Then Try This • Algorithmic Pattern Salon

Prairie Patterns

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Then Try This

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ABSTRACT

In this experiment, I have developed a fabric algorithm to generate patterns inspired by the traditional block-printing techniques and designs of Indian textiles. In this algorithm, the patterns and variations in parameters are fairly simplified, however it is open to placing in any image as the building block of the pattern that is repeated on borders and grids in the design. Here, I have used this algorithm to generate prairie patterns that are based on my visual observations and sketches of various plants, as a way of showcasing prairie environments and carrying on the tradition of understanding and portraying a place through textile design: gathering snippets of my surroundings and preserving these patterns and organisms through the threads and traditions of pattern making.

Prairie Patterns

Crafting fabric algorithms inspired by prairie plants and traditional block-printed textiles

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Summary

In this experiment, I have developed a fabric algorithm to generate patterns inspired by the traditional block-printing techniques and designs of Indian textiles. In this algorithm, the patterns and variations in parameters are fairly simplified, however it is open to placing in any image as the building block of the pattern that is repeated on borders and grids in the design. Here, I have used this algorithm to generate prairie patterns that are based on my visual observations and sketches of various plants, as a way of showcasing prairie environments and carrying on the tradition of understanding and portraying a place through textile design: gathering snippets of my surroundings and preserving these patterns and organisms through the threads and tradition of pattern making.[1][2]

Traditional Textiles and Place-based Influences in India

There are a large variety of techniques and textile patterns across the Indian subcontinent and connected regions, often derived based on the availability of local natural resources such as plant fibers and natural dyes that could grow and be harvested in the region. Additionally, motifs and patterns were often shaped by trade and "floral patterns in Indian textiles became increasingly widespread in the 13th century, and artists excelled in adapting them for global markets."[3] Overall, textile design and manufacturing in India was greatly influenced by the local environment and draws from regional and colonial influences, climate patterns, and observational motifs.
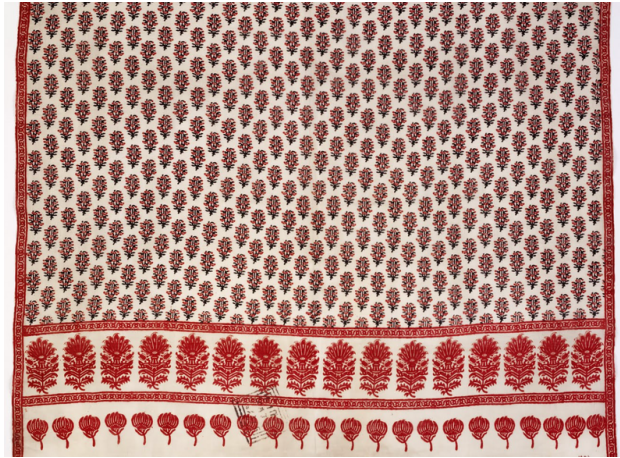
Figure 1
Block printed garment (1850/1879) by
*Unknown, The Victoria and Albert Museum*

> Small repeating plant designs are typical of block-prints from the town of Sanganer, as is the fine cotton on which they are printed. Block-printing can also be used in dyeing. This scarf or shawl uses only red and black dyes, which would each need separate mordants to fix them – alum for red and iron for black. These would be applied with blocks and the cloth would then be dyed. [4]

Designing a simple block-printing algorithm to generate fabric patterns

To generate the fabric patterns, I have decided to start with the basics: borders and grid patterns to emulate the style of traditional hand-block printing as seen in Figure 1. Other related block-printing techniques that I draw inspiration from are Bagh print and Kalamkari. [5] [6] In this experiment, I have implemented the algorithm in p5.js[7] and my code can be viewed on github.[8]

