

N = 12

EXHIBITION CATALOG

Featuring artists Anna Lucia, Nadieh Bremer, Daniel Catt, Reva Fan, Elsif, Lia Coleman, Piter Pasma, RalenArc, Bart Simons, Nicole Vella, ippsketch, and Melissa Wiederrecht. Curated by Aaron Penne.

CONTENTS

Curator's note

4-5

Process work

6-47

Artwork outcomes

48-53

2

3

4

N=12 is an experiment in building intentional community, with 12 artists collaborating across seven time zones. Contemporary computer-based artists create their work while connected to an effectively infinite network of information. This affords artists the capacity for infinite input and collaboration, leaving them to distill these disparate connections and experiences into their artwork. Distinctly, the computer artist's principal tool for creation is also a means for connection. This exhibition leans into the inherent proximity of computer users by explicitly asking 12 artists to create work while in constant dialogue with one another. In doing so, the show makes audible the "wonderfully silent conversations" between artists that Frieder Nake referred to in his foreword to Casey Reas' "**CENTURY**" catalog of 2012.

For **N=12**, the artists had direct and active conversations with each other. **Anna Lucia, Nadieh Bremer, Daniel Catt, Reva Fan, Elsif, Lia Coleman, Piter Pasma, RalenArc, Bart Simons, Nicole Vella, ippsketch**, and **Melissa Wiederrecht** convened and collaborated online over several months, sharing their code and artistic processes while fostering a co-creative microcosm enriched by weekly meetings, aesthetic critiques, code reviews, and vibrant discussion. In doing so, they generated work with a dozen distinct fingerprints.

5

The participants in this exhibition were selected through a democratic process from **The Generative Artists Club (genartclub)**, a behind-the-scenes group of over 500 generative artists founded in 2018. This group has become a nexus for artists working with systems to discuss works in progress, debug code, share mental health journeys, and connect with other creators from around the world that share their passion for generative art. This group is just one example of artists aggregating their collective efforts; many well-known groups throughout history such as the Batignolles Group (1870s), the Dadaists (1910s), and Fluxus (1960s) have seen artists collaborate to push their respective mediums forward. Unique to digital art, the mediums through which these artists interact are the same mediums through which artworks are created, completed, and distributed. By creating an environment for this sort of organic exchange of ideas, **N=12** can serve as the basis for future groups to experiment.

Collaborative creation — from a place of trust and vulnerability — spurs new aesthetic directions, strengthening both the work and the relationships. For example, Elsif initially pursued a composition of mountains in pointillist style. During group discussion around black and white outputs she drifted towards a more visceral aesthetic and shifted the entire work to monochrome, then in reaction to that starkness reintroduced color and found a new impressionistic sense of subject and texture. The idea of collaboration itself influenced multiple artists: Reva Fan's intersecting collisions, ippsketch's 12 interconnected shapes, Anna Lucia's woven

textures, Piter Pasma's groupings, Nadieh Bremer's overlapping lines, Nicole Vella's clinging forms.

As Lia Coleman, who created the work "Emergence" for the show, put it: "You put in fragments of an idea... something unexpected always comes out of the machine, and you try to piece it all together."

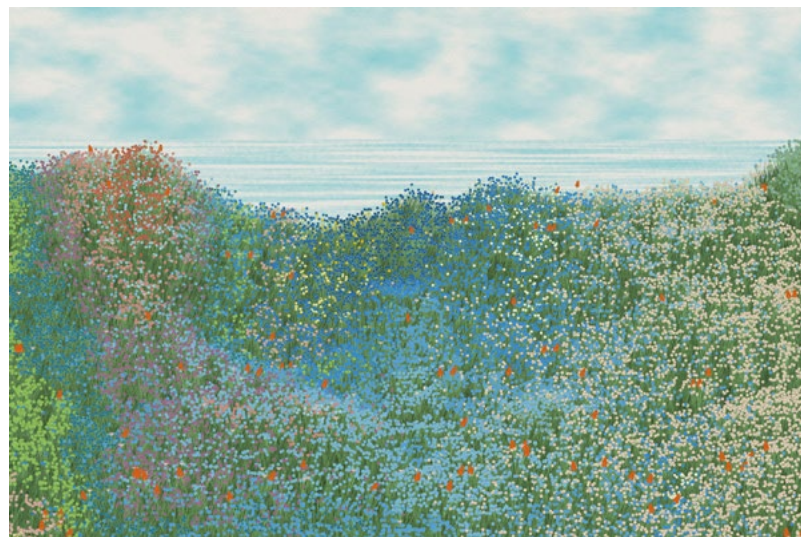
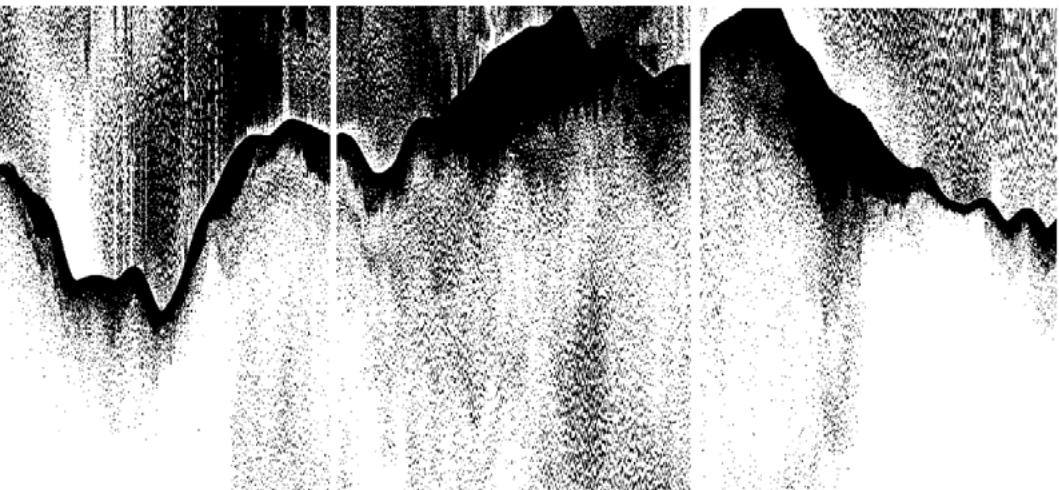
This cross-pollination of ideas pushed each of the artists towards new technical and aesthetic innovations. Each of their works is created with code written by the artists themselves. This has required artists to be equally comfortable *ideating* with infinite imagination and instructing a machine to translate these ideas into reality. The **Experiments in Art and Technology (E.A.T.)** of the 1960s normalized the collaboration of artists and engineers. In contrast, the artists of this show — indeed, much of this generation — are themselves all hybrid artist-engineers. Not only do they critique each other's aesthetics, they also debug each other's code. In such a context, variables, functions, and logic are as open to influence as color palette. These artists are not just sharing outputs with each other, they are sharing their innermost processes.

