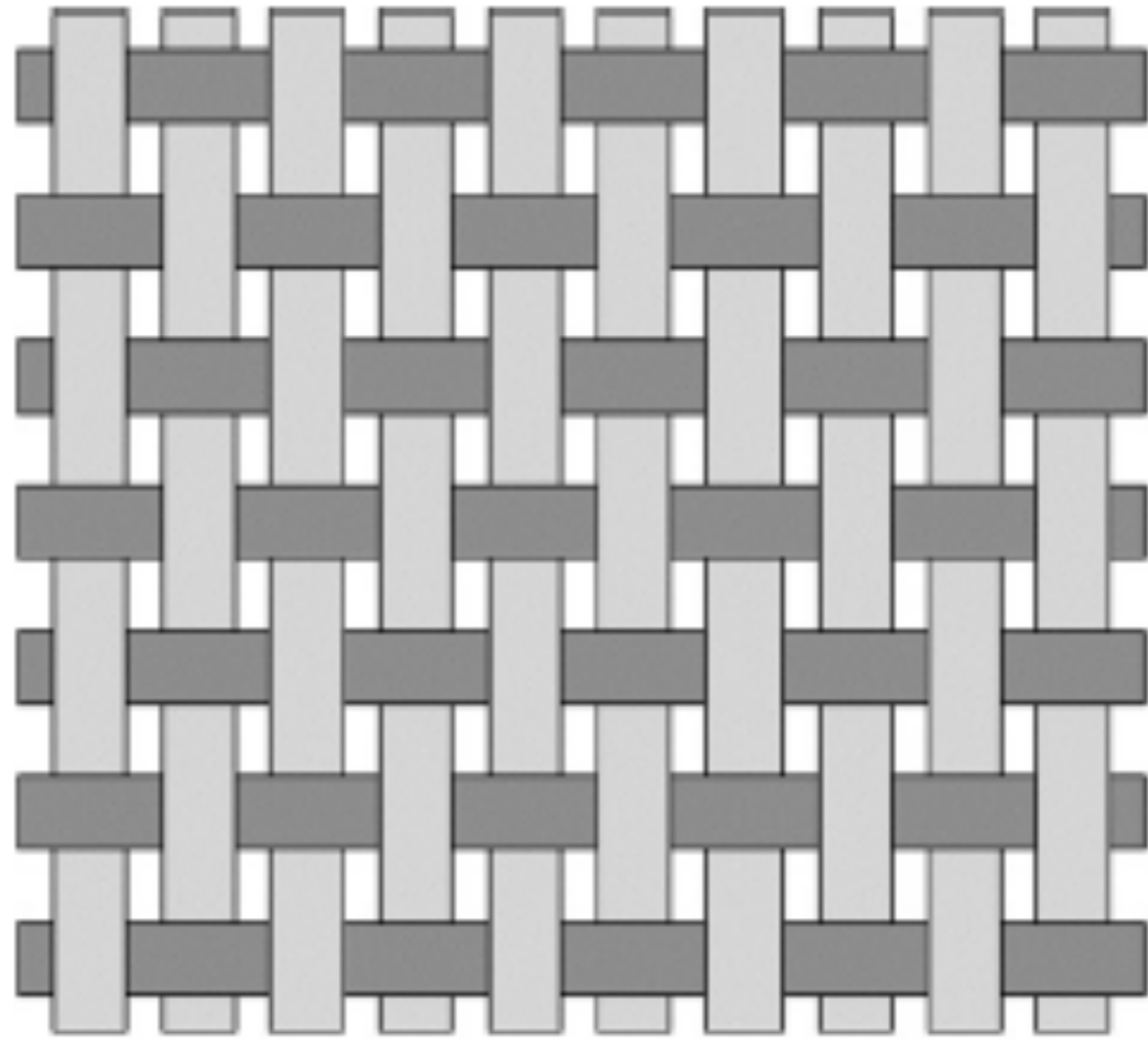


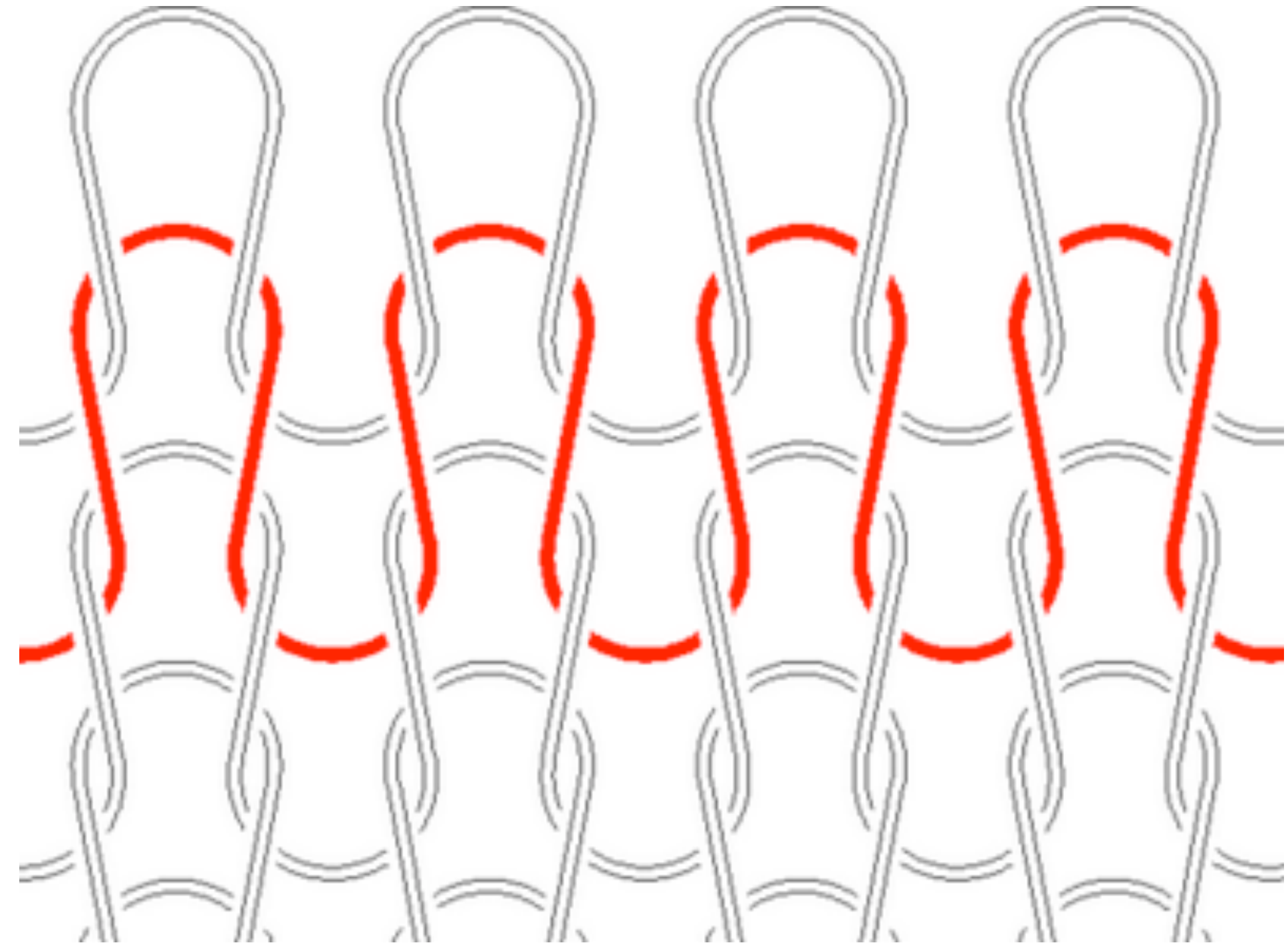
material programming

toward malleable knit software

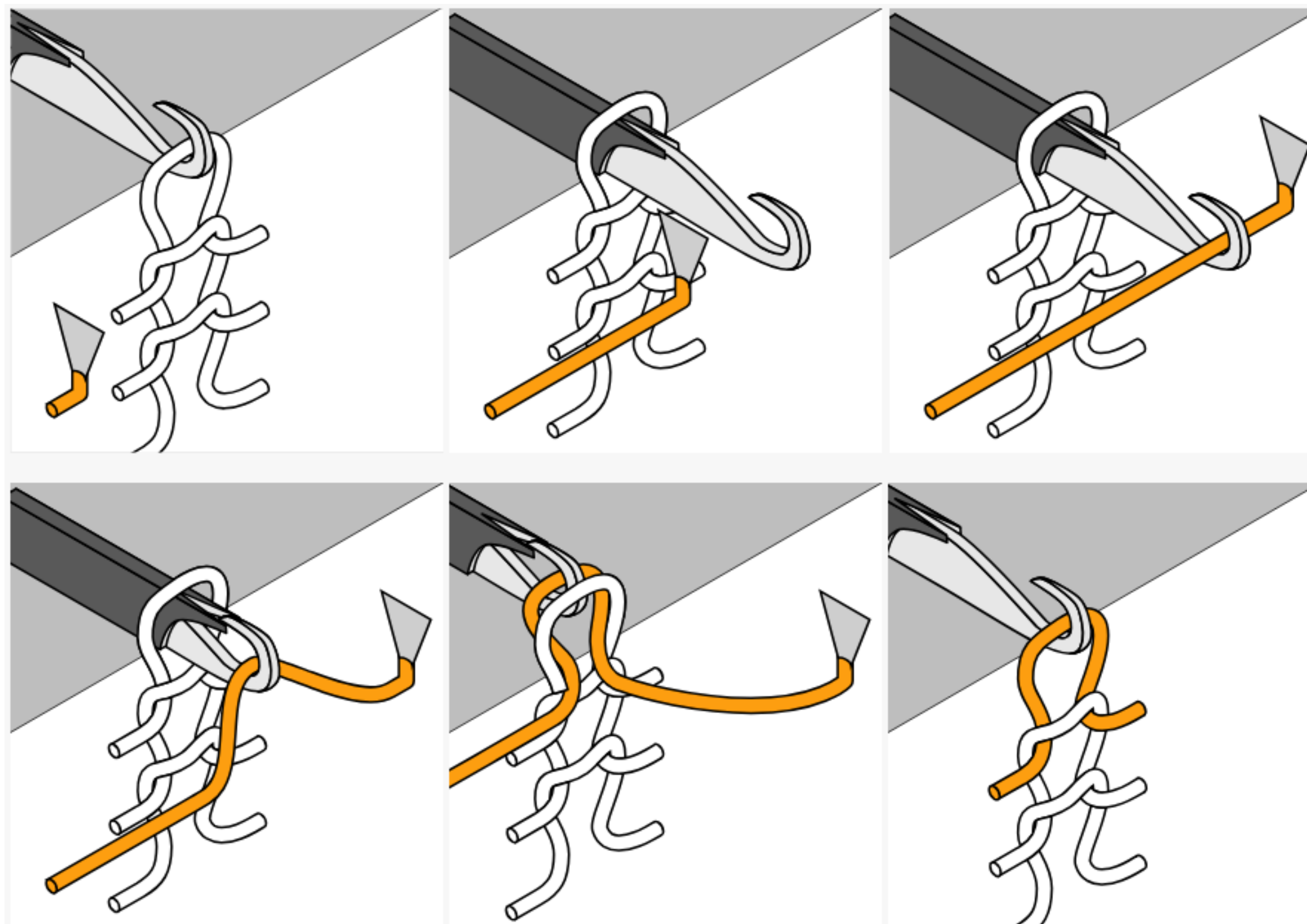
Agnes Cameron, B Claxton, Claire Anderson
University of the Arts London