Outline of algorithm inputs
- number of layers
- for each external layer (borders)
  - building block image
  - layer color
  - building block size
  - building block rotation
  - corner building block (size, rotation, image)
- for internal layer (grid)
 - building block image
  - building block size
  - layer color
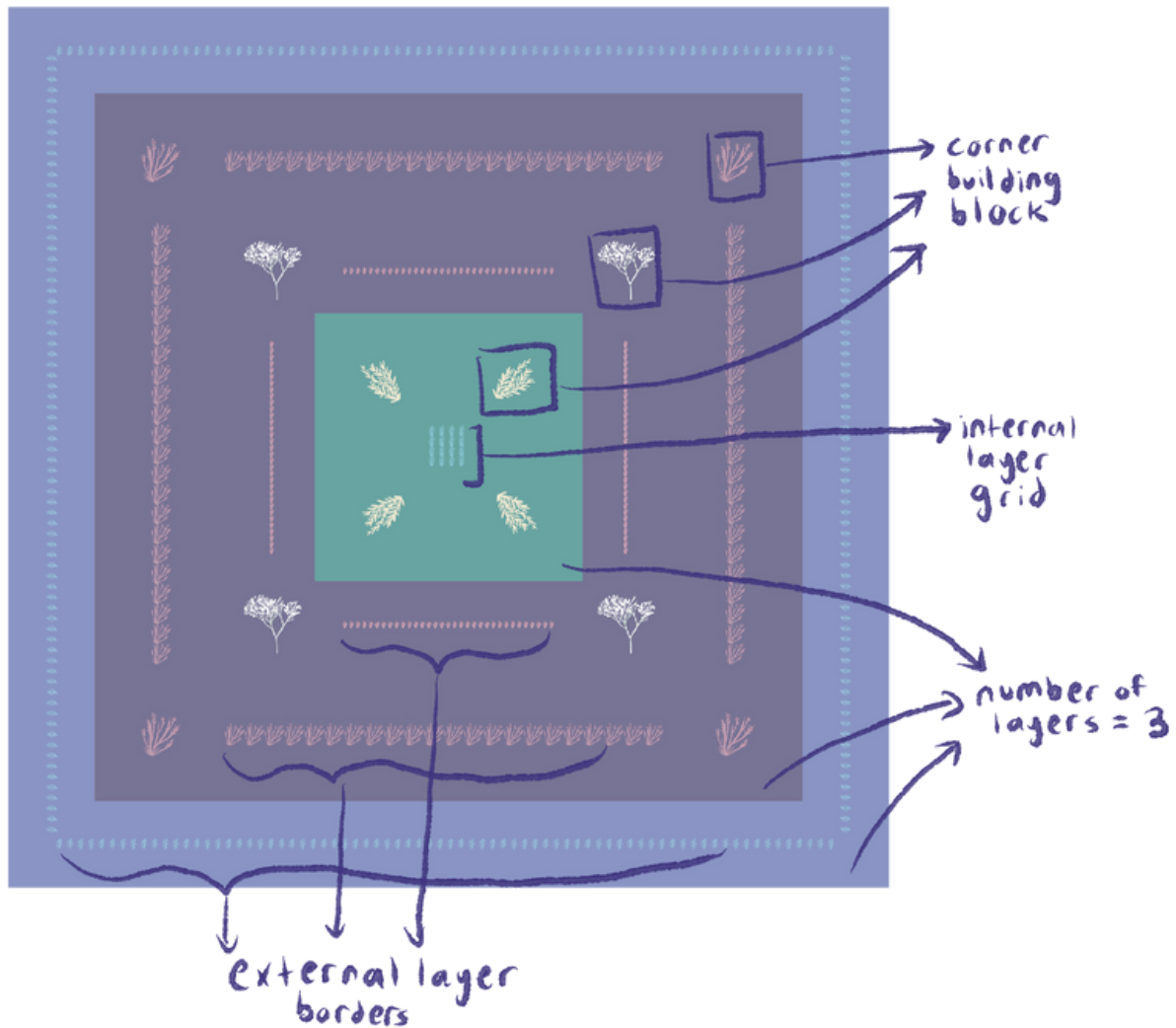
Figure 2
Breakdown of the algorithm's pattern and constituent building blocks using an example of a generated pattern