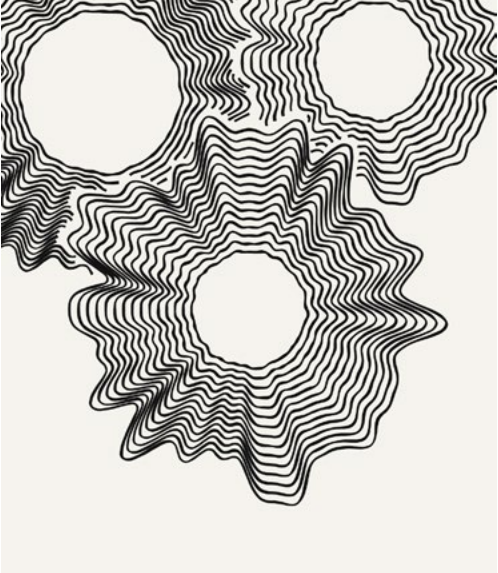
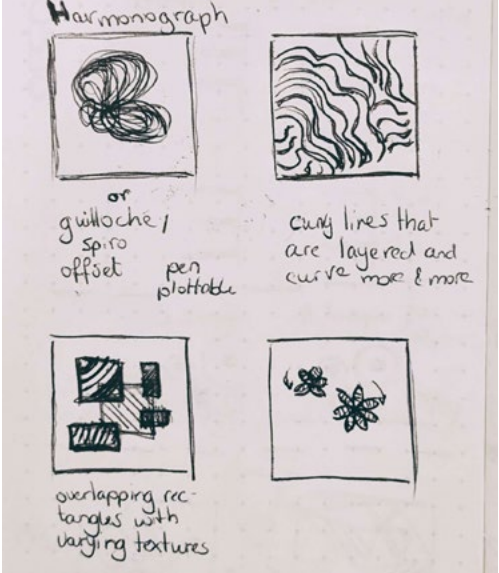
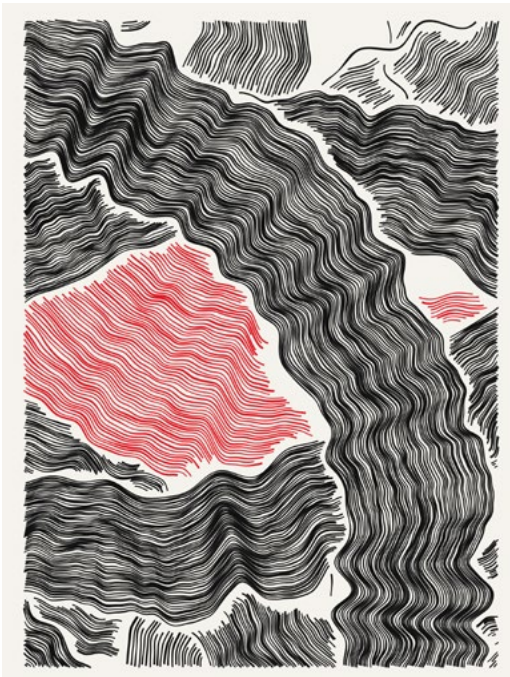
When viewing the resulting artworks, only the final output of the story is revealed, obfuscating the alchemical process of each of the artists. **N=12** is a testament to the power of collaboration throughout a networked world that enables individuals to create something more than they could conceive individually.

6

7

Reva Fan
“Many generative artists feel they create their own work independently but actually we are creating in a space of collective intelligence on the internet.”





Bart Simons
 "My project is mine, but because it's been influenced
 by 11 others I feel that it's a little bit partly everyone's
 project as well"

```

1182 if((COLOR_STYLE === 4 || COLOR_STYLE === 5 || COLOR_STYLE === 6) && i === 0) PR
1183
1184 let n_rings = PROB_ONE_RING ? 1 : rangeFloor(scale_ring_min(R/DEFAULT_WIDTH), s
1185
1186 // let order = d3.range(N_CIRCLES)
1187 // TODO: Flip some of the orders (but then also flip that order for the other c
1188
1189 let COL = COLOR_STYLE === 1 && i === COLOR_INDEX ? COLOR_BASE : null
1190
1191 CIRCLES.push(
1192   new WAVY_CIRCLE({
1193     x: PDS_points[i][0],
1194     y: PDS_points[i][1],
1195     r: R,
1196     index: i,
1197     rings: n_rings,
1198     // order: order, // Not used now
1199     color: COL
1200   })
1201 )
1202 }//for i
1203

```

```

1182 if((COLOR_STYLE === 4 || COLOR_STYLE === 5 || COLOR_STYLE === 6) && i === 0) PR
1183
1184 let n_rings = PROB_ONE_RING ? 1 : rangeFloor(scale_ring_min(R/DEFAULT_WIDTH), s
1185
1186 // let order = d3.range(N_CIRCLES)
1187 // TODO: Flip some of the orders (but then also flip that order for the other c
1188
1189 let COL = COLOR_STYLE === 1 && i === COLOR_INDEX ? COLOR_BASE : null
1190
1191 CIRCLES.push(
1192   new WAVY_CIRCLE({
1193     x: PDS_points[i][0],
1194     y: PDS_points[i][1],
1195     r: R,
1196     index: i,
1197     rings: n_rings,
1198     // order: order, // Not used now
1199     color: COL
1200   })
1201 )
1202 }//for i
1203
1204 // Create each of the black rings per circle
1205 CIRCLES.forEach(circle, i) => {
1206   circle.initialCircleOffset()
1207   for(let i = 1; i < circle.n_rings; i++) {
1208     circle.offsetPath(i)
1209   }
1210   circle.saveFinalPath()
1211   console.log('Circle ' + (i+1) + ' of ' + (N_CIRCLES) + ' done')
1212 }
1213
1214 ///////////////////////////////////////////////////
1215 /////////////////////////////////////////////////// Return Sketch ///////////////////////////////////////////////////
1216 ///////////////////////////////////////////////////
1217
1218 return (context, WIDTH, HEIGHT) => {
1219
1220   PRNG = new RND(hash)
1221
1222   ///////////////////////////////////////////////////
1223   /////////////////////////////////////////////////// Draw the Visual ///////////////////////////////////////////////////
1224   ///////////////////////////////////////////////////
1225
1226   // Draw the background
1227   context.fillStyle = COLOR_BACKGROUND
1228   context.fillRect(0, 0, WIDTH, HEIGHT)
1229
1230   // // TEST - Draw the radius of the circles
1231   // CIRCLES.forEach(circle => {
1232   //   context.beginPath()
1233   //   context.arc(circle.x + SF, circle.y + SF, circle.r + SF, 0, TAU)
1234   //   context.strokeStyle = circle.color ? circle.color : COLOR_BLACK
1235   //   context.stroke()
1236 // }

```

```

Circle 2 of 8 done
Circle 3 of 8 done
Circle 4 of 8 done
Circle 5 of 8 done
Circle 6 of 8 done
Circle 7 of 8 done
Circle 8 of 8 done