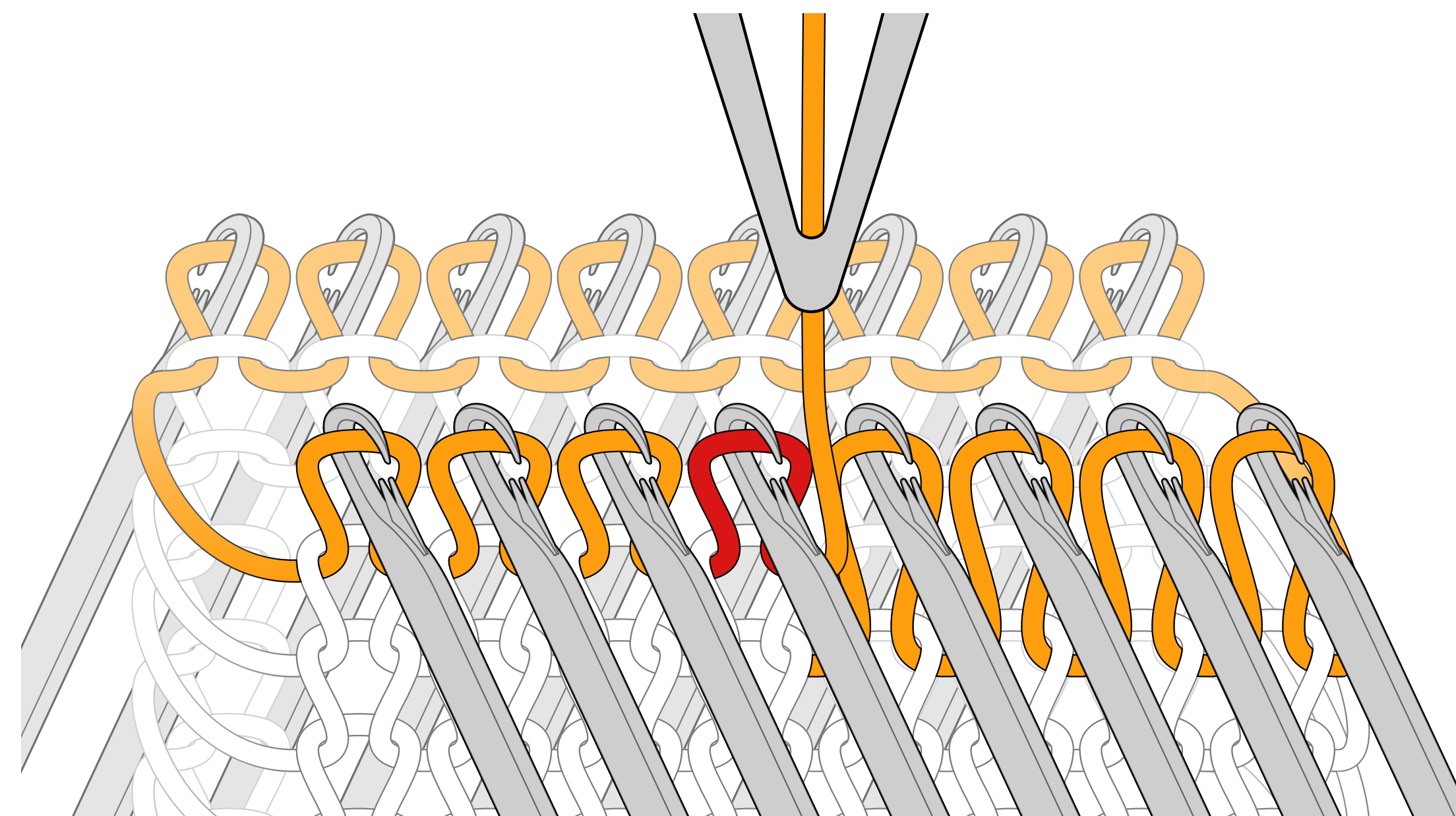
woven fabric



(weft) knit fabric



creating a new stitch



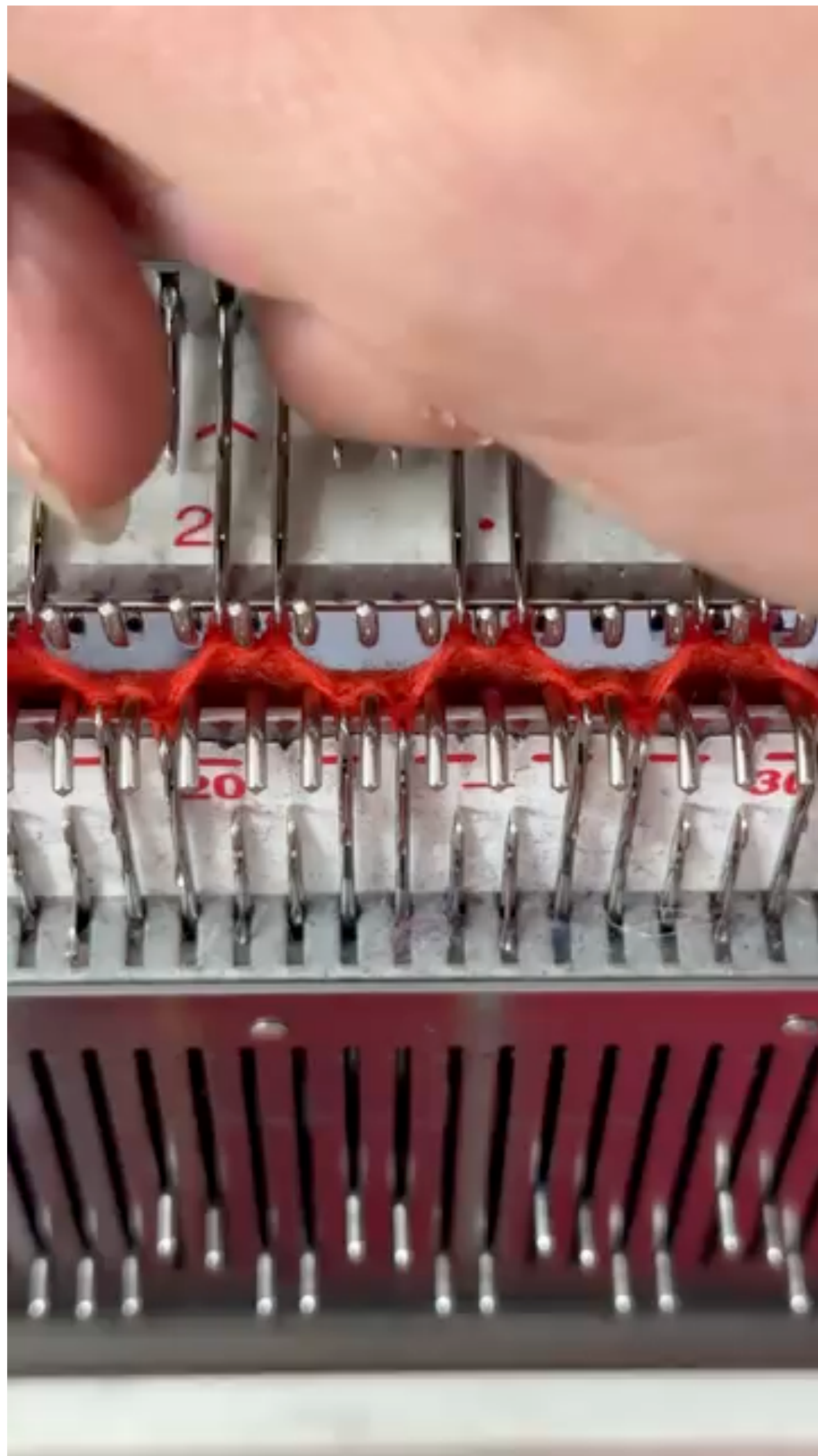
stitches in a row



domestic machine



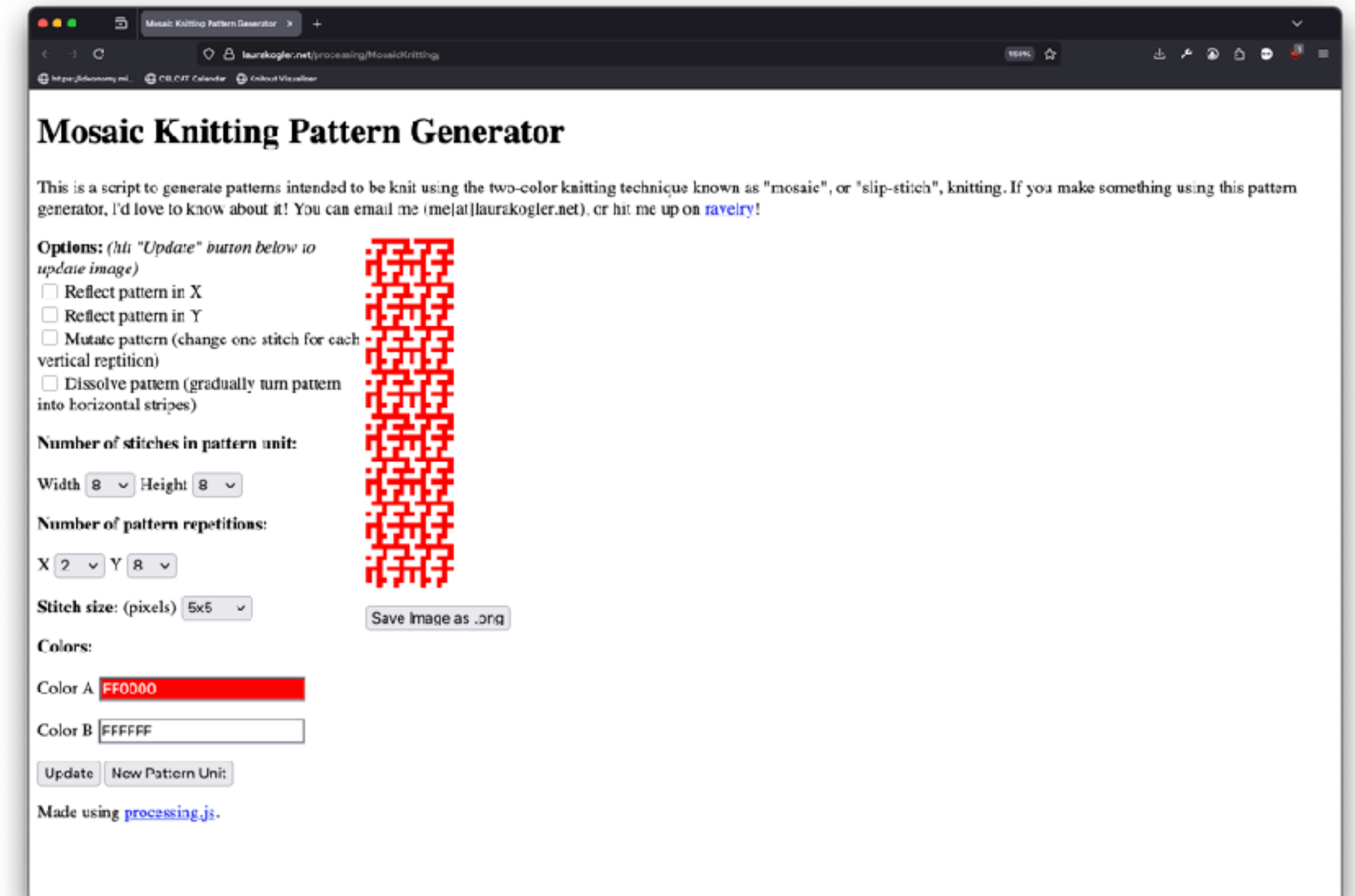
industrial machine



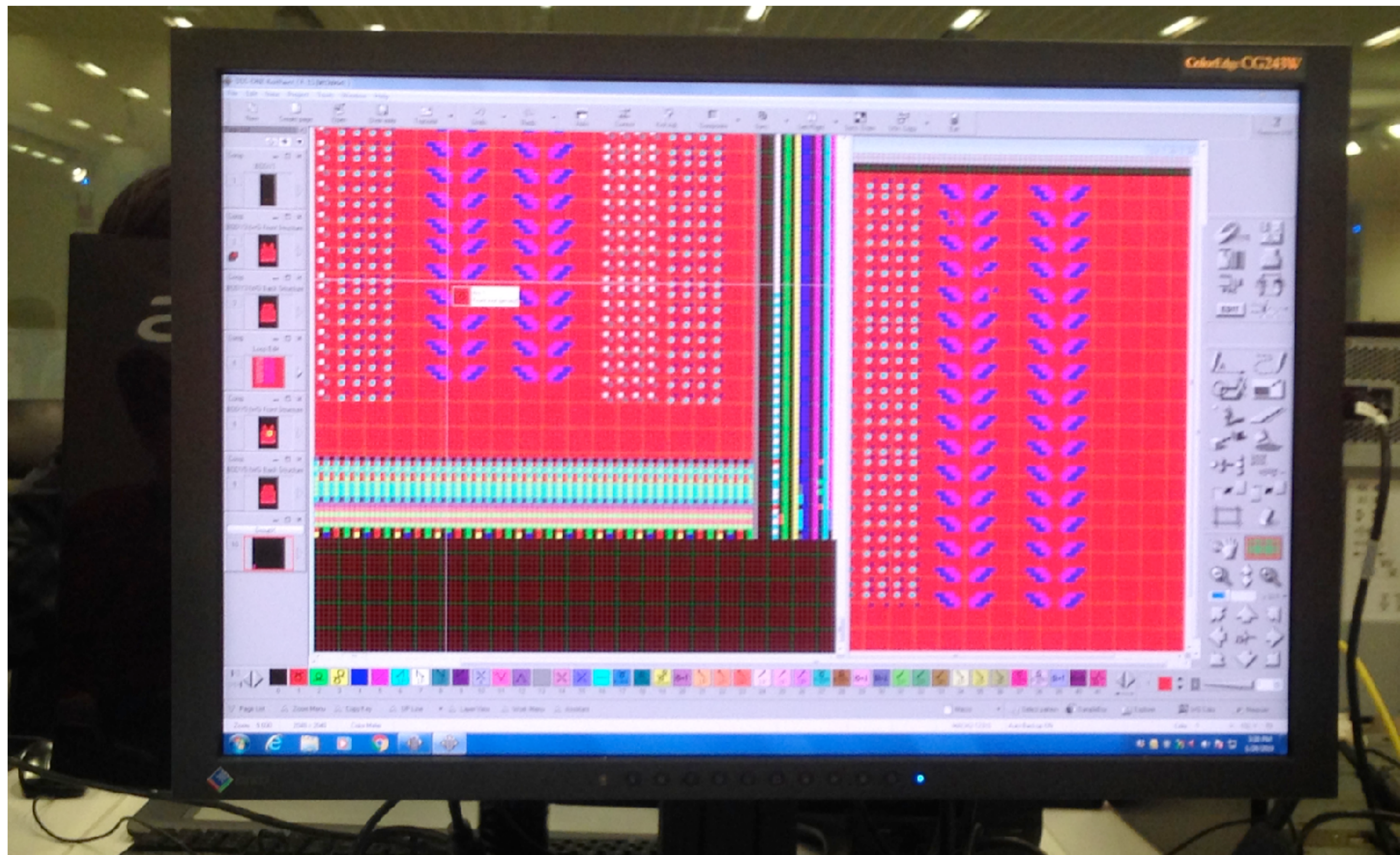
Videos via instagram:
[@anotherknittedthing](#)



