

Computational Woodcut: A visual guide to the process

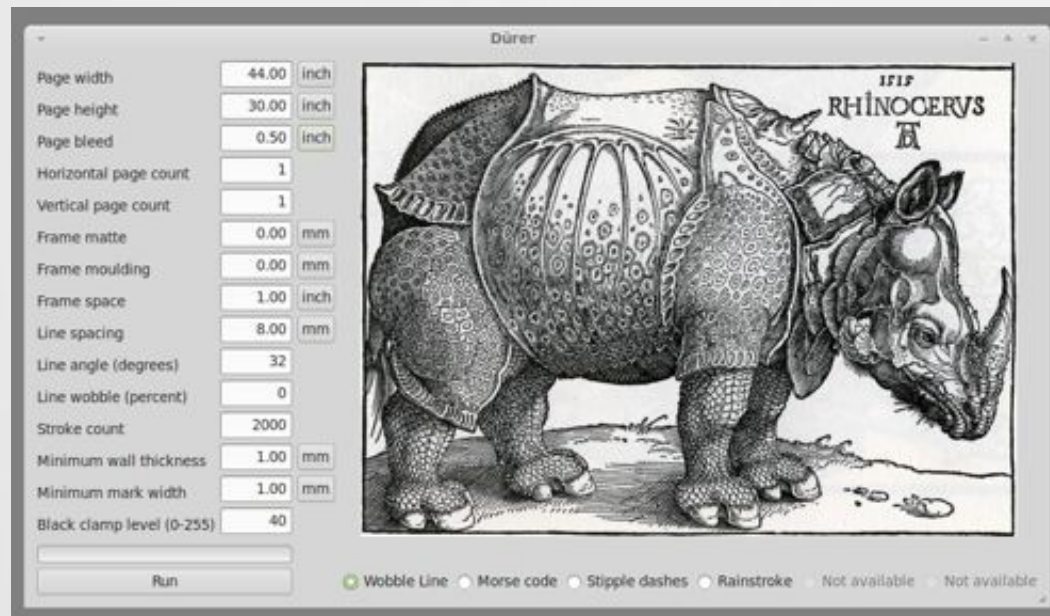
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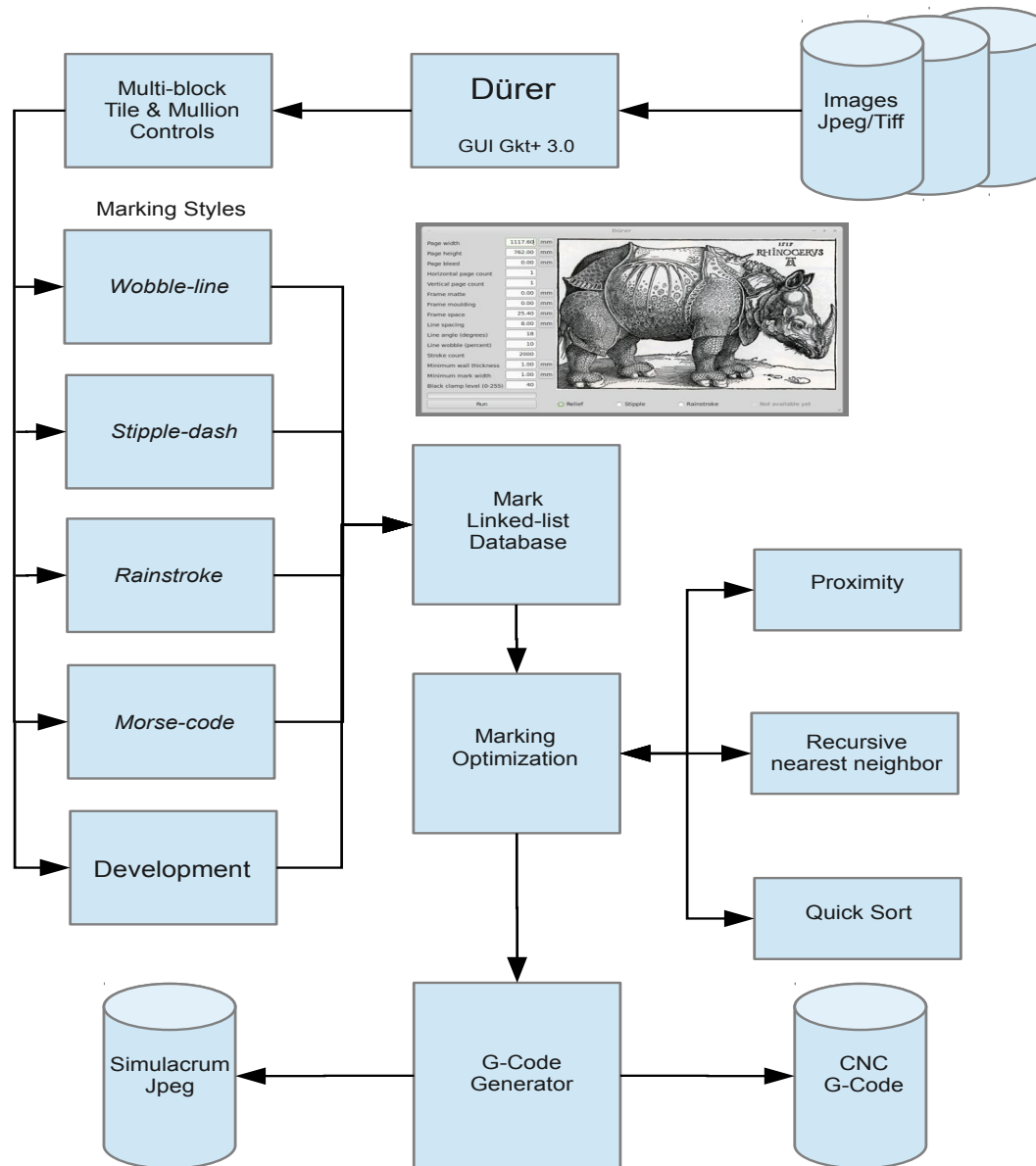
Triumphal Arch (Class II), 8ft x 12ft, was printed at Banff in June/July 2012.