```

```

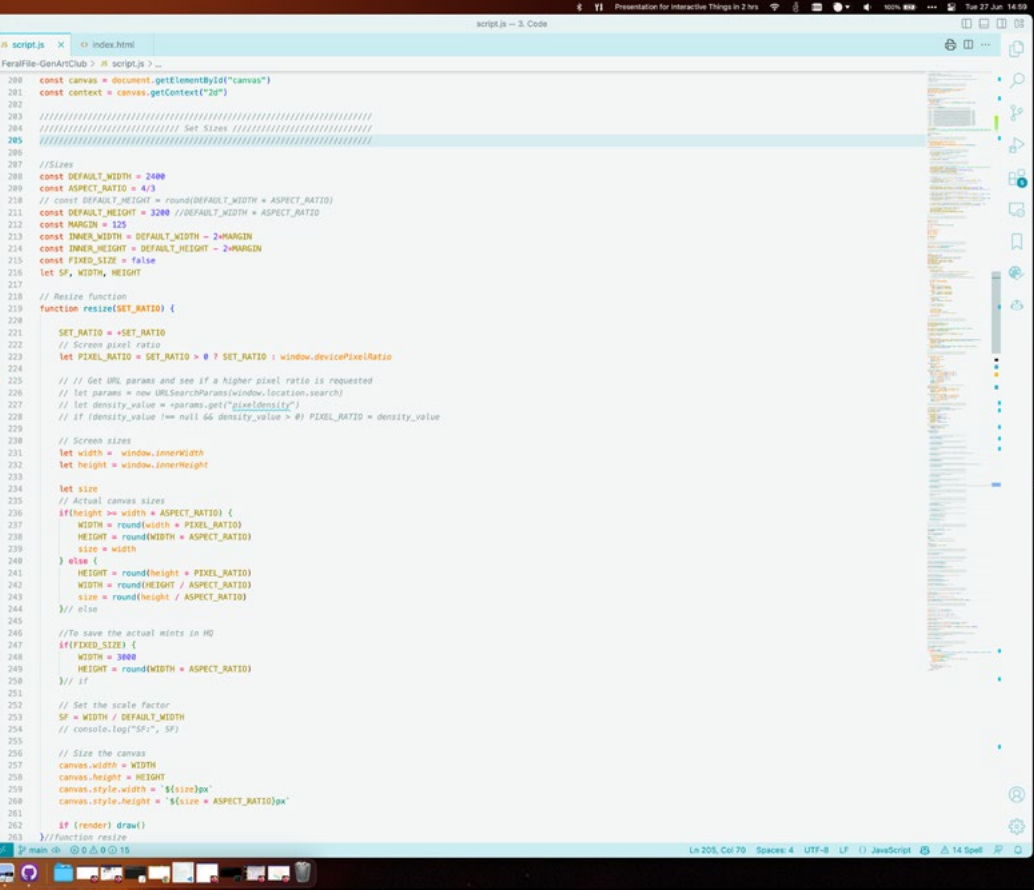
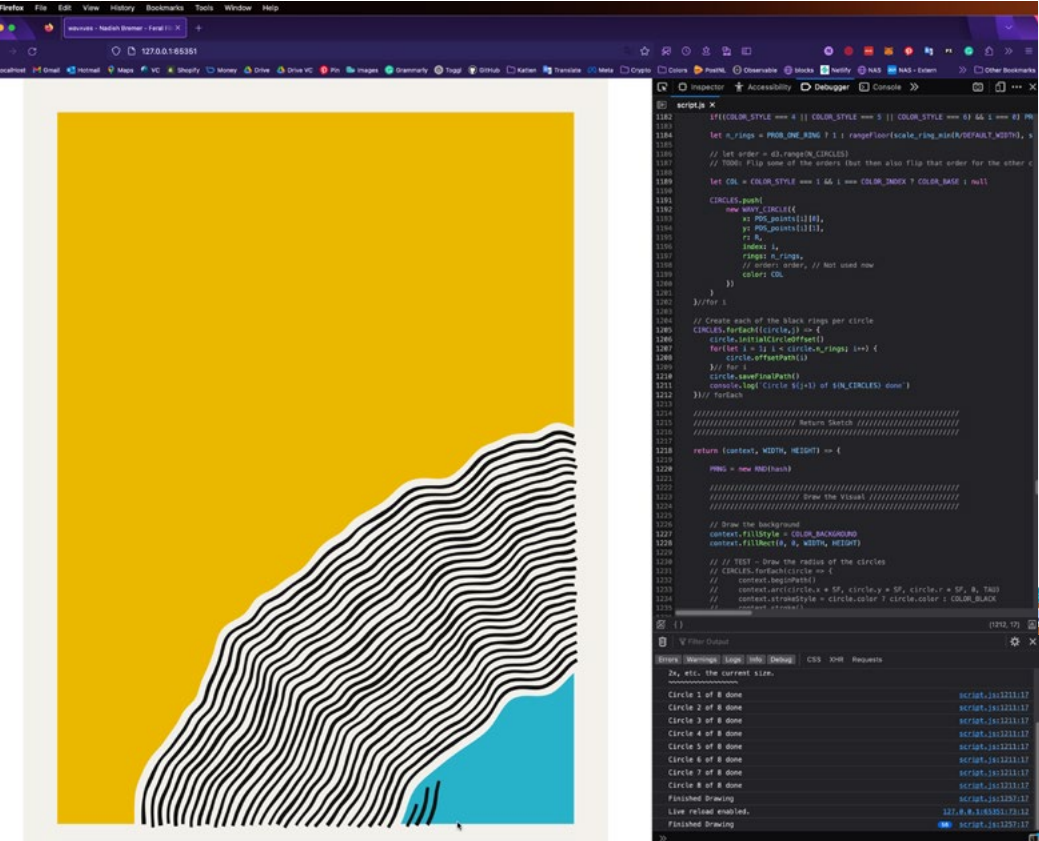
////////////////////////////////////
//////////////////////////////////// Return Sketch ///////////////////////////////////
////////////////////////////////////

return (context, WIDTH, HEIGHT) => {

  PRNG = new RND(hash)

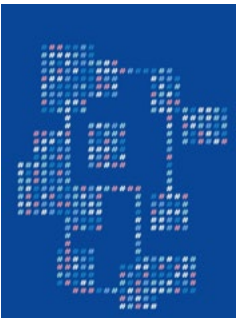
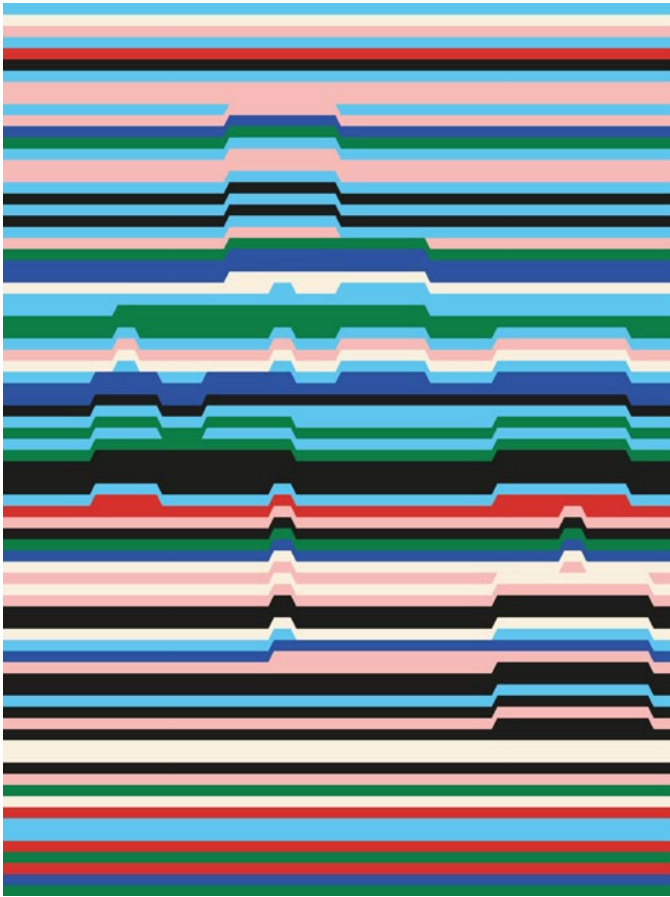
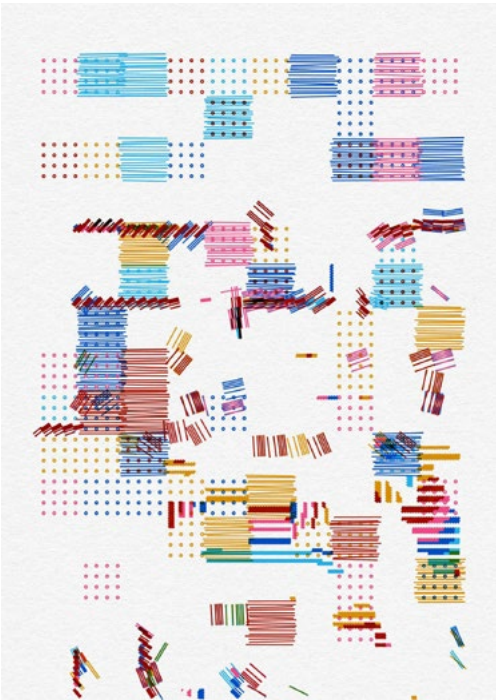
  ///////////////////////////////////
  /////////////////////////////////// Draw the Visual