Sponge bar replacement,
thoughtsandknits.com



Laura Kogler, Mosaic
 Knitting Pattern Generator



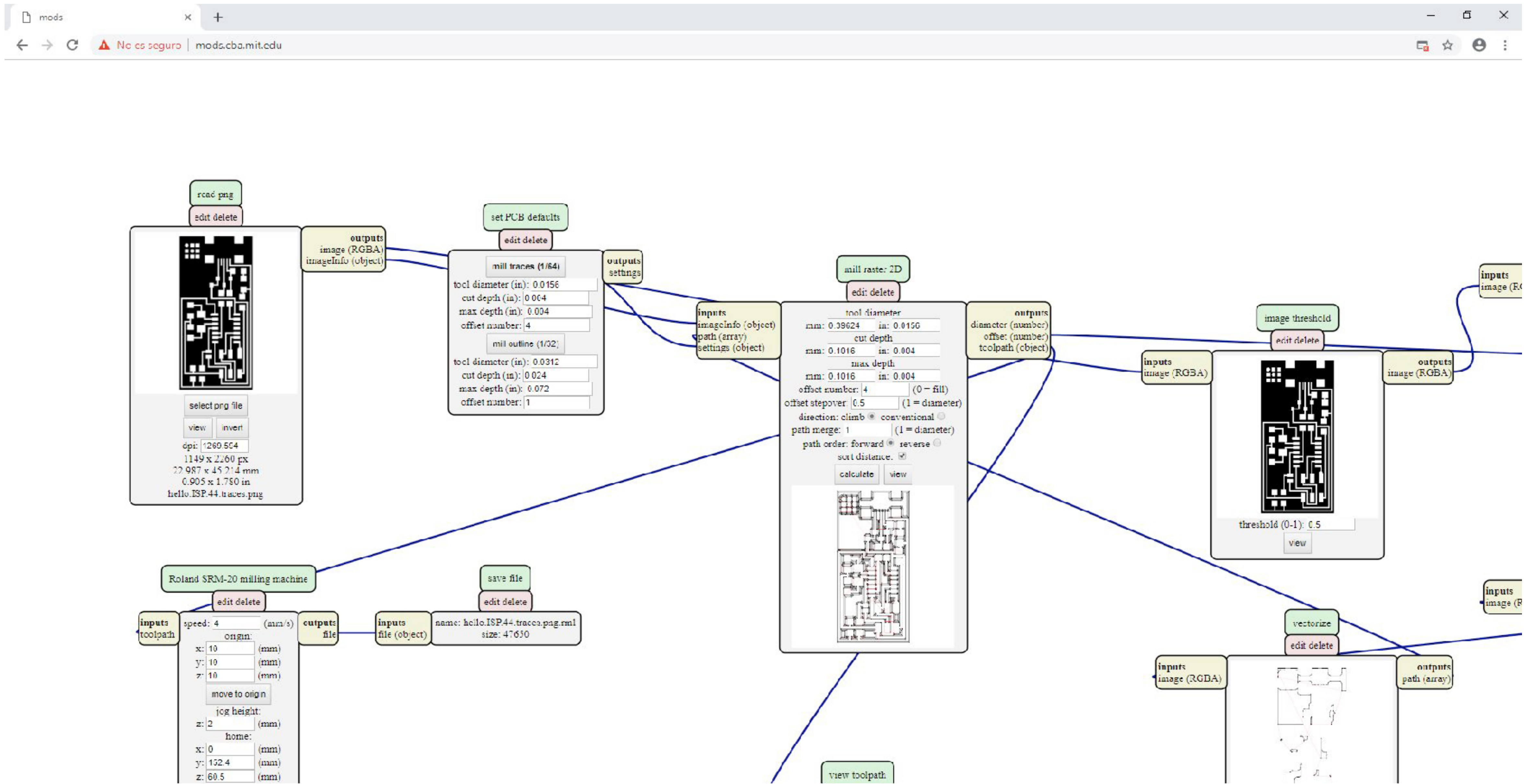
Shima Seiki APEXFiz



Kniterate Machine



From Ink and Switch, "Malleable Software"



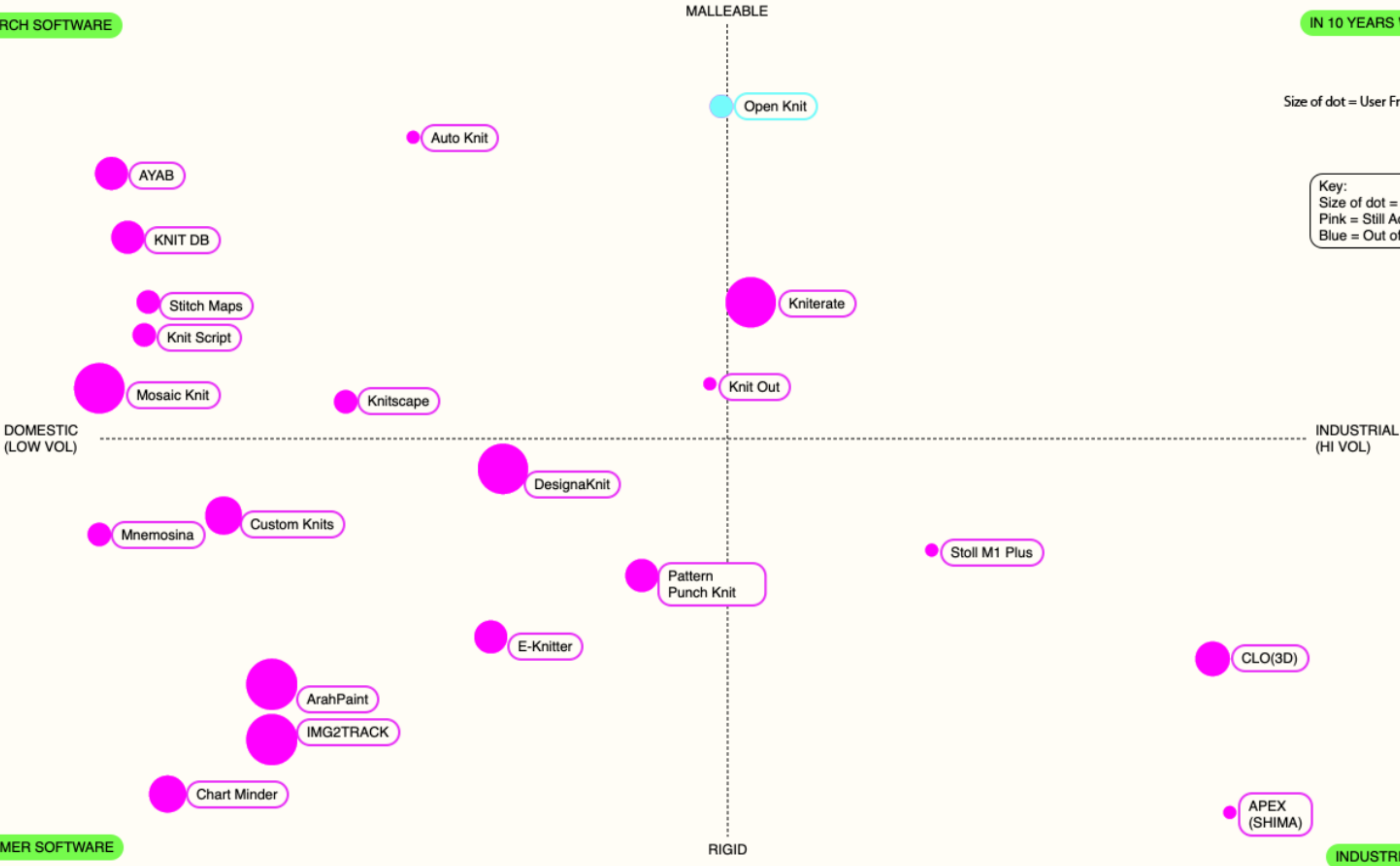
Fab Mods, MIT Center for Bits and Atoms

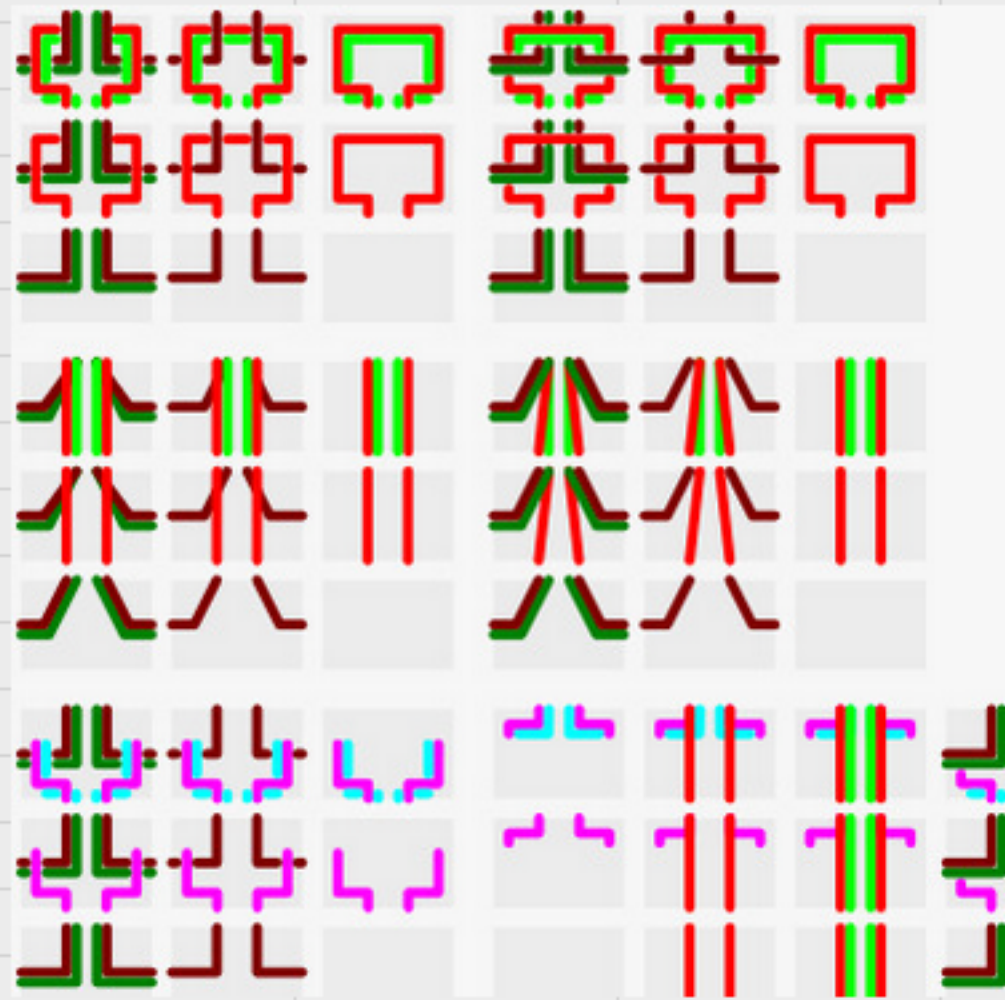
RESEARCH SOFTWARE

IN 10 YEARS WHAT IS HERE?