Step 1. Processing the Image in Dürer

The color digital photograph is processed by the software we built - Dürer – according to the parameters the user sets in the table. We currently have four mark making styles written (Wobble line, Morse code, Stipple dash, and Rainstroke) and we can vary the visual effects of each by changing other settings, like how far apart the lines in Wobble Line are set.



Graphical User Interface for Dürer



Dürer system diagram

This is the flow of operations for what Dürer is doing when it processes the image.

Dürer generates G-code cutting instructions for the CNC milling machine as well as a 'simulacra' image, which gives a sense of what the printed image would look like, including flipping it horizontally since printing plates always print in reverse.



Sample piece of G-code generated for cutting this image:

```
N100 G40 G54 G80 G90 G94      (safety block)
N110 T1M6
      (Tool: 60.0 degree conical mill with a 0.000 inch diameter tip)
N120 M03 S15000;              (spin clockwise at 15,000 RPM)
N130 G20                      (inch mode)
N140 G17                      (xy plane selection)
N150 G00 X0.0 Y0.0 Z1.0; (go to the origin)
      (intaglio cut #1)

G00 X0.000 Y0.380 Z0.100
G01 X0.000 Y0.340 Z-0.203 F60
G01 X0.010 Y0.290 Z-0.201
G01 X0.020 Y0.240
G01 X0.040 Y0.190 Z-0.205
G01 X0.060 Y0.140 Z-0.199
G01 X0.070 Y0.090 Z-0.183
G01 X0.090 Y0.040 Z-0.192
G00 Z0.10      (9 blocks)
      (intaglio cut #2)
G00 X0.000 Y1.420 Z0.100
G01 X0.010 Y1.390 Z-0.273 F60
G01 X0.020 Y1.340 Z-0.260
G01 X0.040 Y1.290 Z-0.254
G01 X0.060 Y1.240 Z-0.210
G01 X0.070 Y1.190 Z-0.197
G01 X0.090 Y1.140
G01 X0.110 Y1.090 Z-0.203
G01 X0.120 Y1.040 Z-0.197
G01 X0.140 Y0.990 Z-0.238
G01 X0.160 Y0.940 Z-0.230
G01 X0.170 Y0.890 Z-0.249
G01 X0.190 Y0.840 Z-0.260
G01 X0.210 Y0.790 Z-0.183
G01 X0.220 Y0.740 Z-0.189
G01 X0.240 Y0.690 Z-0.197
G01 X0.260 Y0.640 Z-0.187
G01 X0.270 Y0.590 Z-0.196
G01 X0.290 Y0.540 Z-0.205
G01 X0.310 Y0.490
...
```