```

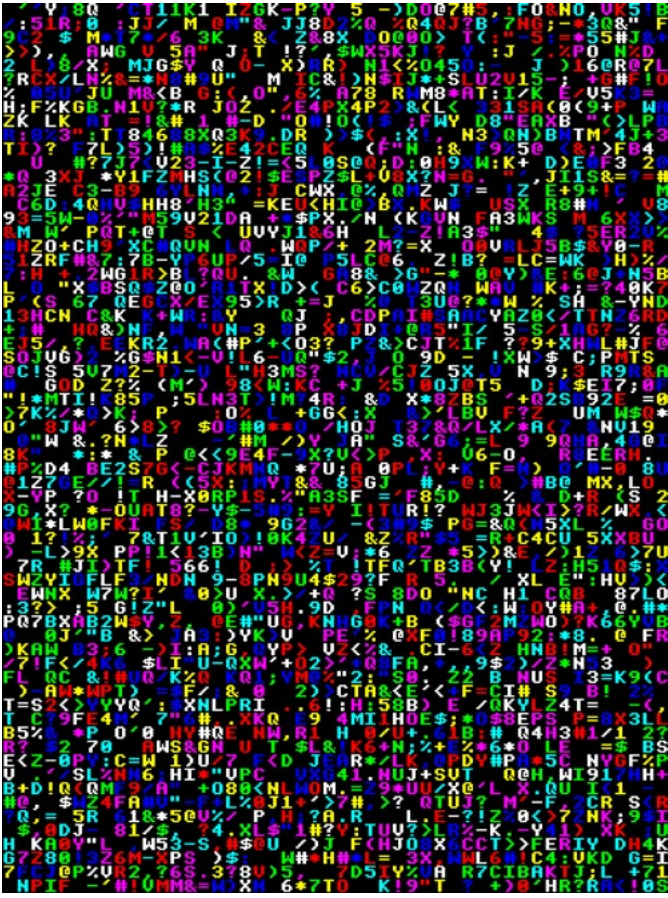


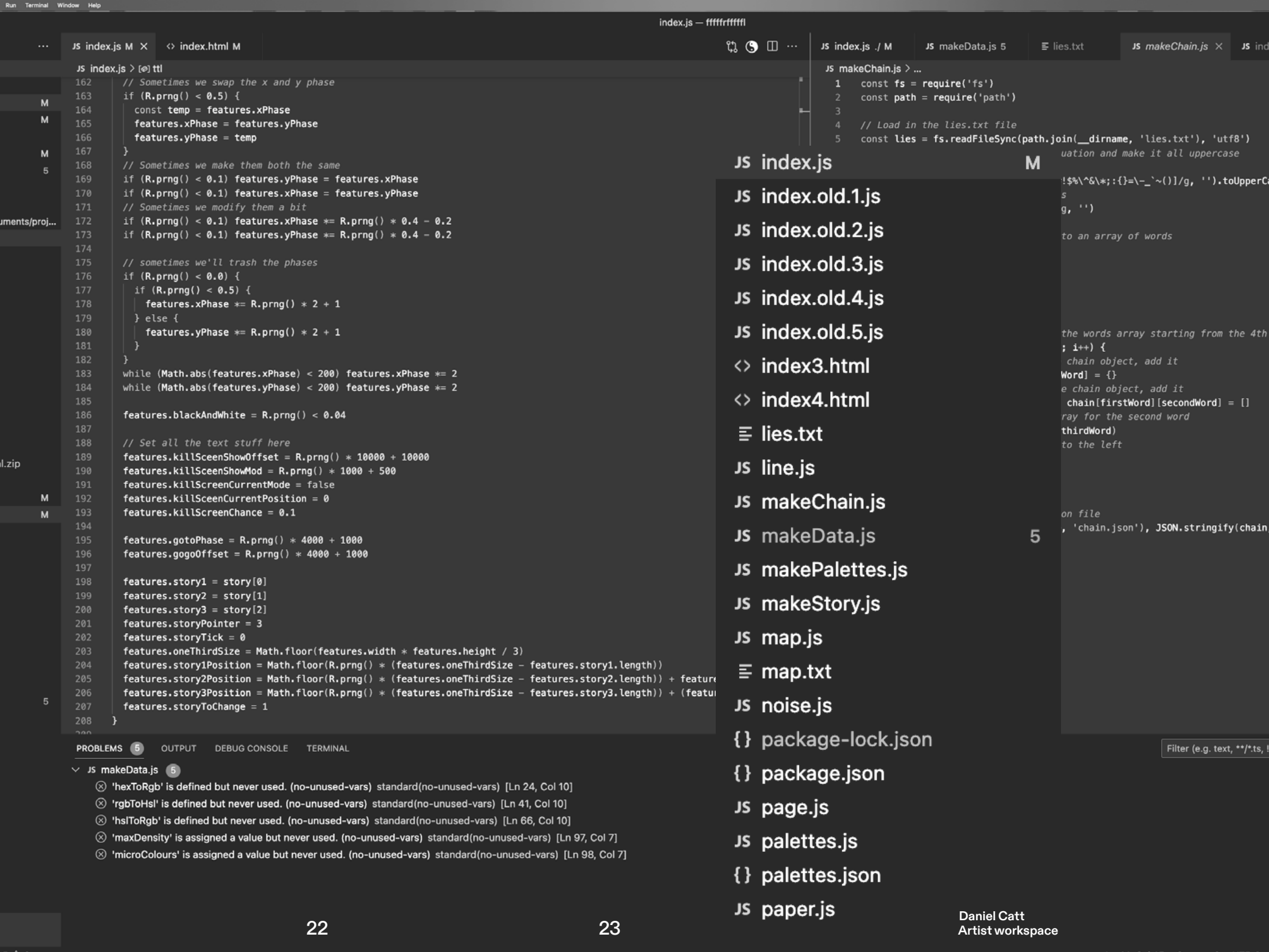
Bart Simons
"I see certain influences in my artwork that I can relate back to conversations I've had with people in this group, things I wouldn't have tried without them."





Nadieh Bremer
"You're not in your usual 'alone bubble,' now there's
11 other people in your bubble that really make the
work much better than if it was just you alone"





```
JS index.js > [0] ttl
162 // Sometimes we swap the x and y phase
163 if (R.prng() < 0.5) {
164   const temp = features.xPhase
165   features.xPhase = features.yPhase
166   features.yPhase = temp
167 }
168 // Sometimes we make them both the same
169 if (R.prng() < 0.1) features.yPhase = features.xPhase
170 if (R.prng() < 0.1) features.xPhase = features.yPhase
171 // Sometimes we modify them a bit
172 if (R.prng() < 0.1) features.xPhase *= R.prng() * 0.4 - 0.2
173 if (R.prng() < 0.1) features.yPhase *= R.prng() * 0.4 - 0.2
174
175 // sometimes we'll trash the phases
176 if (R.prng() < 0.0) {
177   if (R.prng() < 0.5) {
178     features.xPhase *= R.prng() * 2 + 1
179   } else {
180     features.yPhase *= R.prng() * 2 + 1
181   }
182 }
183 while (Math.abs(features.xPhase) < 200) features.xPhase *= 2
184 while (Math.abs(features.yPhase) < 200) features.yPhase *= 2
185
186 features.blackAndWhite = R.prng() < 0.04
187
188 // Set all the text stuff here
189 features.killScreenShowOffset = R.prng() * 10000 + 10000
190 features.killScreenShowMod = R.prng() * 1000 + 500
191 features.killScreenCurrentMode = false
192 features.killScreenCurrentPosition = 0
193 features.killScreenChance = 0.1
194
195 features.gotoPhase = R.prng() * 4000 + 1000
196 features.gogoOffset = R.prng() * 4000 + 1000
197
198 features.story1 = story[0]
199 features.story2 = story[1]
200 features.story3 = story[2]
201 features.storyPointer = 3
202 features.storyTick = 0
203 features.oneThirdSize = Math.floor(features.width * features.height / 3)
204 features.story1Position = Math.floor(R.prng() * (features.oneThirdSize - features.story1.length))
205 features.story2Position = Math.floor(R.prng() * (features.oneThirdSize - features.story2.length)) + features
206 features.story3Position = Math.floor(R.prng() * (features.oneThirdSize - features.story3.length)) + (featur
207 features.storyToChange = 1
208 }
209
```

```
JS makeChain.js > ...
1 const fs = require('fs')
2 const path = require('path')
3
4 // Load in the lies.txt file
5 const lies = fs.readFileSync(path.join(__dirname, 'lies.txt'), 'utf8')
   uation and make it all uppercase
```

JS index.js

M

JS index.old.1.js

JS index.old.2.js

JS index.old.3.js

JS index.old.4.js

JS index.old.5.js

<> index3.html

<> index4.html

≡ lies.txt

JS line.js

JS makeChain.js

JS makeData.js

5

JS makePalettes.js

JS makeStory.js

JS map.js

≡ map.txt

JS noise.js

{ } package-lock.json

{ } package.json

JS page.js

JS palettes.js

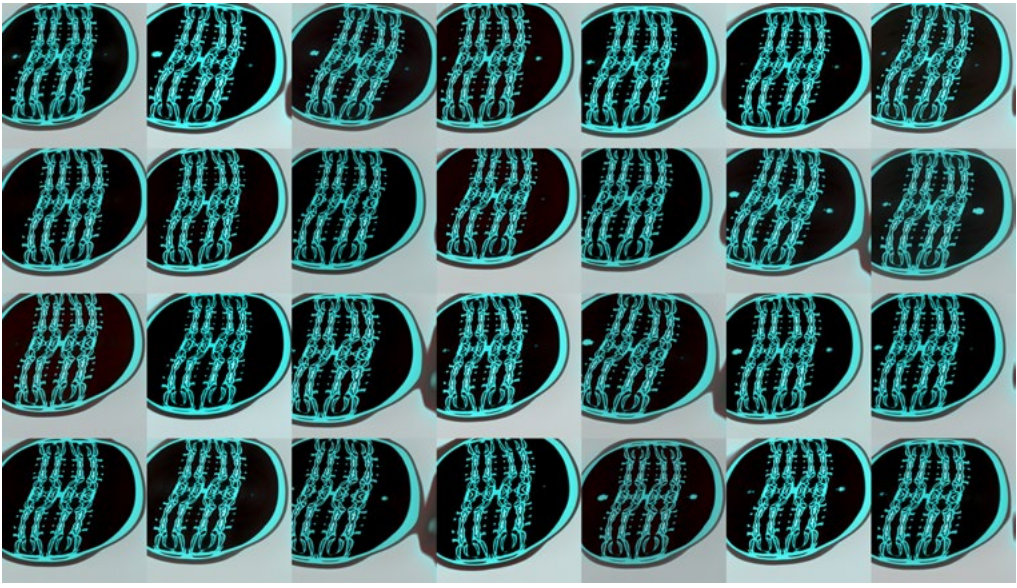
{ } palettes.json

JS paper.js

```
!$%^&\*;:{}=\_`~()]/g, '').toUpperCase()
s
g, '')
to an array of words
the words array starting from the 4th
; i++) {
  chain object, add it
Word] = {}
e chain object, add it
  chain[firstWord][secondWord] = []
ray for the second word
thirdWord)
to the left
```

```
on file
, 'chain.json'), JSON.stringify(chain
```