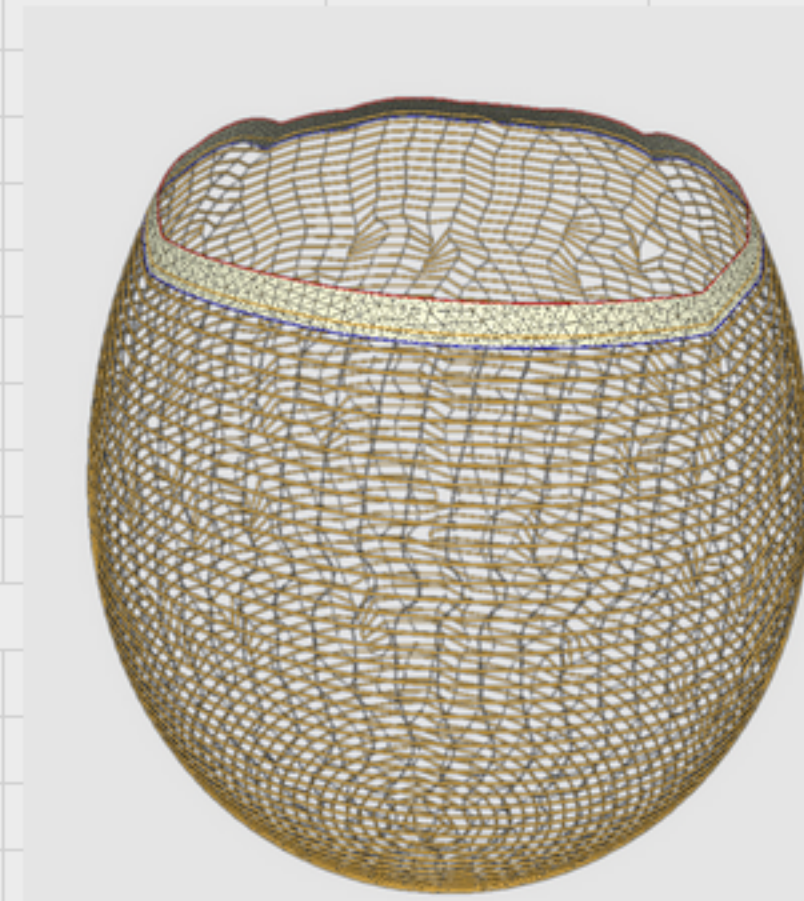
Size of dot = User Friendliness

Key:
Size of dot = User Friendliness
Pink = Still Active
Blue = Out of Action

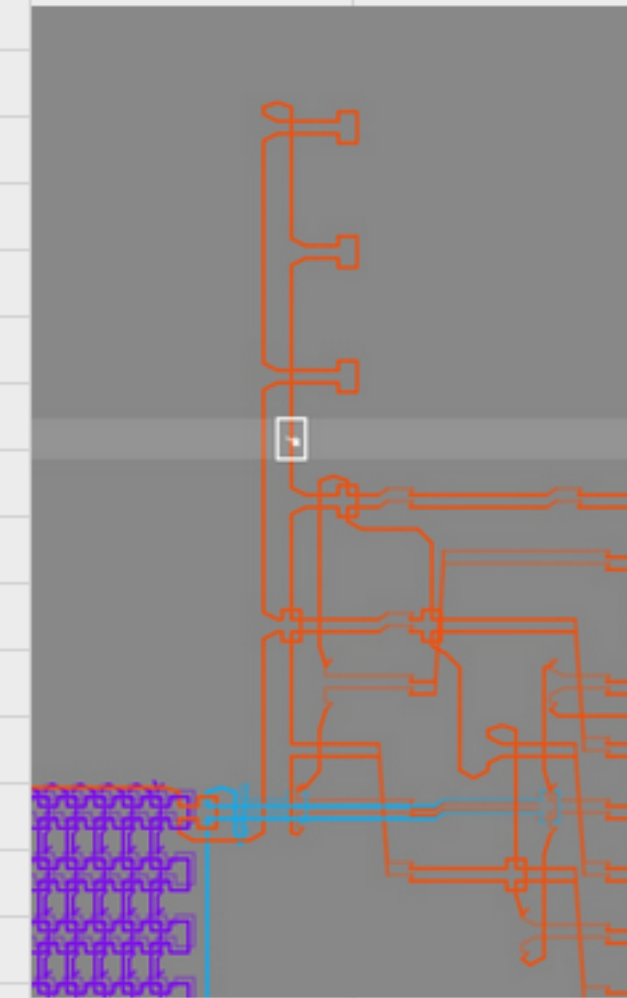




1,



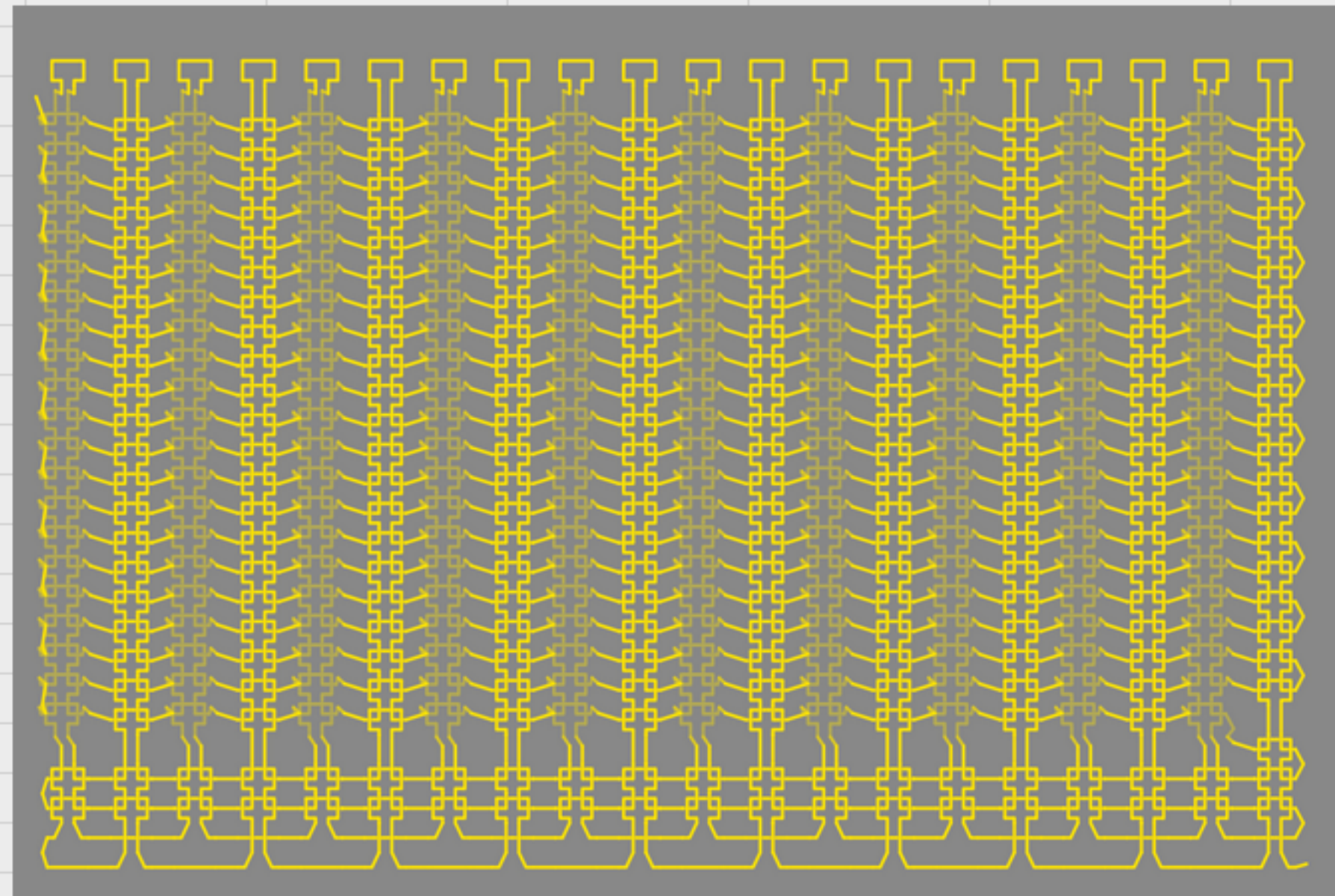
2,



3,



4,



5,

Early experiments
with the CMU
Textiles Lab Knitout
software

OPEN TEXTILE TOOLS INDEX

File Edit View Insert Format Data Tools Gemini Extensions Help

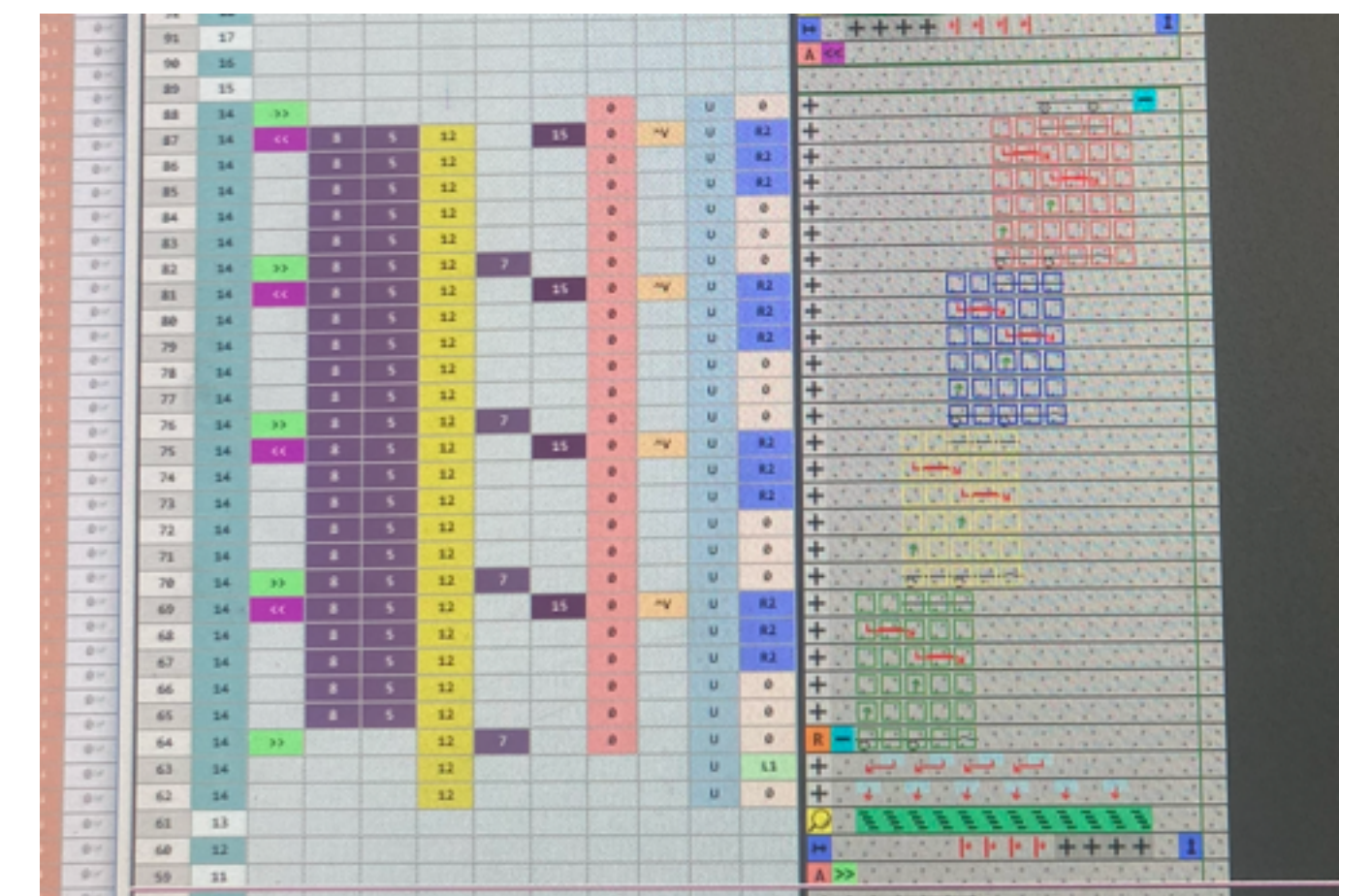
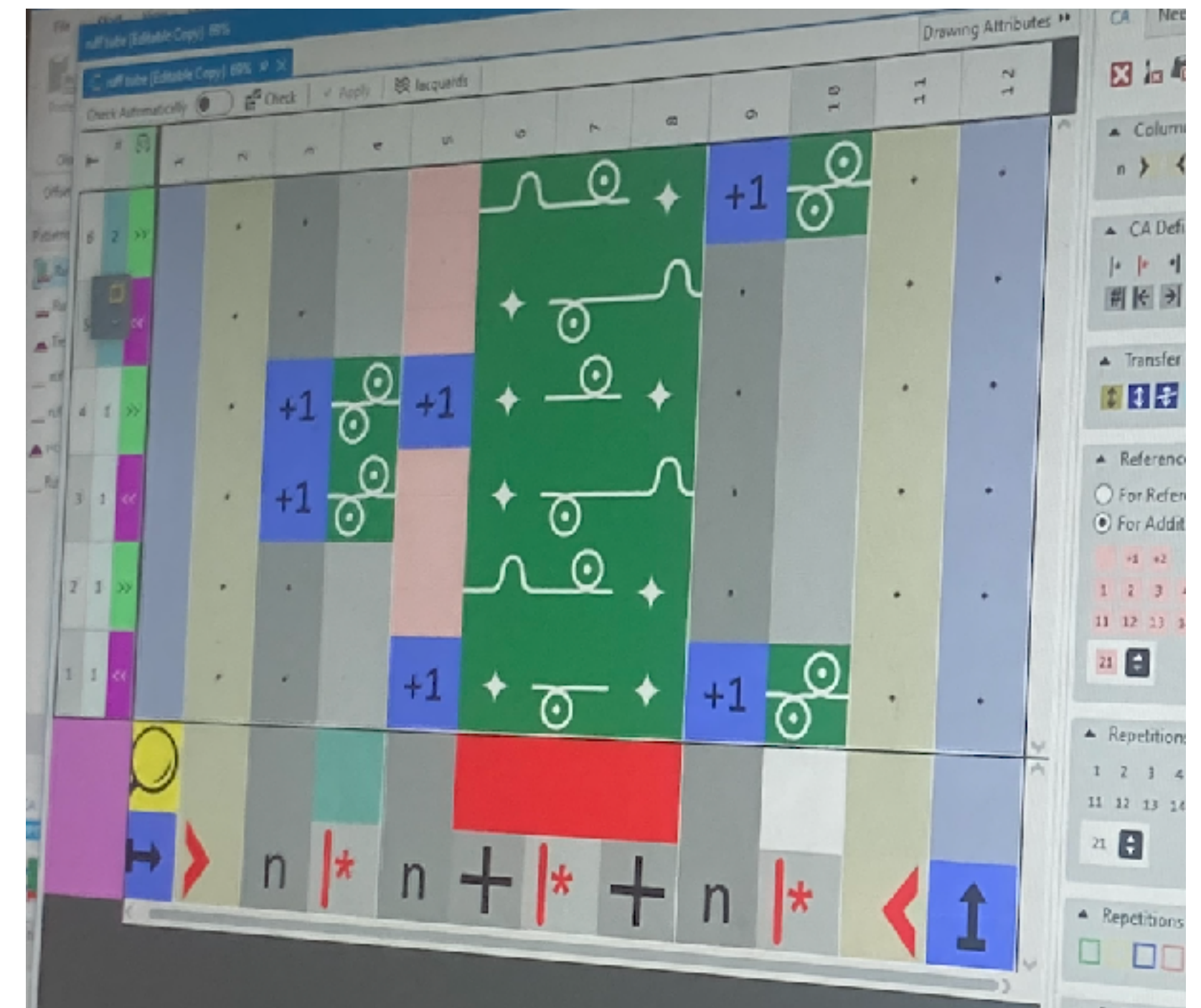
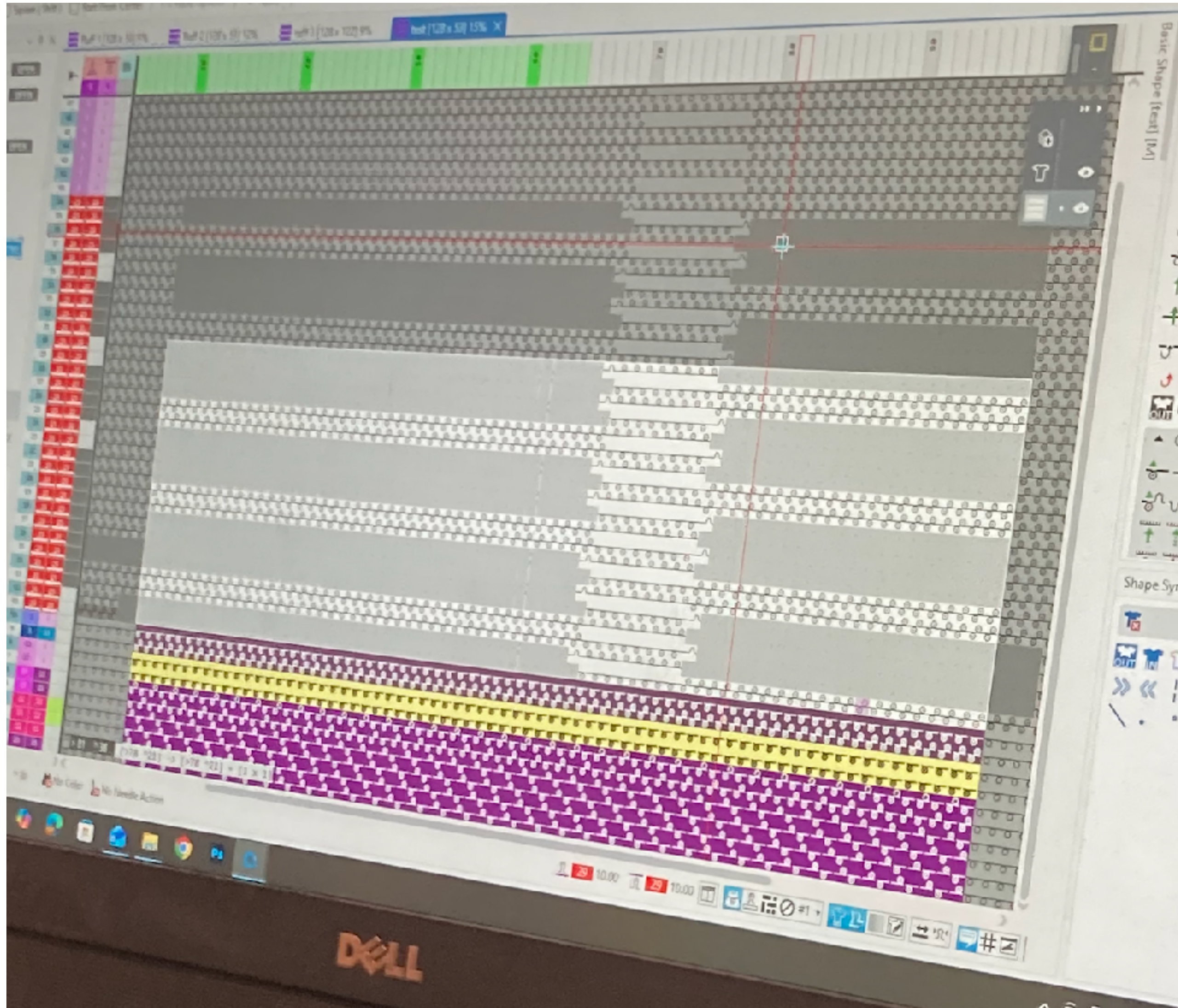
100% 123 Default... 10

	A	B	C	D	E	F	G	H	I	
	Name	URL	Developed By	Institution	Cost	Link to code	Description	Documentation	Related Publications	Machine C
1							pattern can be loaded into the knitting machine with a USB-to-serial adapter cable.			
10	KnitDB	https://github.com/textiles-lab/knitdb?tab=readme-ov-file		CMU Textiles Lab					https://dl.acm.org/doi/abs/10.1145/3332165.3347886	
11	Kniterate Editor	https://editor.kniterate.design/	Kniterate	Kniterate	free. A paid plan with further capabilities is expected in the future	N/A	Browser-based knit design software. Can import text-files exported from Designaknit			Kniterate r
12	Knitout	https://textiles-lab.github.io/knitout/	Jim McCann, Lea L Baugh	CMU Textiles Lab	free		file format for representing low-level knitting instructions			Industrial
13	Knitout Visualiser	https://textiles-lab.github.io/knitout-live-visualizer/		CMU Textiles Lab		https://github.com/textiles-lab/knitout-live-visualizer	Visualising knitout files in 2D			