Prairie plant building blocks

Currently I have 45 prairie plant sketches, drawings, and paintings that I have been experimenting with to develop patterns. Here are some selected examples of building blocks that I have been using to generate prairie patterns.
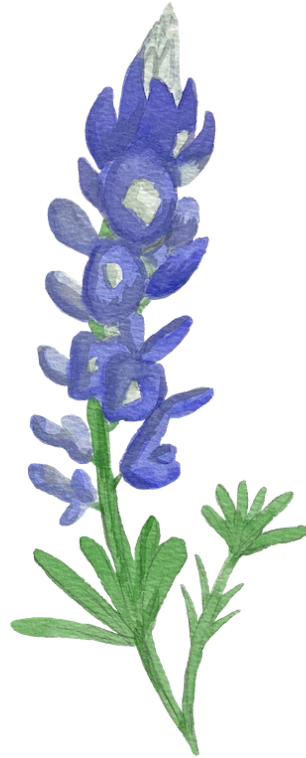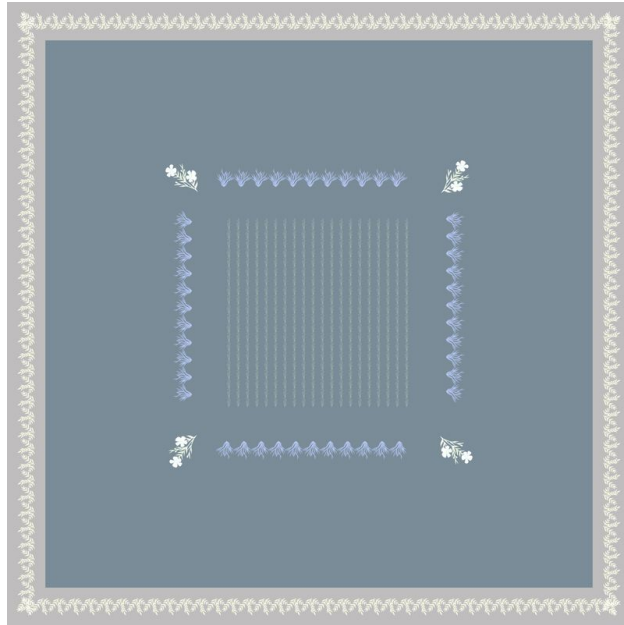
Figure 3
watercolor of bluebonnet flower

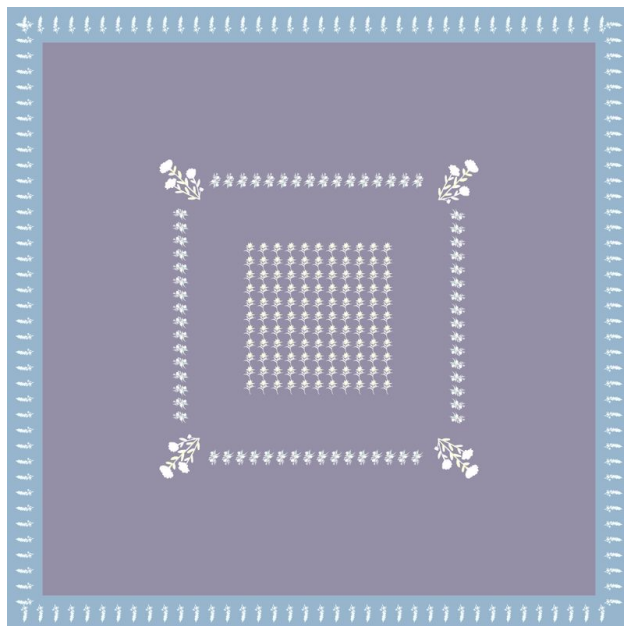**Figure 4**
watercolor of indian paintbrush flower

Figure 5
watercolor of evening primrose flower

Generated "block-printed" prairie patterns

Overall, using the algorithm described above and the plant art building blocks, we can generate some simple textile patterns:
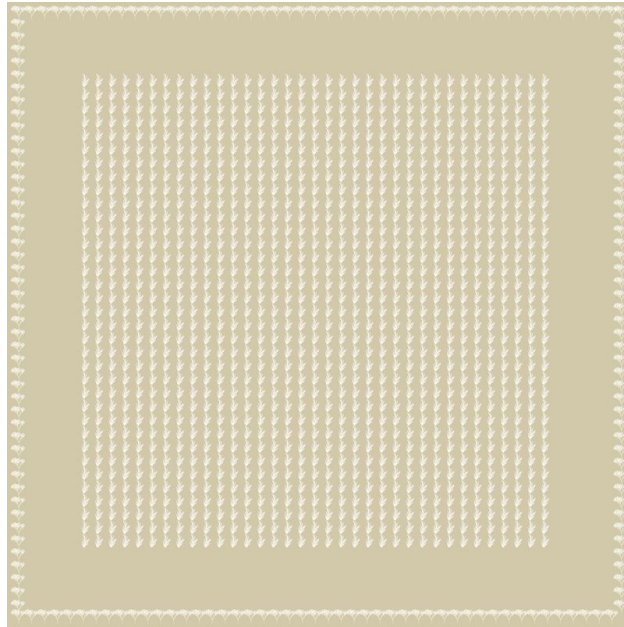
Figure 6
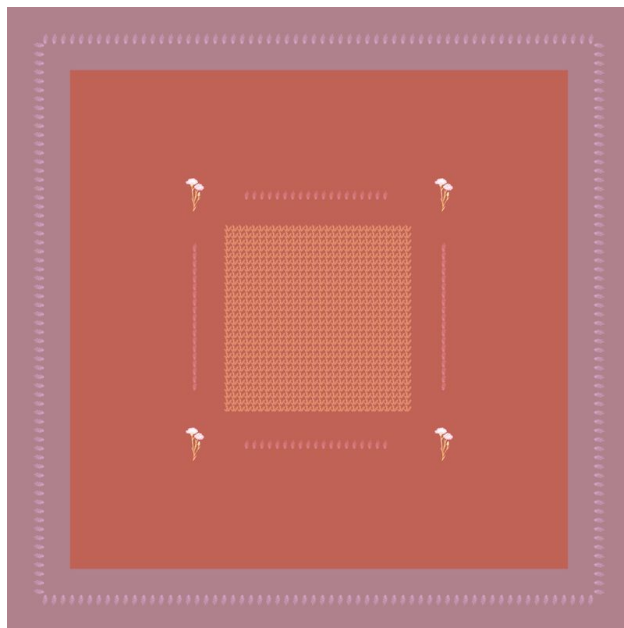*Example of generated prairie pattern*

