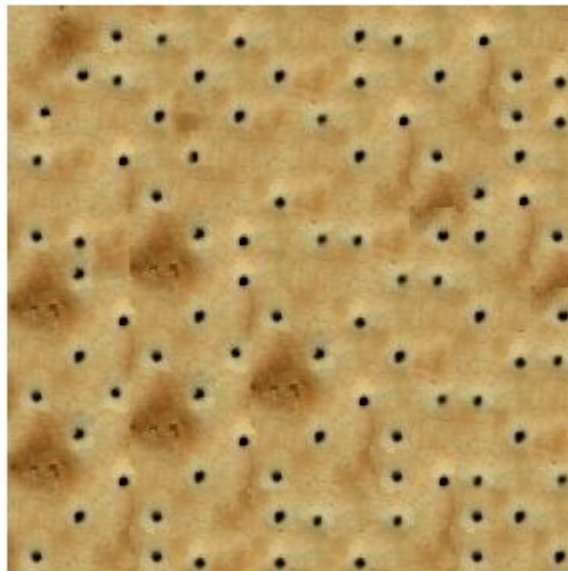
RESULTS

texture

Synthesised image

texture

Synthesised image

texture

Synthesised image

Texture Synthesis

Texture Synthesis

Texture Transfer

Texture Transfer

THANK YOU!