14	Knitscape	https://knitscape.net/	Hannah Twigg-Smith	Machine Agency https://depts.washington.edu/machineagency/	free	https://github.com/machineagency/knitscape	knitscape is a browser-based tool for designing pattern repeats for knit slip/tuck colorwork. It was developed with domestic knitting machines in mind, but the charts are suitable for hand-knitting as well.			Any
15	KnitScript	https://github.com/logicologist/knitscript					KnitScript is a computer language that helps you design knitting patterns more easily. In KnitScript, patterns are composed of sub-patterns that let you describe which textures go where and how big those textures should be, instead of working at the level of individual stitch-by-stitch instructions.			
16	KnitScript	https://pypi.org/project/knit-script/	Megan Hofmann	ACT Lab at Northeastern University	free	https://github.com/mhofmann-Khoury/knit_script	Knit Script is a domain specific programming language for writing v-bed knitting machine instructions. The language is loosely based on conventions from Python 3 but includes support for controlling a knitting machine. The code is interpreted into knitout which can then be processed into instructions for different	https://mhofmann-khoury.github.io/knit_script/	https://dl.acm.org/doi/10.1145/3586183.3606789	Industrial, p Shima Seik

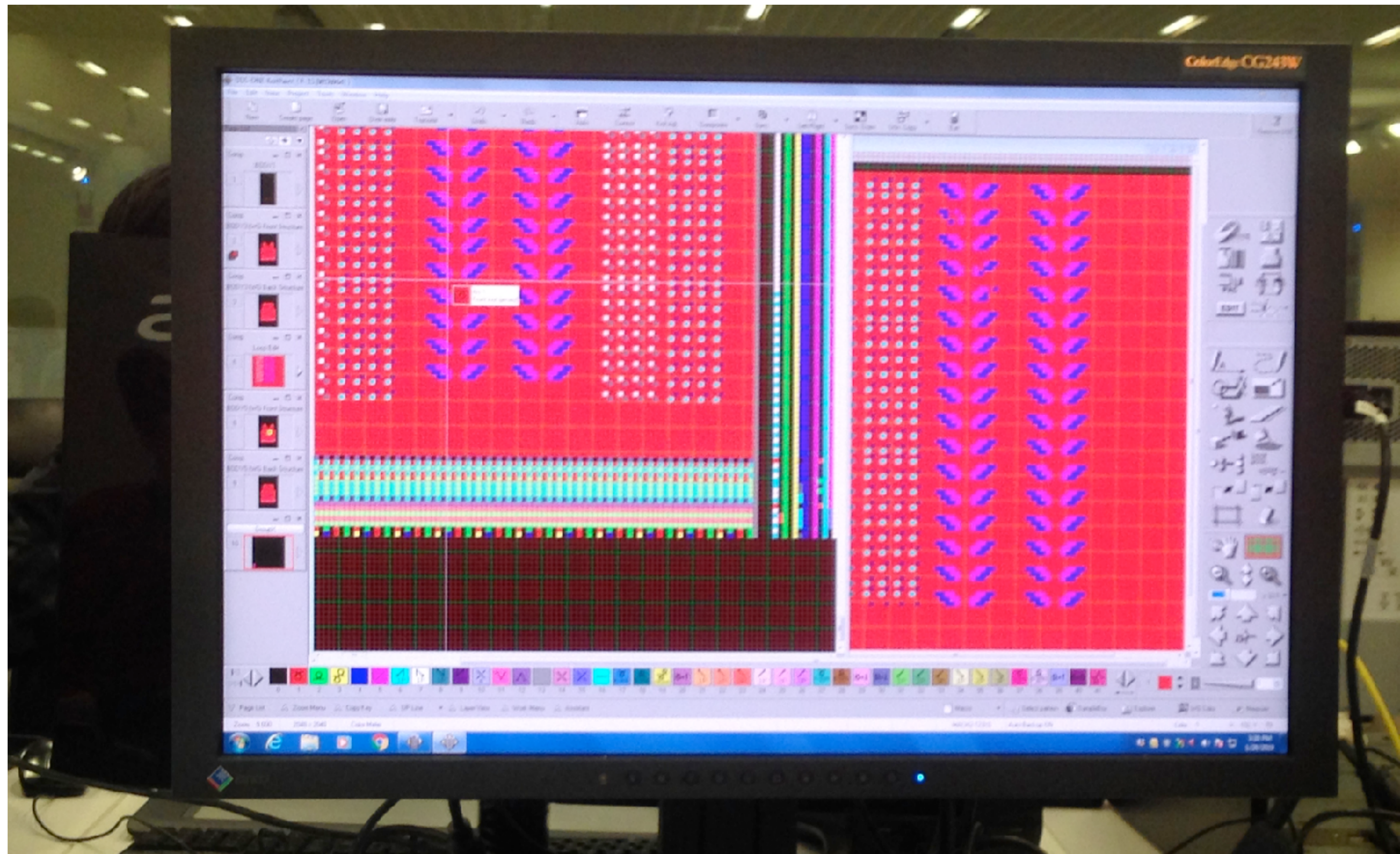
KNIT WEAVE ABOUT

Contribute to the Open Textile Tools Index!