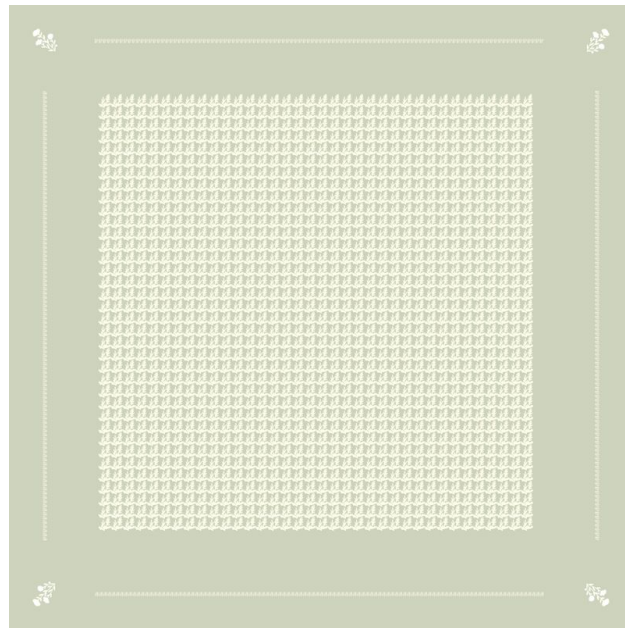**Figure 7**
Example of generated prairie pattern

Figure 8
Example of generated prairie pattern

Figure 9
Example of generated prairie pattern

Figure 10
Example of generated prairie pattern

I also made a [visualization/website](#) to showcase some of the generated patterns :)

Figure 11
Visualization of a generated prairie pattern displayed in front of a simulated grassland prairie
environment

Future Work and Ideas

At the moment, the code/project is still a work in progress and currently renders simple square/symmetric patterns. In the future, I would like to add additional motifs and plants from my observations and alternation patterns based on further studies of traditional textiles. I would also love to expand into making these patterns for other aspect ratios, maybe eventually rendering saris in the form of physical fabrics, digital simulations, or projection mapping live-generated patterns from live-sampled shadows!

Conclusion

Overall, I am still in the process of learning and iterating on the algorithm and am only scratching the surface of possibilities. There are quite a few projects that have much more detailed pattern algorithms such as this tutorial by WOVNS that uses Processing.[9] I am looking forward to experimenting and exploring ways of adapting on these existing ideas as a way of understanding the traditional techniques that have been developed by many before me as well as deepening my understanding and connections to the places and environments I reside in.

References

1. Bogansky, A. E. (2013). Interwoven globe: the worldwide textile trade, 1500-1800 (p. 104). A. Peck (Ed.). New York: Metropolitan Museum of Art. ↵

2. https://museum.gwu.edu/selections-textile-museum-collection ↵

3. Guy, J., Crill, R., & Thakar, K. (2021). Indian Textiles. ↵

4. https://artsandculture.google.com/story/indian-textiles-nature-making-victoria-and-albert-museum/YAUROUQuPAXOJw?hl=en ↵

5. https://craftatlas.co/crafts/bagh-print ↵

6. https://craftatlas.co/crafts/kalamkari ↵

7. https://p5js.org/ ↵

8. https://github.com/vidgi/prairie-kolam ↵

9. https://www.wovns.com/tutorials/designing-computational-textiles-with-processing/ ↵