- JS makeData.js 5
 - ⊗ 'hexToRgb' is defined but never used. (no-unused-vars) standard(no-unused-vars) [Ln 24, Col 10]
 - ⊗ 'rgbToHsl' is defined but never used. (no-unused-vars) standard(no-unused-vars) [Ln 41, Col 10]
 - ⊗ 'hslToRgb' is defined but never used. (no-unused-vars) standard(no-unused-vars) [Ln 66, Col 10]
 - ⊗ 'maxDensity' is assigned a value but never used. (no-unused-vars) standard(no-unused-vars) [Ln 97, Col 7]
 - ⊗ 'microColours' is assigned a value but never used. (no-unused-vars) standard(no-unused-vars) [Ln 98, Col 7]



```

lia_gen_vids.py --stylegan3 [SSH: gogh]
lia_post_process.py U artwork_0.mp4 U
gen_vids.py
num_seeds = 3 #10
seeds_list = [random.randint(0, 500) for i in range(num_seeds)]
seeds_list.append(seeds_list[0])
print("out 1): (str(seeds_list))")
seeds_str = str(seeds_list)[1:-1].replace(" ", "")
seeds = seeds_str

psi = random.choice([0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0])
# psi = random.choice([0.1, 0.12, 0.15, 0.17, 0.2, 0.25, 0.27, 0.3])

# just seeds:
outfname = f"lerp1_{networkname[:4]}_seedsrand(num_seeds)_psi{psi}"
cmd = f"python gen_video.py --network={network} --seeds={seeds} --"
os.system(cmd)

```

Daniel Catt

“Because we are all together, you kind of have the protection of not being the center of attention, and that’s when I came to the realization that I could try something different. I could try to push in a different direction that isn’t my typical style but is something I have lived with for a long time and really love. I’ve come up with something that is probably not what people normally associate with me. It’s an animated piece, it’s not solid slabs of color for print, it’s certainly not for pen plotters. That’s the bit that I really enjoyed about working within the group.”

```

import os
import argparse
import random

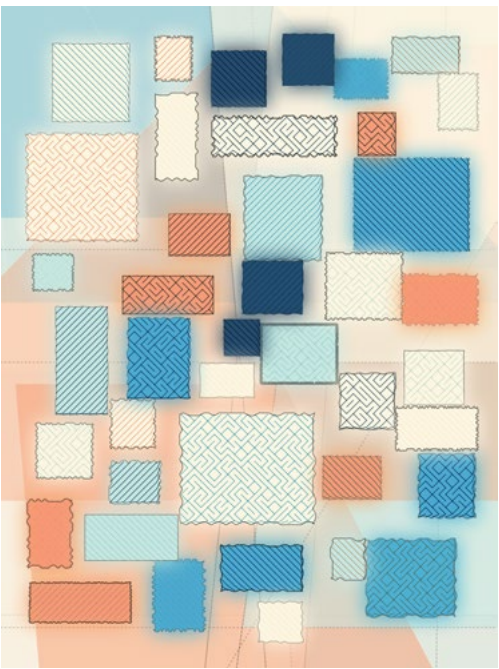
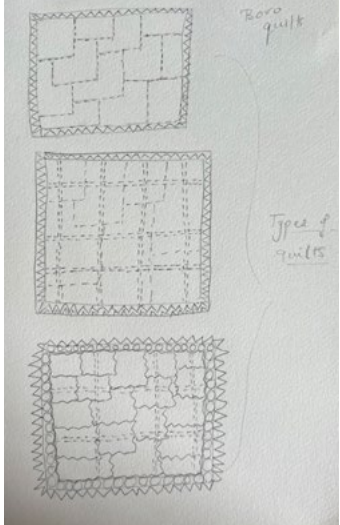
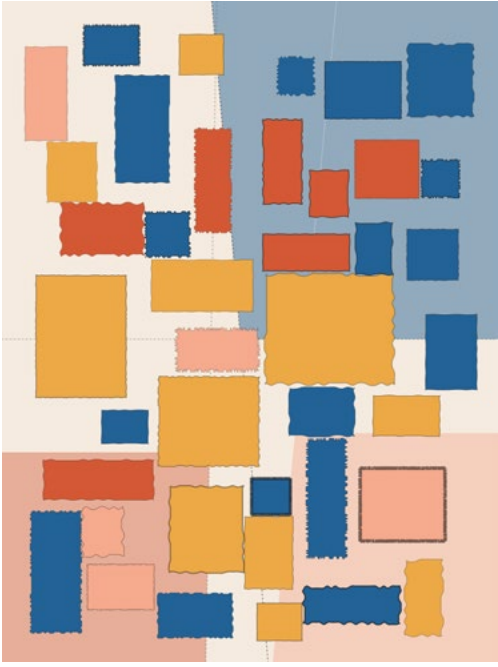
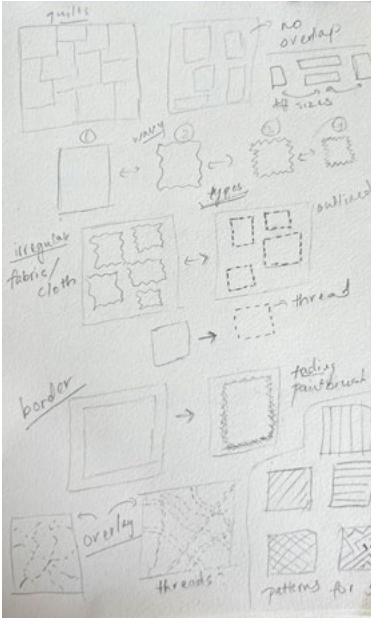
# parser
parser = argparse.ArgumentParser()
parser.add_argument('--network', type=str, required=True)
parser.add_argument('--seeds', type=str, required=True)
parser.add_argument('--psi', type=float, required=True)

args = parser.parse_args()

network = args.network
seeds = args.seeds
psi = args.psi

# just seeds:
outfname = f"lerp1_{networkname[:4]}_seedsrand(num_seeds)_psi{psi}"
cmd = f"python gen_video.py --network={network} --seeds={seeds} --"
os.system(cmd)

