

gTangle: a Grammar for the Procedural Generation of Tangle Patterns

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Comparison with
Discrete texture design using a programmable approach
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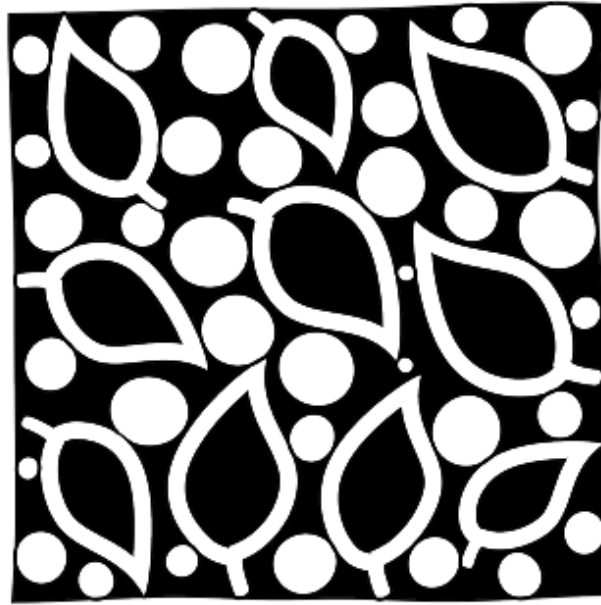


Figure 1: Compared Tangle 01.

Assuming that the leaf and the circle-like shapes are provided as input data:

1. Uniform partition and random-scaling mapper give altogether the leaves distribution.
2. Uniform partition cut out by the leaves (Outside operator) and then scaling mapper give the circles, a final Union gives the final result.

Total : 20-25 lines

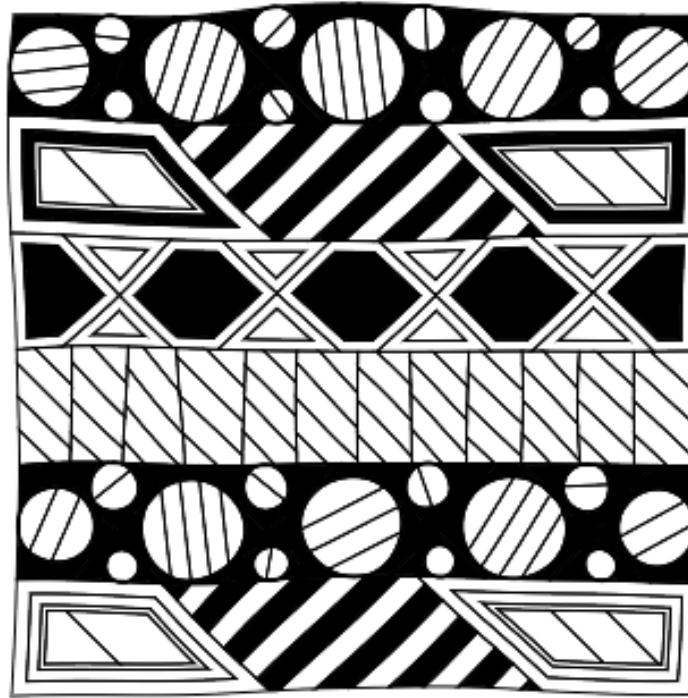


Figure 2: Compared Tangle 02.

Assuming that the circle-like shape is provided:

1. Labeled Stripes partition gives the original horizontal cutting with four kinds of rows
2. First kind (circles):
 - Labeled Stripes partition gives the vertical cutting.
 - In one of the columns, a mapper places the circle and a random-angle Stripes partition fills it.
 - In every other column, a Stripes partition divides the space between the two small circles, and a mapper places a circle (split or not) in each face obtained.
3. Second kind (striped):
 - A Stripes partition separates the trapezes and the striped area
 - The trapezes are generated using a single face-downscaling mapper called several times, and a final random-spacing Stripes partition cuts the smallest trapeze in several parts
 - A single Stripes partition generates the striped area.
4. Third kind (hourglasses):
 - A grid partition gives the shape of the hourglasses
 - A face-downscaling mapper gives the inner parts of hourglasses as well as the spaces between each hourglass
 - A Union gives the overall result
5. Fourth kind (small pieces):
 - A first Stripes partition gives the vertical separation
 - A second one gives the smaller scale cutting
6. A final Union gives the whole texture

Total : 50-60 lines



Figure 3: Compared Tangle 03.