Step 2. Cutting the Block

The G-code is sent to the CNC milling machine. In this case, a test plate executed on $\frac{1}{2}$ " MDF panels.

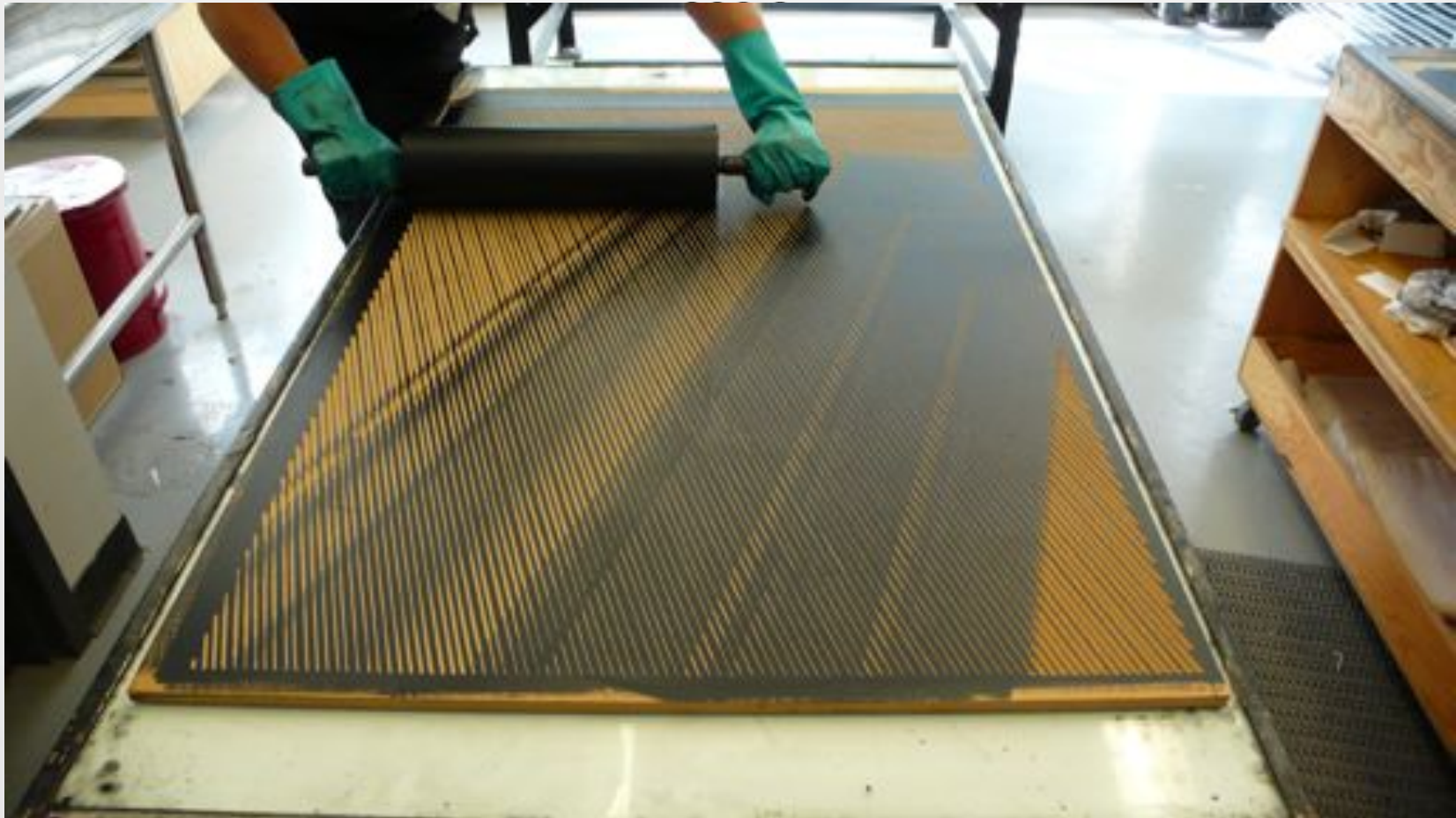




The freshly cut MDF plates are prepared for printing by removing milling dust with