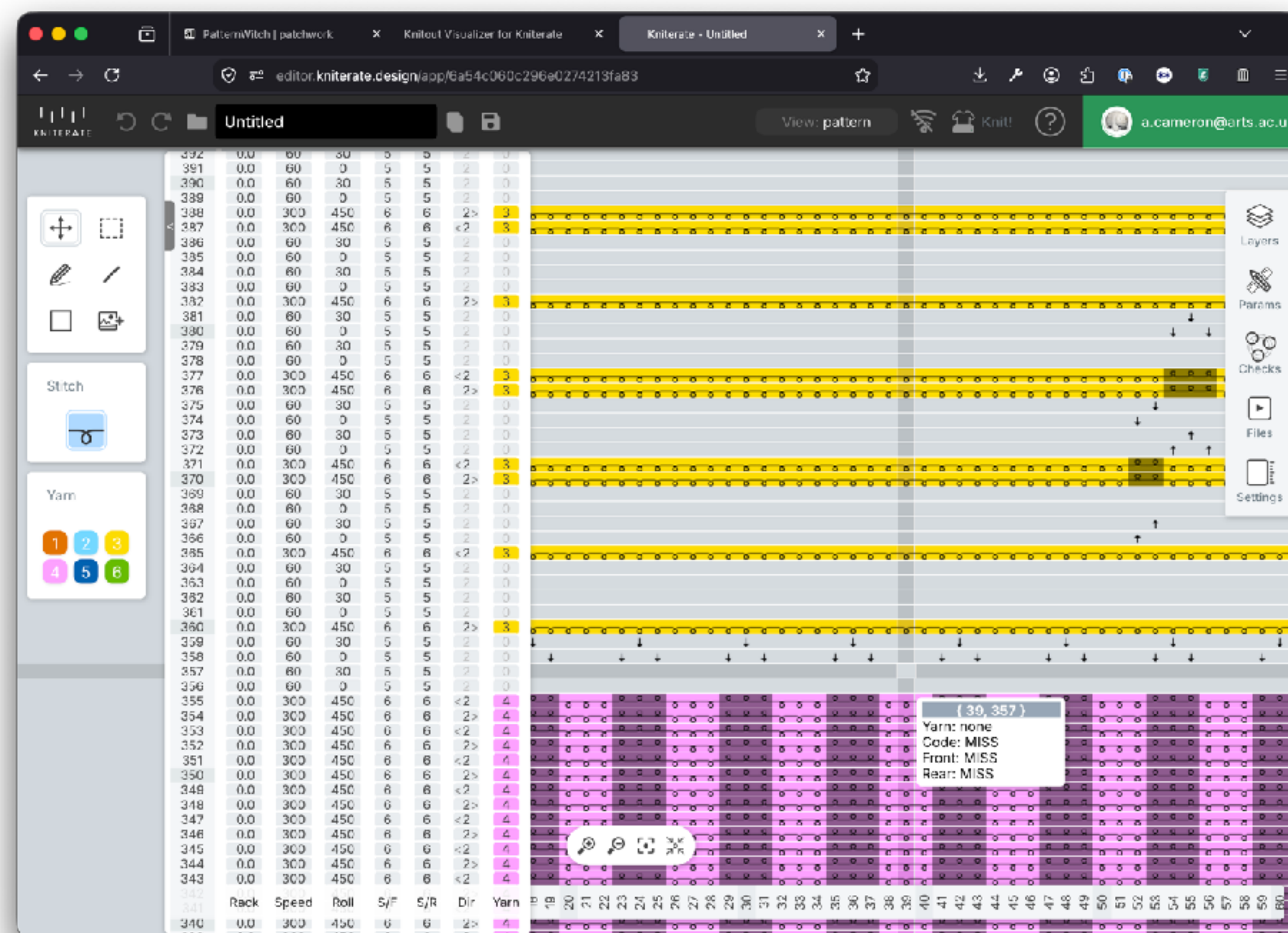
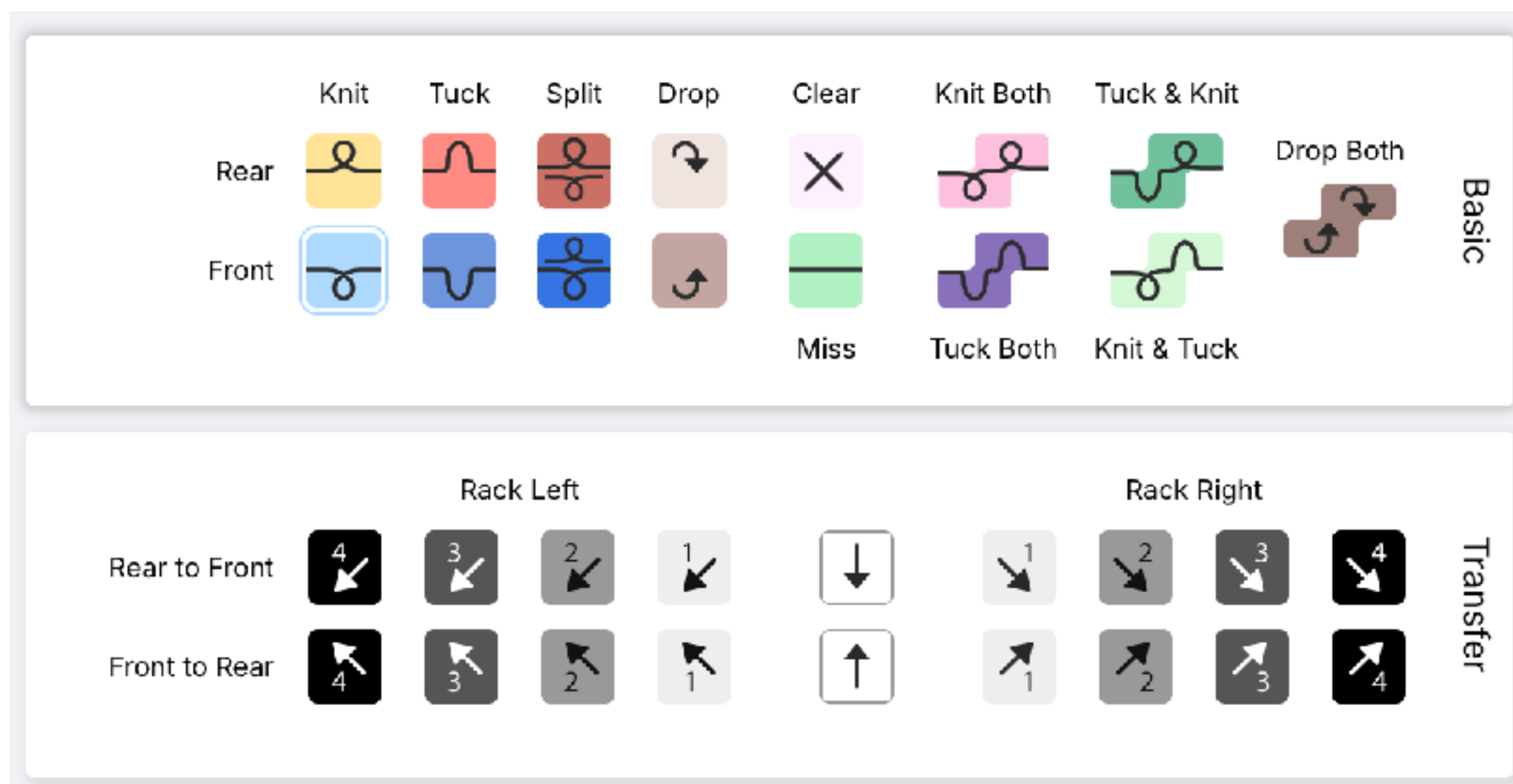
knitting software



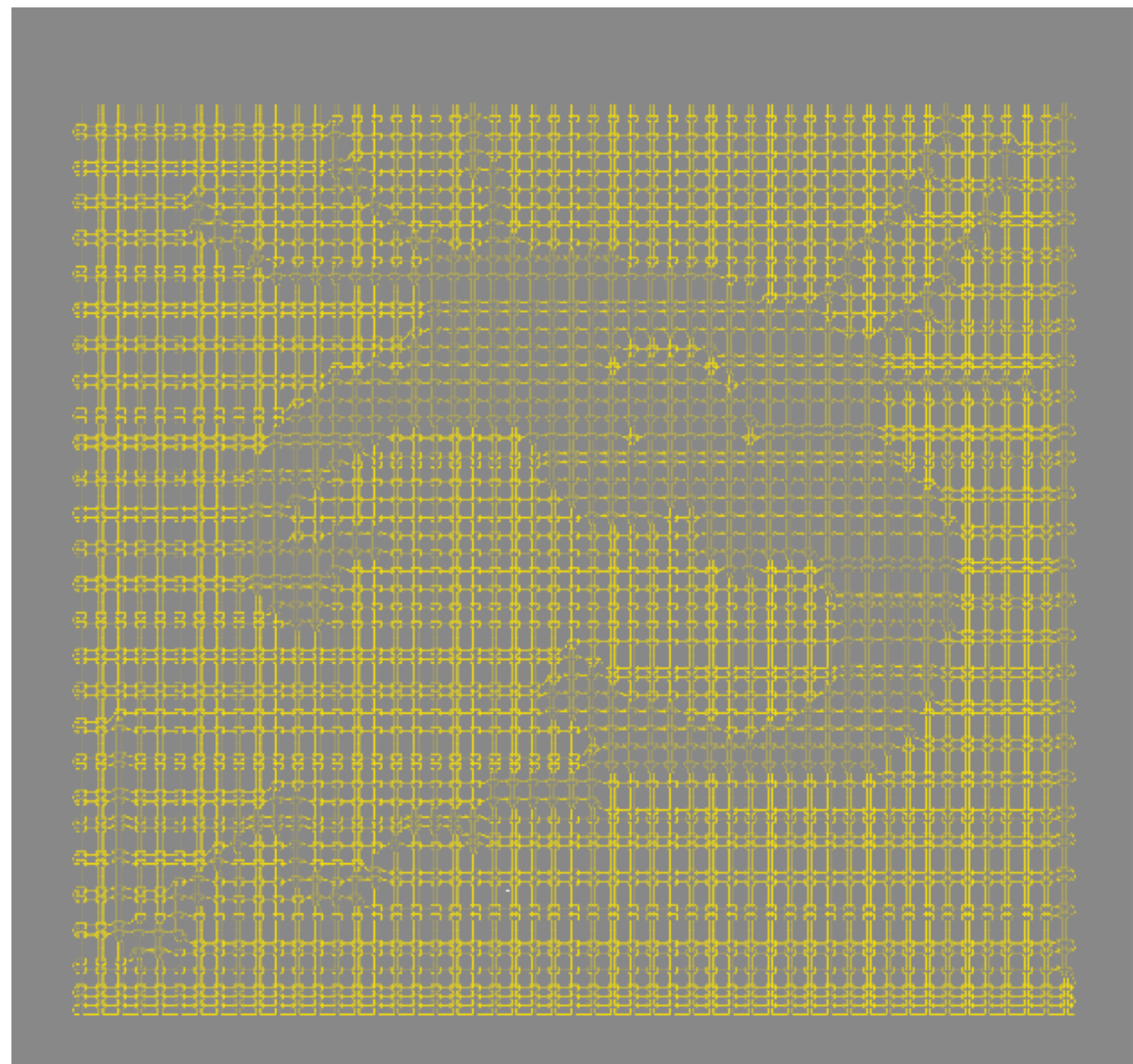
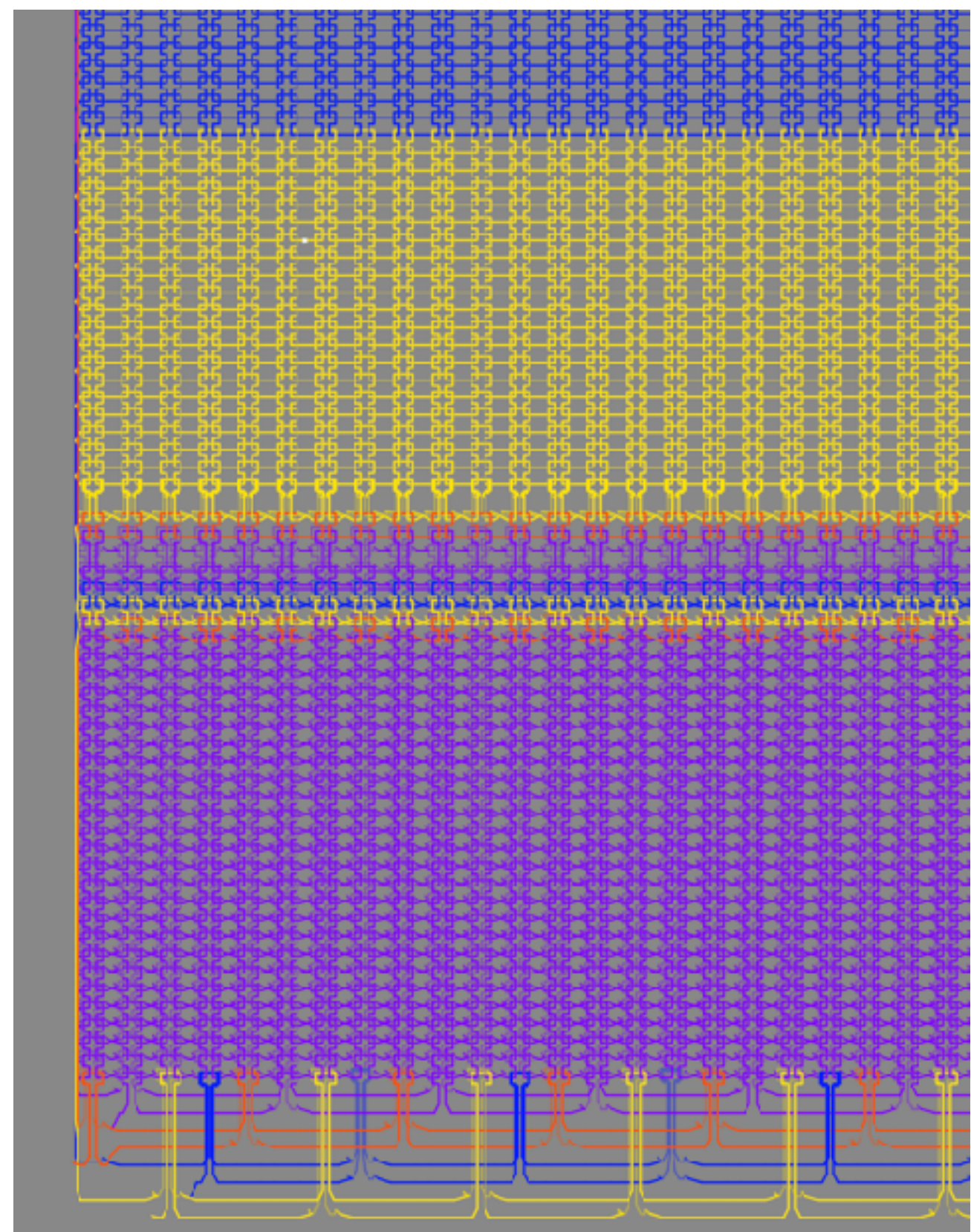
Stoll CreateLite