Assuming that circles, "m", "2", "E" and "c" shapes are provided:

1. The arrangements melting big and small circles can be obtained with the same script, whether they are on black or white background:
 - Uniform partition and simple mapper to place large circles
 - Uniform partition, cut out by large circles (Outside operator) and scaling mapper to obtain small circles
 - Union to merge the two
2. The arrangements with circles of roughly same size, arranged more regularly, can be obtained with a single script:
 - Stripes partition that cuts the domain into horizontal slices
 - Random-spacing Stripes partition that cut each slice vertically
 - Mapper that places the circles
3. The checkerboard is a single Labeled Grid partition
4. On top of the "c" texture, this arrangement is a vertical Stripes partition, then a horizontal one, then a face-downscaling mapper
5. The "c", "m", "2" and "E" textures can be obtained with a single script: Uniform partition then random-scaling/random-rotating mapper
6. On the bottom of the "c" texture, this is a Grid texture, each cell being cut by a Stripes partition, each face obtained being downsized with a mapper, the result being cut again with another Stripes partition.

Total : 60-70 lines

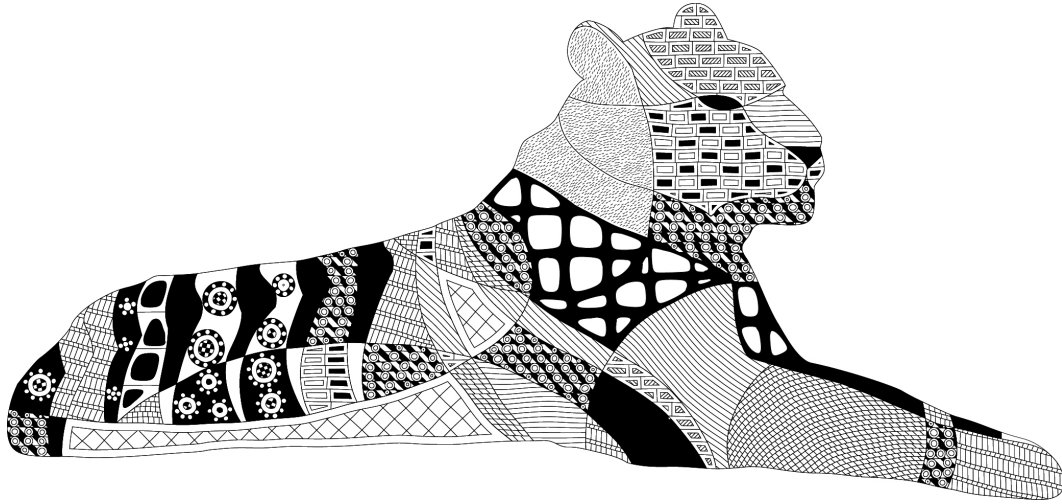


Figure 4: Compared Tangle 04.

Assuming that the circle and the hatches are provided:

1. The "flowers" (concentric circles with circles distributed on their perimeters) can be obtained with a Uniform partition and a heavy custom mapper (probably 20 lines). The checkerboard inside can be obtained with a labeled Grid partition.
2. The leftbottom-most texture can be obtained with a horizontal Stripes partition, then a vertical Stripes partition plus a mapper to obtain the circles, then a diagonal Stripes partition and a Outside operator to obtain the stripes behind.
3. Right from the previous texture, this is a Grid partition.
4. The "bricks" textures can be obtained either with a couple Stripes partition, or three of them.
5. The grids with smooth cells, either black on white background or conversely, can be obtained with a Grid partition and a custom mapper (probably 10 lines)
6. The hatching textures can be obtained with a Uniform partition and a mapper

Total : 70-80 lines