compressed air and dry brush. Then the MDF panels are sealed with polyurethane.

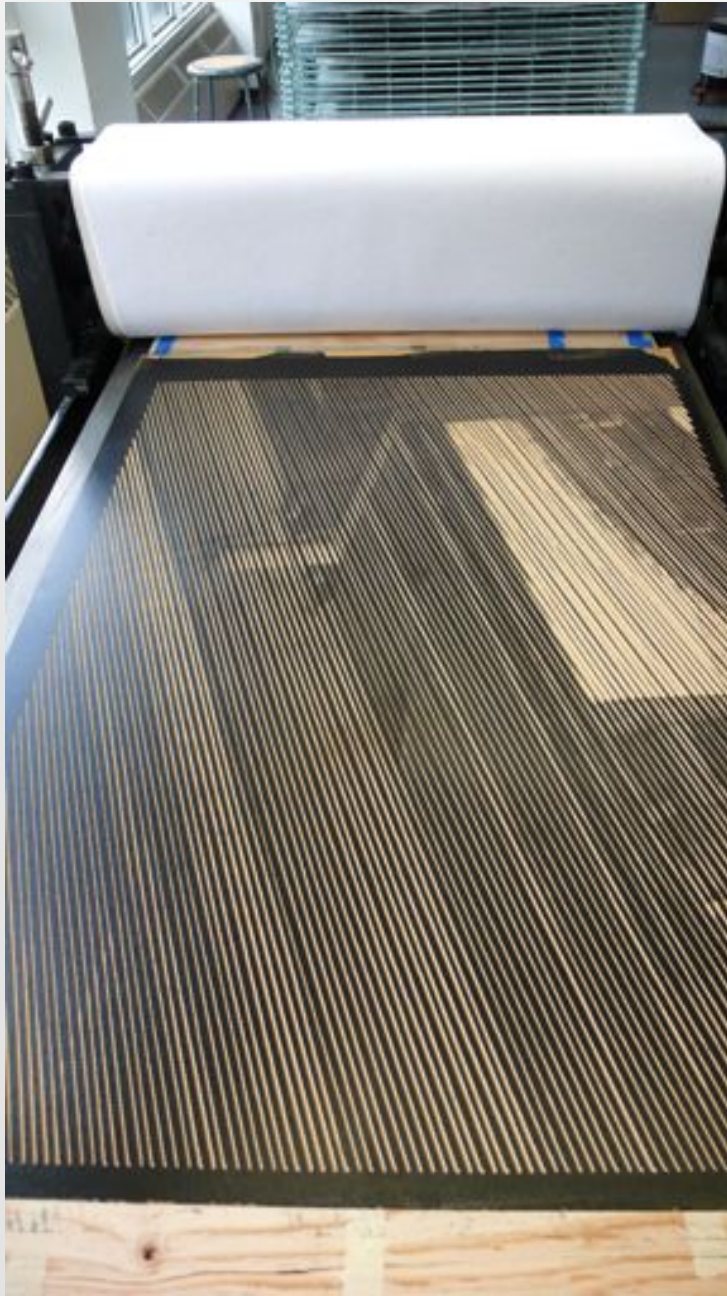
Step 3. Printing

The woodcut blocks are rolled up with relief printing ink in preparation for printing onto cotton fibre paper on an etching press.