Shima Seiki APEXFiz



Kniterate Editor — you can make an account for free!



CMU Knitout Visualiser (forked Kniterate version)

make knitted textiles with knitout-JS

Knitout Visualizer for Kniterate

agnescameron.github.io/knitout-visualizer-kniterate/110%

Load a knitout or js file

(editor)

Run/Show

Save KCode

Save JS

☐ Show Knitout

☐ Add Waste Section

? guide github page

```
1
2 //this is javascript code that produces knitout
3 const knitout = require('knitout');
4
5 // need this line for kniterate
6 let k = new knitout.Writer({carriers:["1", "2", "3", "4", "5", "6"]});
7
8 // sample width = max_needle - min_needle
9 // sample width should be >20!
10
11 let min_needle = 50;
12 let max_needle = 80;
13 let rows = 40;
14 let main_carrier = "3";
15
16 k.in(main_carrier);
17
18 for (let r = 0; r < rows; ++r) {
19   //even numbered rows knit left to right
20   if (r%2 == 0) {
21     for (let n = max_needle; n >= min_needle; --n){
22
23       // knit a stitch on the front bed
24       k.knit("-", "f" + n, main_carrier);
25     }
26   }
27
28   //odd numbered rows knit right to left
29   else {
30     for (let n = min_needle; n <= max_needle; ++n){
31
32       // knit a stitch on the front bed
33       k.knit("+", "f" + n, main_carrier);
34     }
35   }
36 }
37
38 k.out(main_carrier);
39
40
```

Reset Zoom

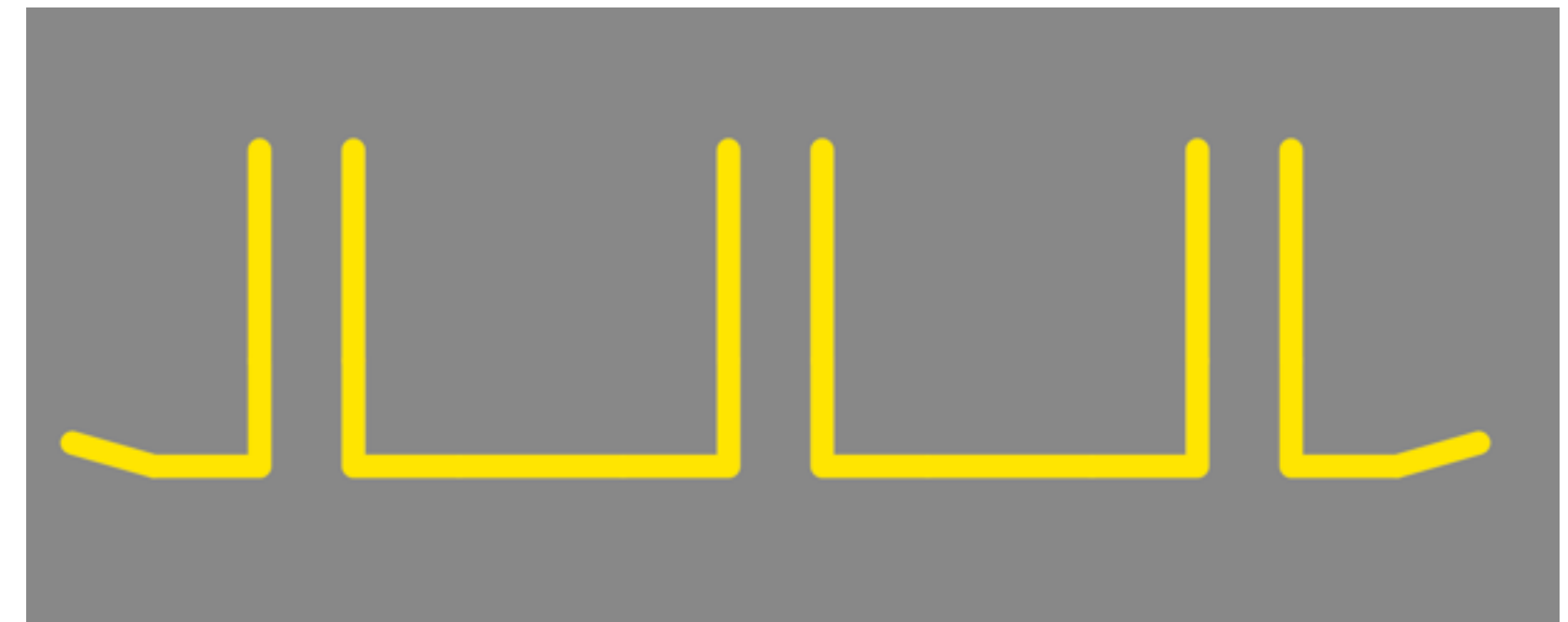
Knitout visualiser for Kniterate

```
k.knit("-", "f1", "3");
```



knitting a single stitch

```
k.knit("+", "f1", "3");  
k.knit("+", "f2", "3");  
k.knit("+", "f3", "3");
```



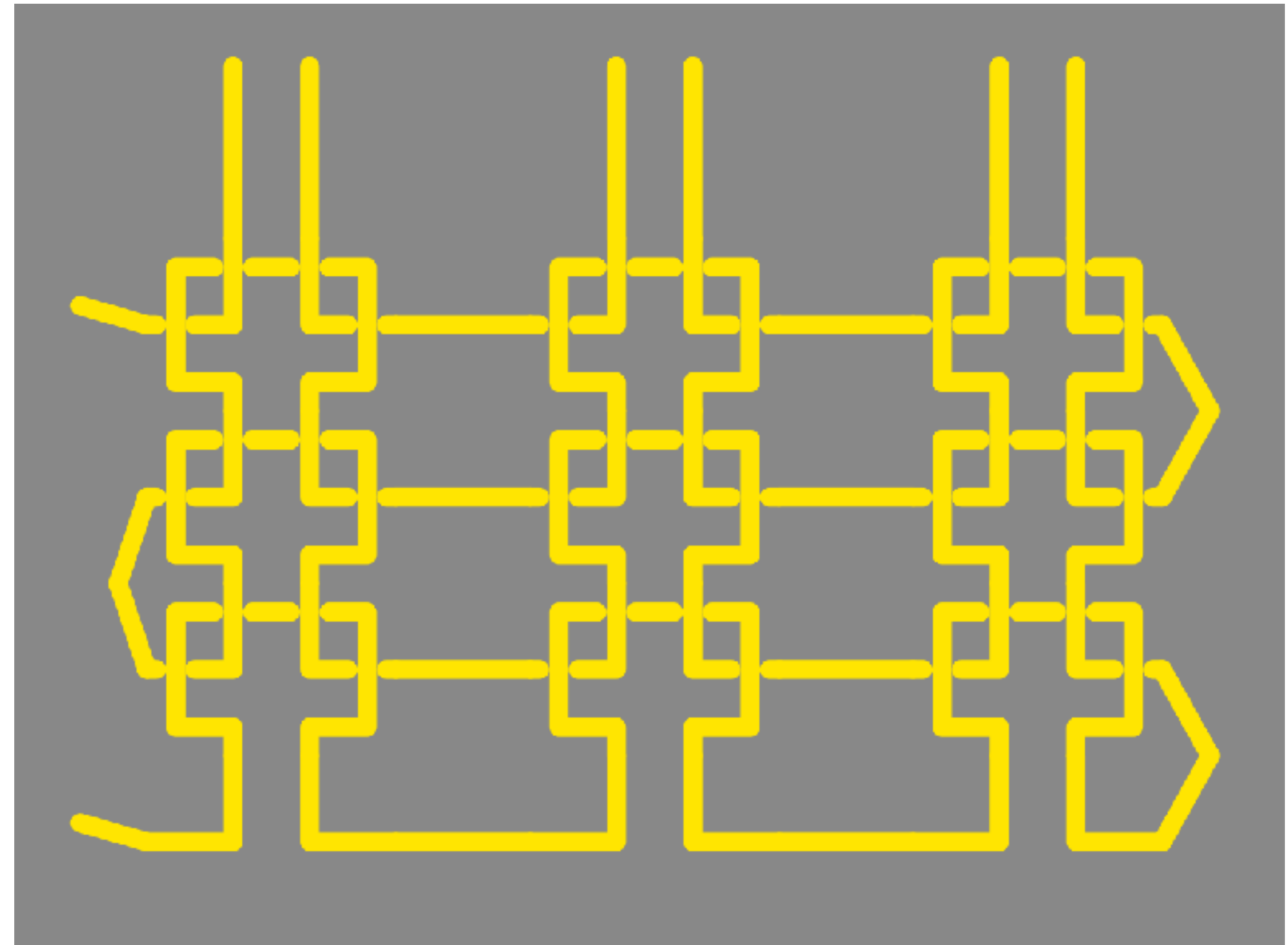
first row (not casting on)

```
k.knit("+", "f1", "3");  
k.knit("+", "f2", "3");  
k.knit("+", "f3", "3");
```

```
k.knit("-", "f3", "3");  
k.knit("-", "f2", "3");  
k.knit("-", "f1", "3");
```

```
k.knit("+", "f1", "3");  
k.knit("+", "f2", "3");  
k.knit("+", "f3", "3");
```

```
k.knit("-", "f3", "3");  
k.knit("-", "f2", "3");  
k.knit("-", "f1", "3");
```