```

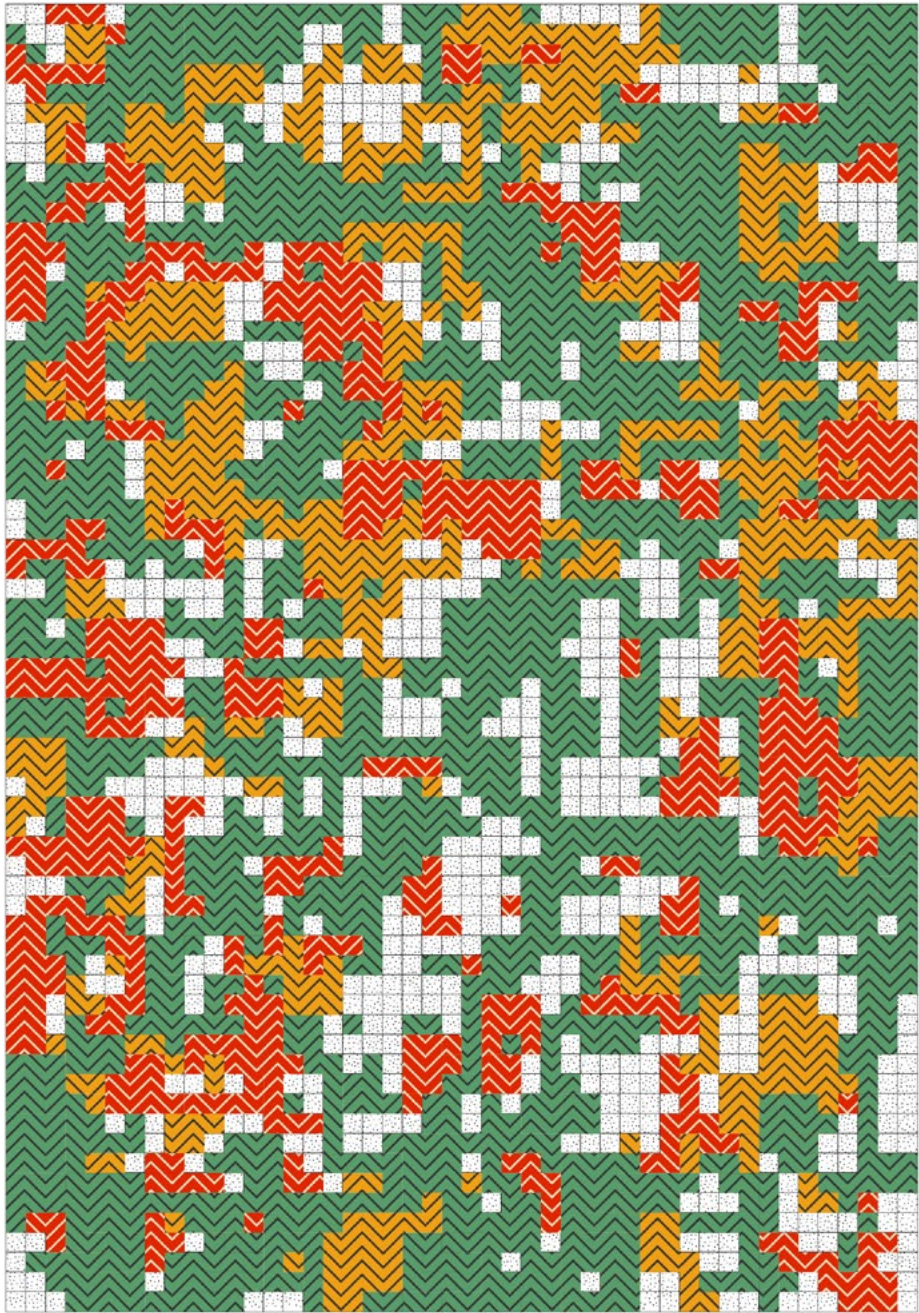
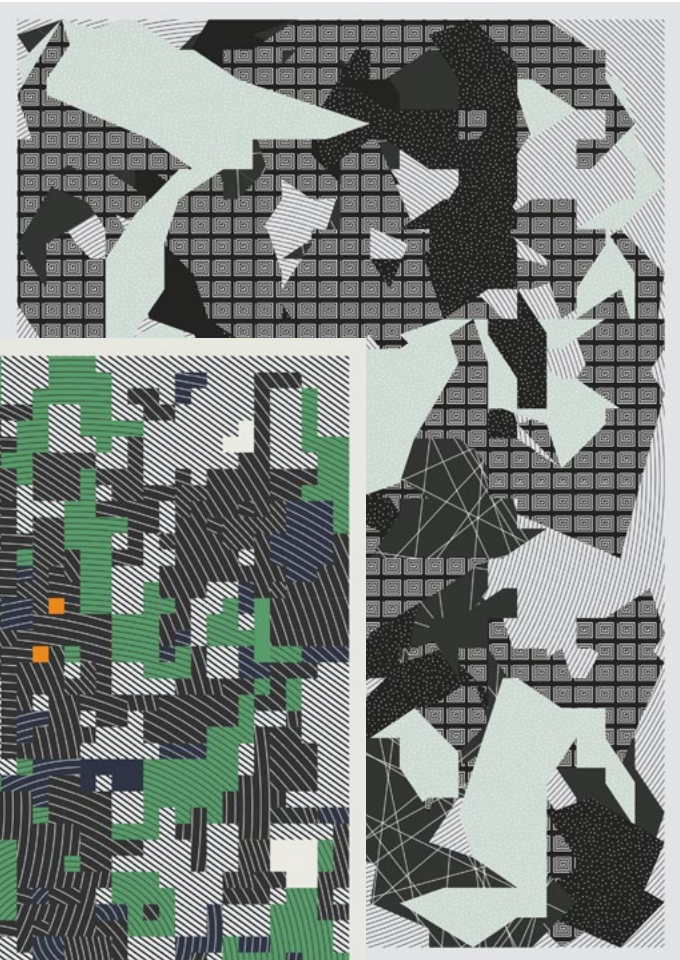
```
277     0 + R.r_n(qOffMax, qOffRightMin),
278     rectangles[j].w - R.r_n(qOffMax, qOffRightMin),
279     0 + R.r_n(qOffMax, qOffRightMin),
280     rectangles[j].w - R.r_n(qOffMax, qOffRightMin),
281     rectangles[j].h - R.r_n(qOffMax, qOffRightMin),
282     0 + R.r_n(qOffMax, qOffRightMin),
283     rectangles[j].h - R.r_n(qOffMax, qOffRightMin)
284 );
285 rctG.drawingContext.clip();
286 drawDiagonalLines(
287     0,
288     0,
289     rectangles[j].w,
290     rectangles[j].h,
291     10 * mult,
292     rctG
293 );
294 rctG.pop();
295 } else {
296     qOffRightMin = 0;
297     qOffMax = 0;
298     makeWobblyRect(
299         rectangles[j].w / 2,
300         rectangles[j].h / 2,
301         rectangles[j].w,
302         rectangles[j].h,
303         rctG
304     );
305     drawDiagonalLines(
306         0,
307         0,
308         rectangles[j].w,
309         rectangles[j].h,
310         10 * mult,
311         rctG
312     );
313 }
314 rctG.push();
```

Ln 290, Col 25 Spaces: 2 UTF-8 LF {} JavaScript Port : 5500 ✓ Prettier

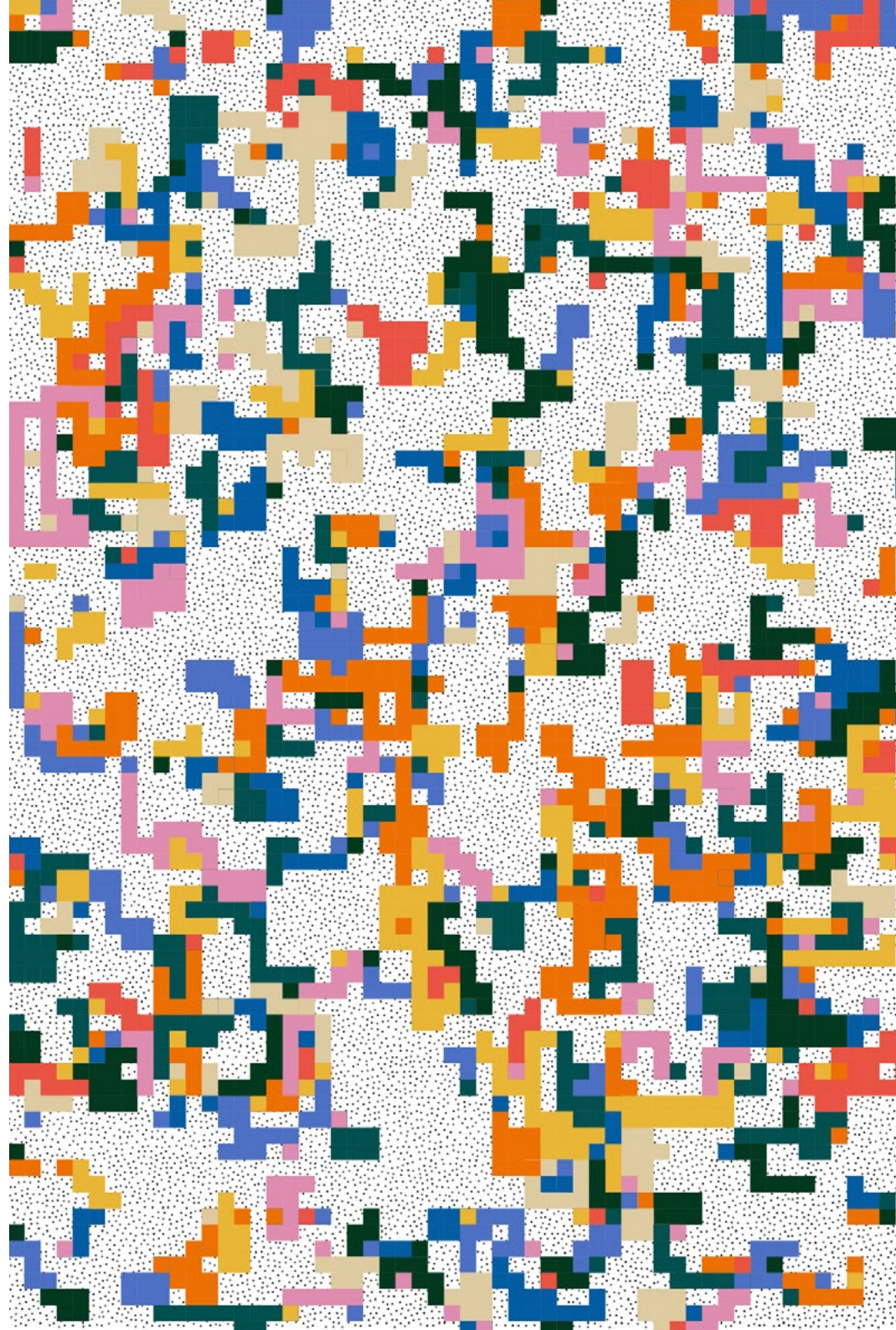


Nadieh Bremer

“This happened during one of our weekly meetings. You can have these blinders on, like this is what I’m going for, and then somebody else tells you ‘actually you should investigate this more’ and it’s like yeah, you’re right, I should investigate this more.”