Detail of inked woodcut block

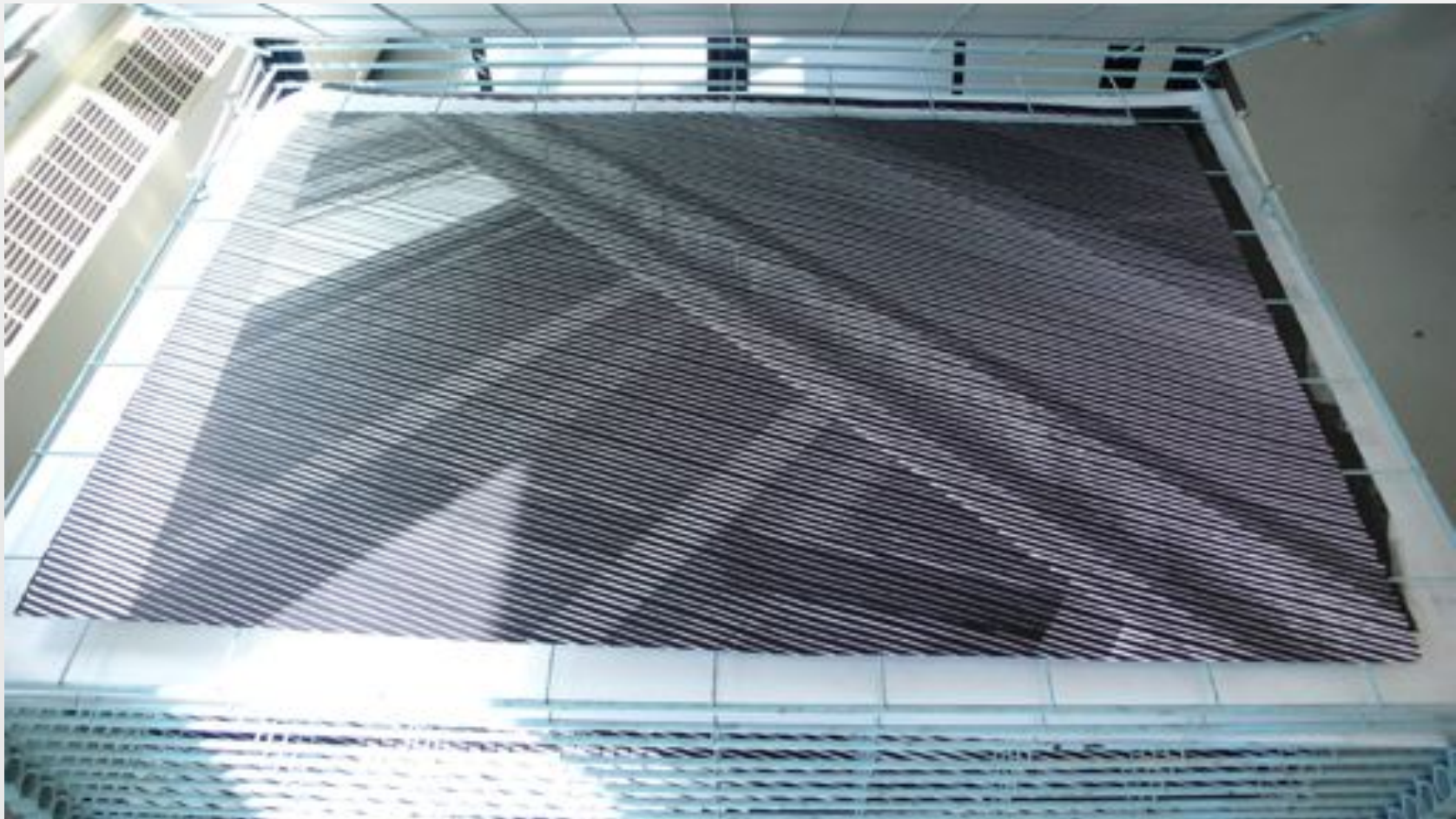


Cleaning out small imperfections

Plate on press ready to print

Running the plate through the etching press





Freshly pulled print on the drying rack



Triumphal Arch (Class II), 2012

Finally, when all the woodcut blocks in the tiled image have been printed, the work is 'pinned-up' in the studio for evaluation.