more rows!

```

let rows = 40;
let main_carrier = "3";

k.in(main_carrier);

for (let r = 0; r < rows; ++r) {
  //even numbered rows knit left to right
  if (r%2 == 0) {
    for (let n = max_needle; n >= min_needle; --n){

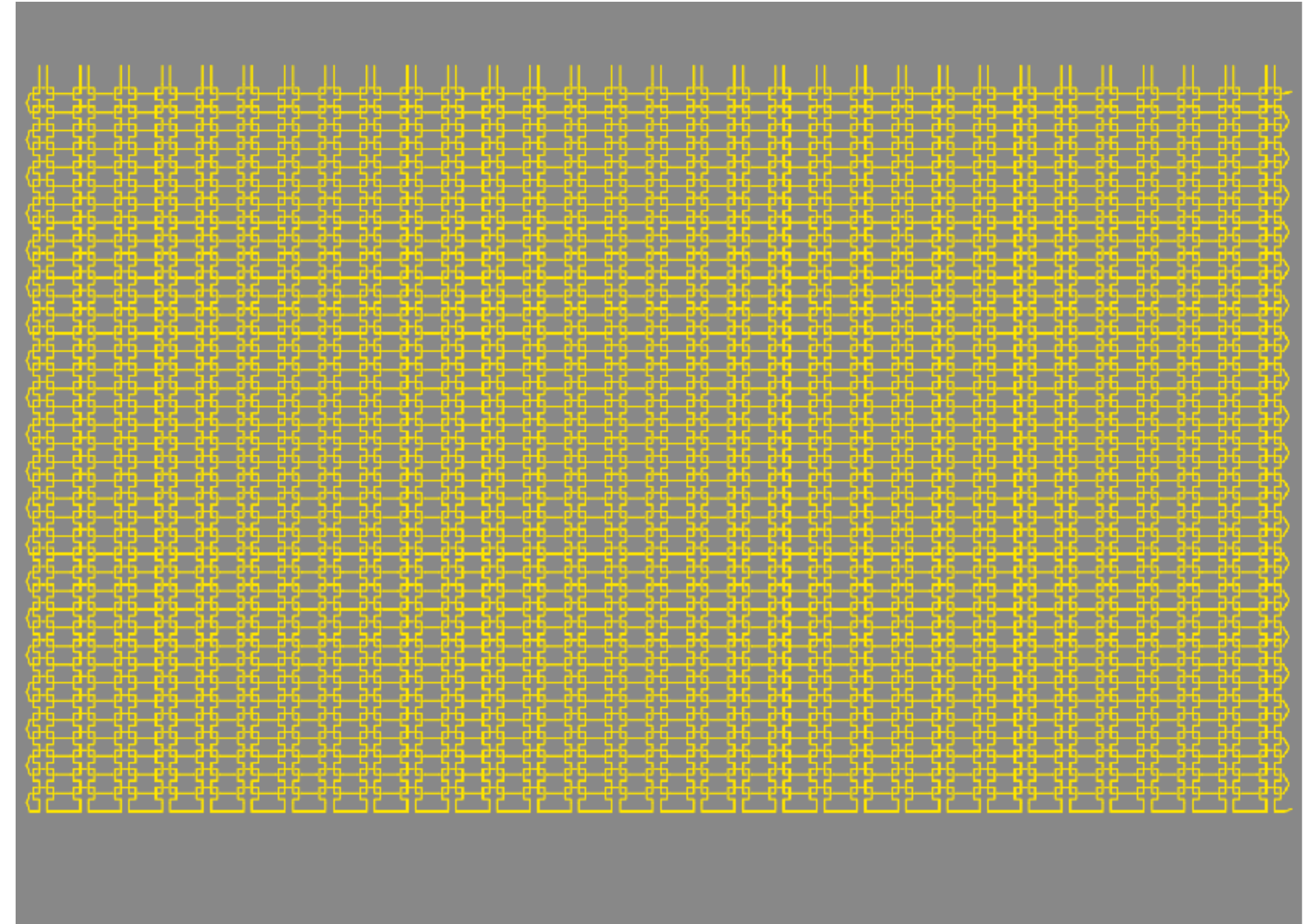
      // knit a stitch on the front bed
      k.knit("-", "f" + n, main_carrier);
    }
  }

  //odd numbered rows knit right to left
  else {
    for (let n = min_needle; n <= max_needle; ++n){

      // knit a stitch on the front bed
      k.knit("+", "f" + n, main_carrier);
    }
  }
}

k.out(main_carrier);

```



more rows!

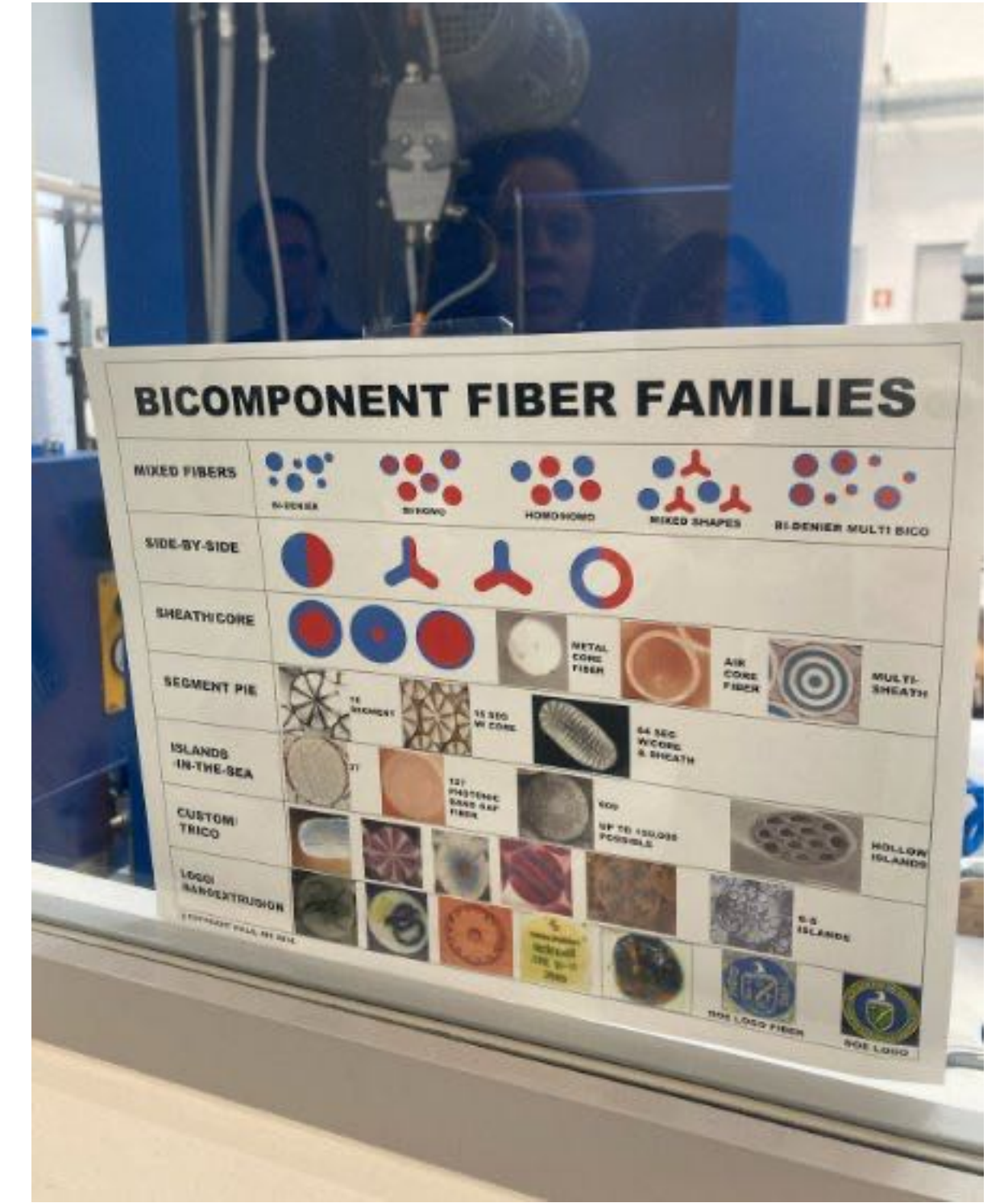
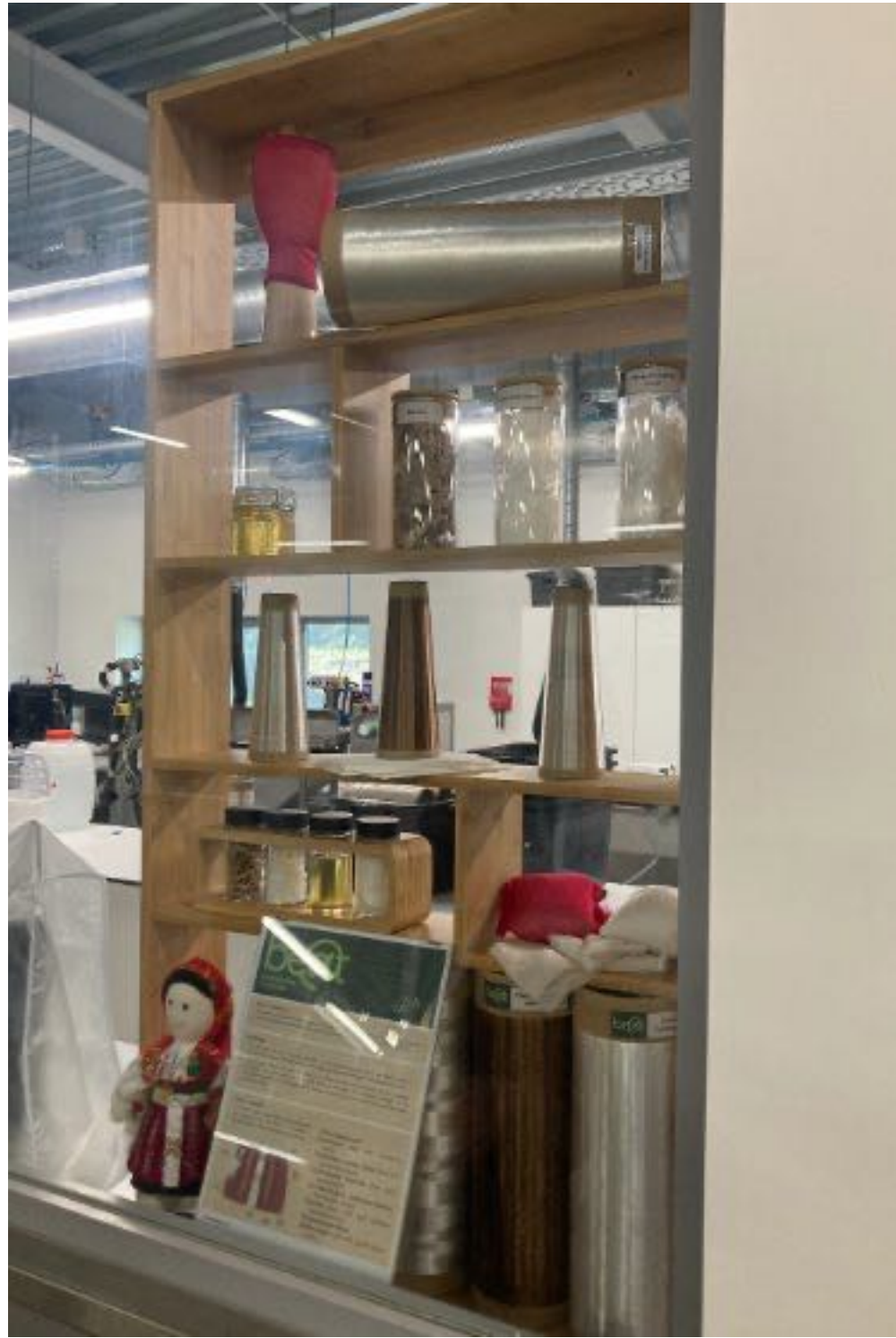
textile machinery



Images: 1. Industrial 3-d Loom 2. Industrial washing machine 3. Robotic arms for selecting fabrics 4. Industrial embroidery machine



Images: 1. Mannequin to test performance fabrics 2. Conductive yarns 3. 3d printer using robotic arm 4. Pieces made on robotic arm 3d printer



Images: 1.Bio Component Fibres 2. Yarn spinning machine 3. Fiber Families



<https://cci.arts.ac.uk/~material/>

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b.claxton@arts.ac.uk

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