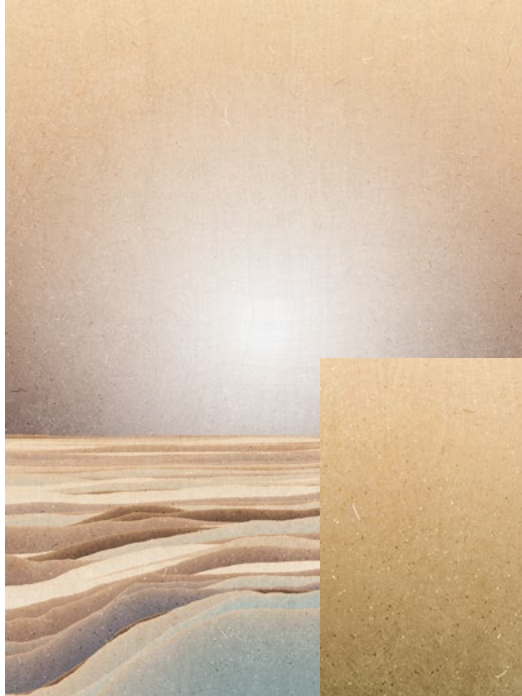


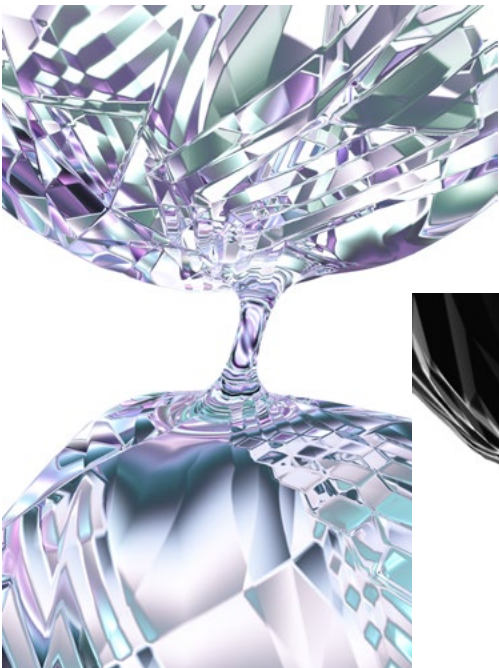
Bart Simons
"It was Nadieh who said I should try adding shadows with a certain method, I was trying to add a little bit more depth and diversity to my outputs. I messed up trying to do what she suggested and I posted those screenshots saying 'I don't know if this works,' it had gotten very messy, then Melissa replied almost immediately 'No, this one is awesome you should go down this route,' so I was encouraged to dive into that bug and now it's a big part of my project and I love it."



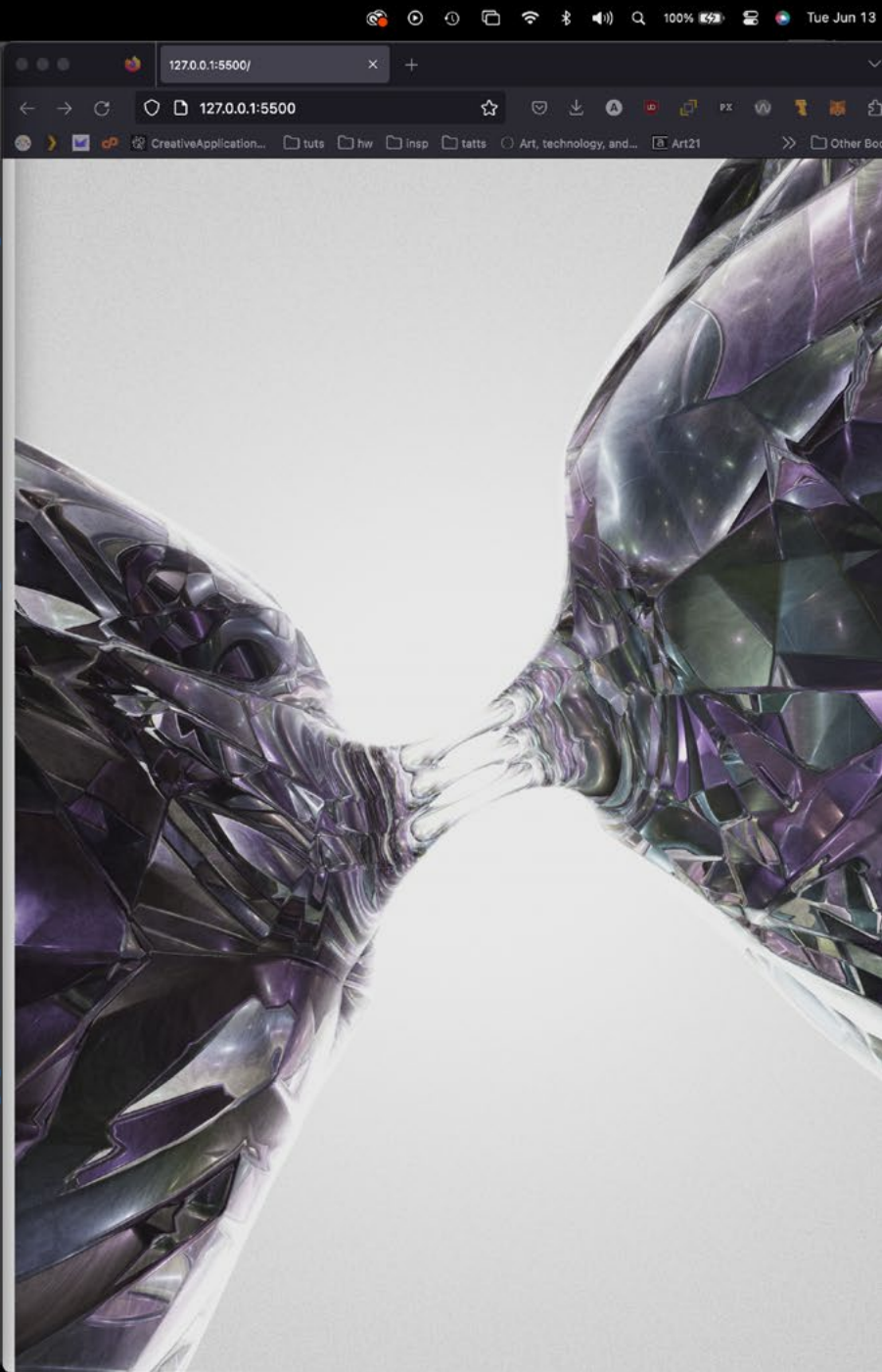


Reva Fan
“When I first got to know the theme of the show [the influence of 12 artists working together] I first thought of the phenomenon of wave interference. I wanted to make circles that have interaction with each other, I wanted to make a study about intersection.”

