Image Quilting for Texture Synthesis & Transfer – Team Zamipanyap

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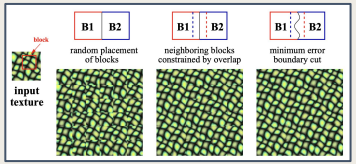
BROWN

CSCI 1430

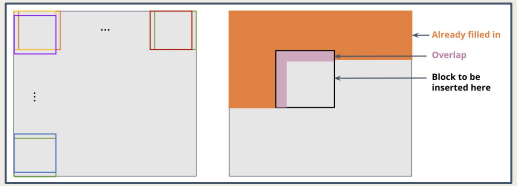
Goals

- **Quilting:** Synthesize real-looking textures of arbitrary size from small samples
- **Transfer:** Recreate target images using textures (non-abstract) from source

Methodology

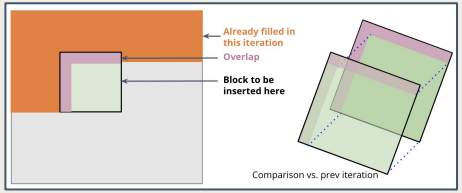


Quilting



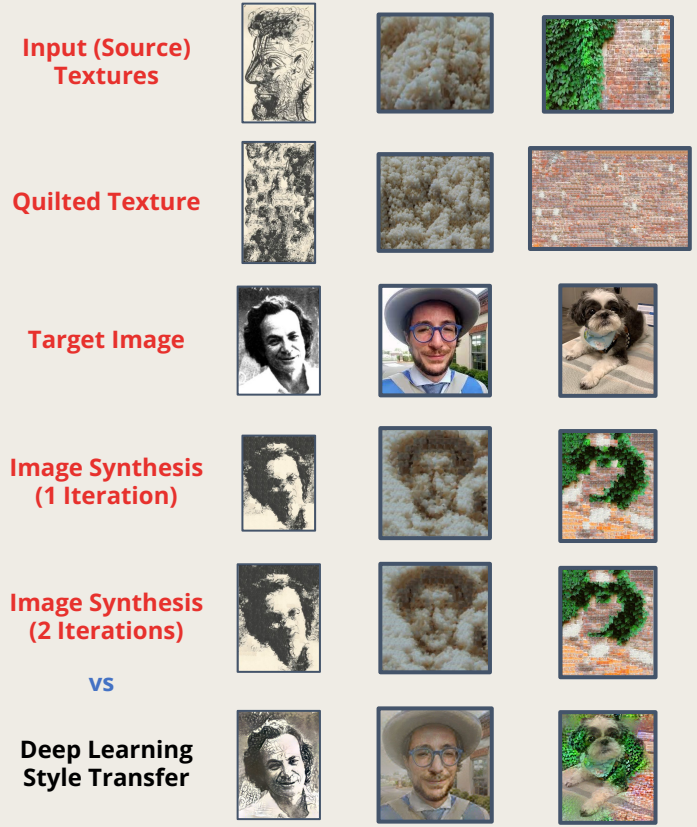
- (Left): Divide input texture into blocks
- (Right): Find best block for new location + Minimum error boundary cut

Transfer



- Divide input texture into blocks (similar to quilting)
- Compute overlap error (pink)
- Compute overlay error versus previous iteration insertion (green)
- Compute correspondence map between block and target image
- Find best block + minimum error boundary cut

Results



Extra Results

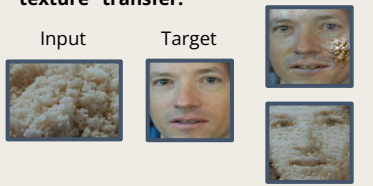
"The Dynamic Trio" (2023, digital image)

DL Methods Comparison

- **DL Approach:** abstractly tries to apply "style" → similar techniques with lines, strokes, etc.
- **Our Approach:** concretely uses physical texture blocks to create transfer result (non-abstract)

DL works better with "style" transfer:

Our approach works better with "texture" transfer:



[1] Alexei A. Efros and William T. Freeman. 2001. Image quilting for texture synthesis and transfer. In Proceedings of the 28th annual conference on Computer graphics and interactive techniques (SIGGRAPH '01). Association for Computing Machinery, New York, NY, USA, 341–346. https://doi.org/10.1145/383259.383296
[2] Gatys, L. A., Ecker, A. S., & Bethge, M. (2015). A Neural Algorithm of Artistic Style. ArXiv [Cs.CV]. Retrieved from http://arxiv.org/abs/1508.06576