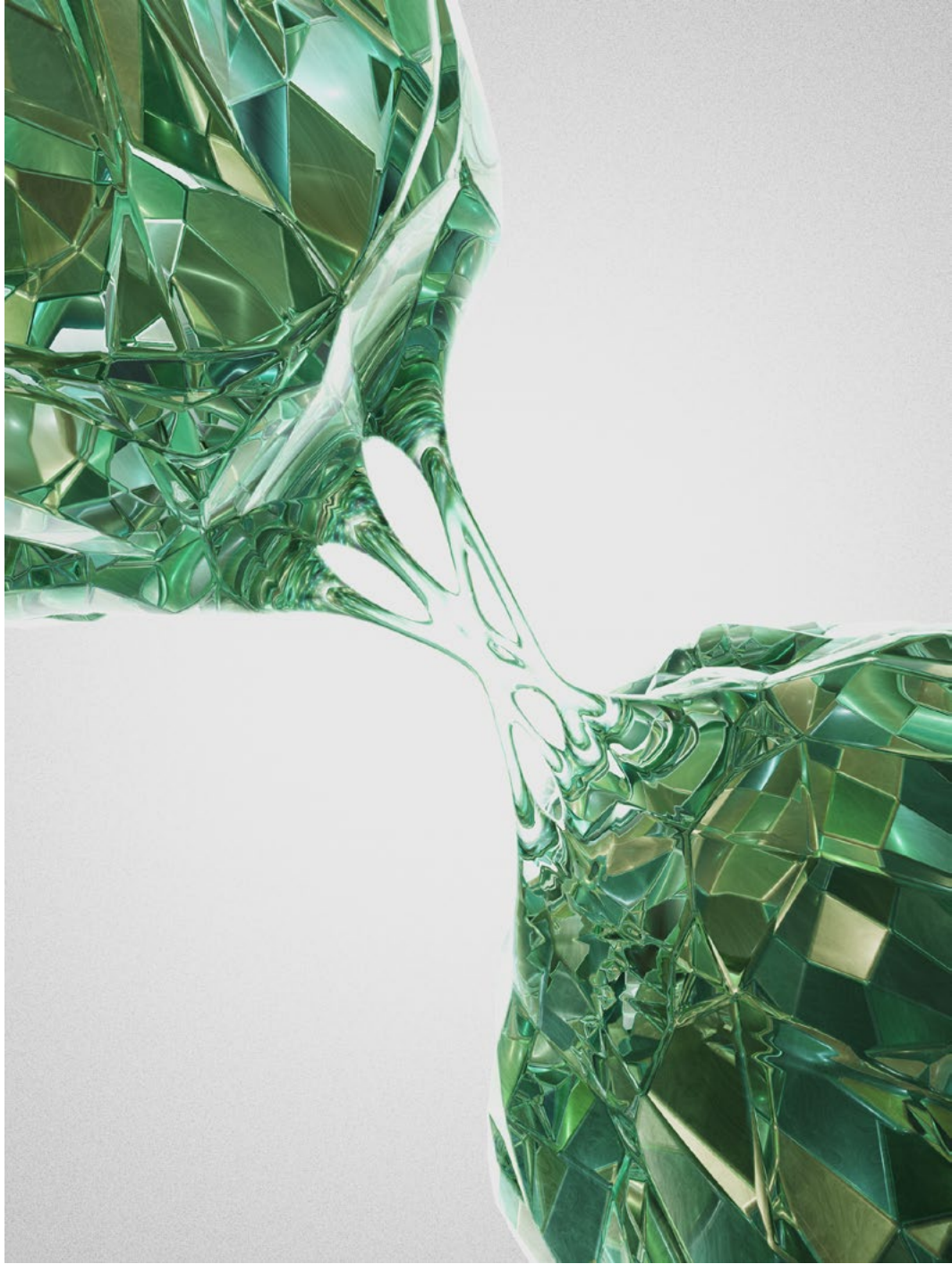




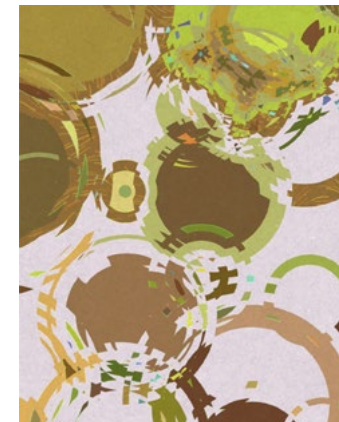
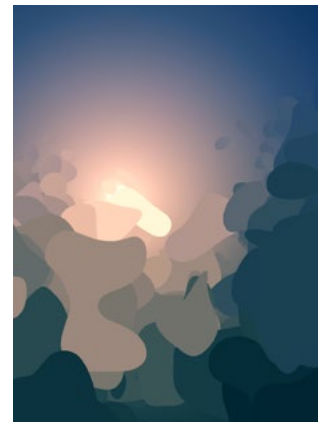
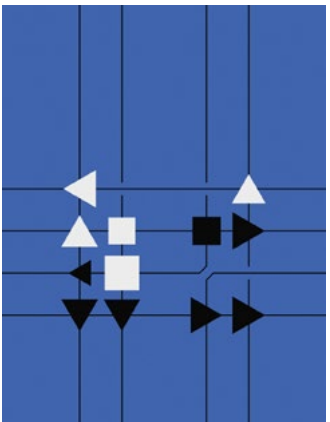
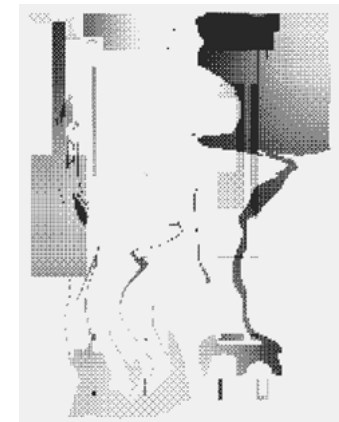
```
Code File Edit Selection View Go Run Terminal Window Help
script.js
J5 script.js x
Users > nicolevella > Desktop > J5 script.js > ...
147 #define PI 3.14159265359
148 #define FT ${R.i(8,16)}
149 #define FB ${R.i(8,16)}
150 #define P(t,a,b,c,d)a+b*cos(PI*2.*(c*t+d))
151 #define F float
152 #define X vec2
153 #define Y vec3
154 #define Z vec4
155 #define BW ${R.b(0.95)}
156
157 F Hash21(X p) {
158   p = fract(p*X(${R.d()*123.34+123.34}, ${R.d()*456.21+456.21}));
159   p += dot(p, p*${R.d()*45.32+45.32});
160   return fract(p.x*p.y);
161 }
162
163 mat2 Rot(F a) {
164   return mat2(cos(a), -sin(a), sin(a), cos(a));
165 }
166
167 F Smin( F a, F b, F k ) {
168   F h = max( k-abs(a-b), 0.0 )/k;
169   F res = min( a, b ) - h*h*k*(1.0/4.0);
170   return res;
171 }
172
173 Z toLinear(Z sRGB) {
174   bvec4 co = lessThan(sRGB, Z(0.04045));
175   Z hi = pow((sRGB + Z(0.055))/Z(1.055), Z(2.4));
176   Z lo = sRGB/Z(12.92);
177   return mix(hi, lo, co);
178 }
179
180 F TorusFold(Y p, X t) {
181   for (int i = 0; i < FT; i++) {
182     p.xz *= Rot(${R.d()} * 3 + 2);
183     p.xy *= Rot(${R.d()} * 3 + 1);
184     p.yz *= Rot(${R.d()} * 2 + 3);
185     p=abs(p);
186   }
187   X q = X(length(p.xz)-t.x,p.y);
188   F res = length(q)-t.y;
189   return res;
190 }
191
192 F BoxFold(Y p, Y b) {
193   for (int i = 0; i < FB; i++) {
194     p.xz *= Rot(${R.d()} * 3 + 2);
195     p.xy *= Rot(${R.d()} * 3 + 1);
196     p.yz *= Rot(${R.d()} * 2 + 3);
197     p=abs(p);
198   }
199   Y q = abs(p) - b;
```



Nicole Vella
“The piece I decided on started as a work-in-progress from a long time ago that I wasn’t super excited about and I didn’t think could go anywhere because I was tunnel-visioned on it looking a specific way, but then showing it to people during one of our show-and-tells Piter said ‘this is cool, this is the one you should go with’ and everyone kind of agreed with that. Then I started getting other ideas and new directions that I could push it which I didn’t even think of before. If I didn’t have 11 other voices on my shoulders coaching me on then it wouldn’t have happened.”



ARTWORK OUTCOMES



N=12 is Feral File's first exhibition in its new 2.0 program. As part of this leap, the works in this exhibition (and all following) are exhibited and sold in Sets, centered around a single, ambitious theme. Sets include one artwork from each artist in the exhibition, creating micro-viewing and -collecting experiences within the show. Presented on this spread is Set #1 from **N=12**.

