

samila

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Command line utility should compile (MacOS and Linux) as

```
cc -o samila samila.c -lm
```

Code has no external dependencies.

Command line, typing samila with no command line arguments

```
Usage: samila [options] f1 f2
  f1, f2    Function identifier from 1 to 49
            Specify either as 0 to choose a random function
Options
  -resx n   Number of samples in x direction, default: 10000
  -resy n   Number of samples in y direction, default: 10000
  -s n      Set the random number seed, default: 12345
  -o        Save OBJ file, default: off
  -d        Save DXF file, default: off
  -r        Rectangular mapping, default: polar
```

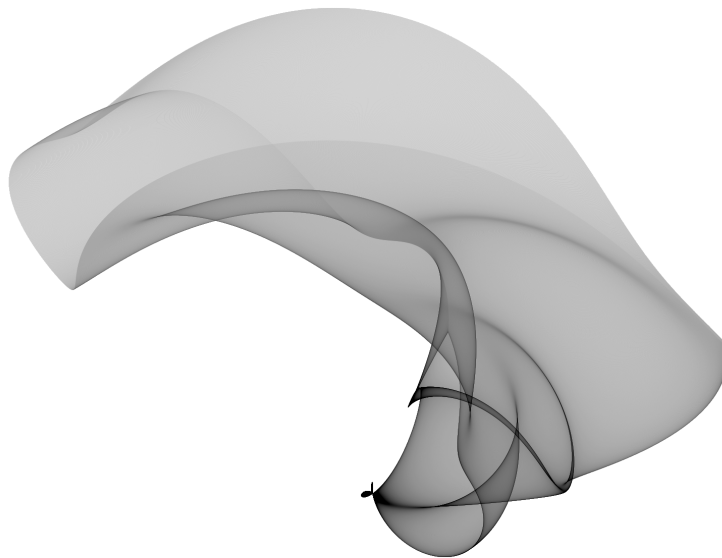
So, simplest operation would be

```
samila 3 4
```

This will create a 16 bit raw image called

```
polar_12345_3_4.raw
```

looking like the following (assuming the random number generator gives the same sequence as the computer I used).

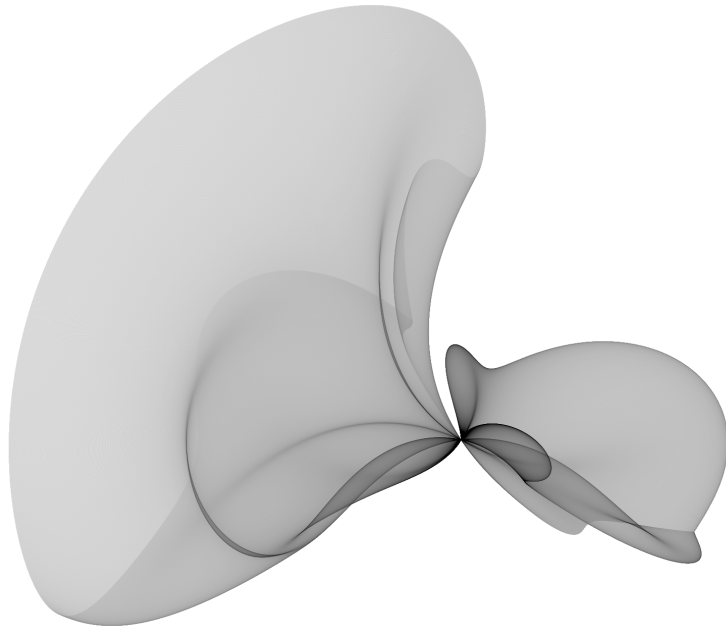


I use PhotoShop to open this, dimensions 1500x1500, 1 channel, 16 bits, PC byte order.
Typically one will need to change the levels.

To use a different seed

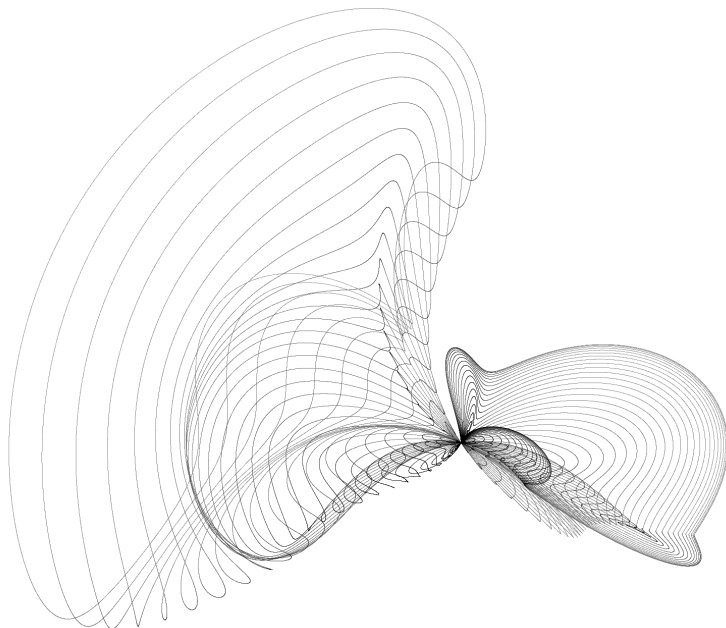
```
samila -s 7111 3 4
```

The files created will contain the seed and two function ids in the filename, this is enough to recreate the image. The filename starts with either “rect” or “polar” to indicate the mapping type.

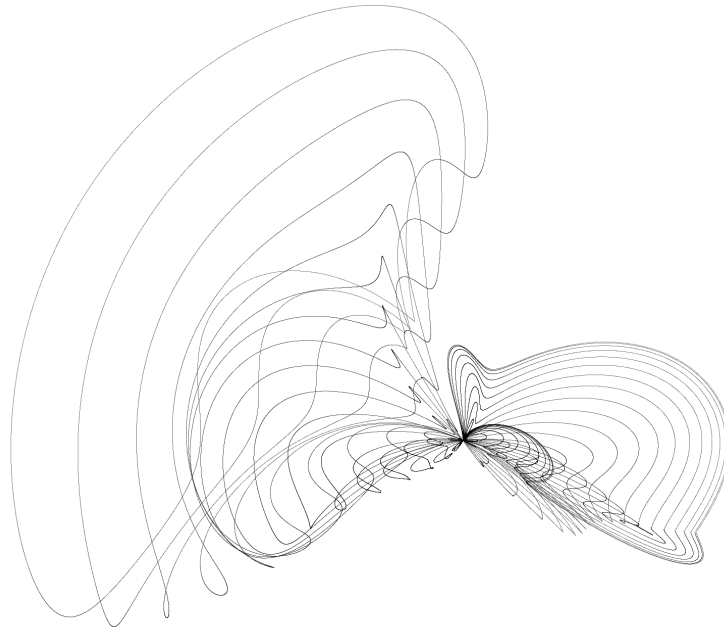


The example here samples the range of $-\pi$ to π in both directions by 10,000 samples. It is the degree of sampling that determine how smooth the image is. Typically, fast exploration might use a 5000x5000 sampling and a very high quality result with 20,000x20,000 samples. Noting that the time to complete is proportional the product of resx and resy.

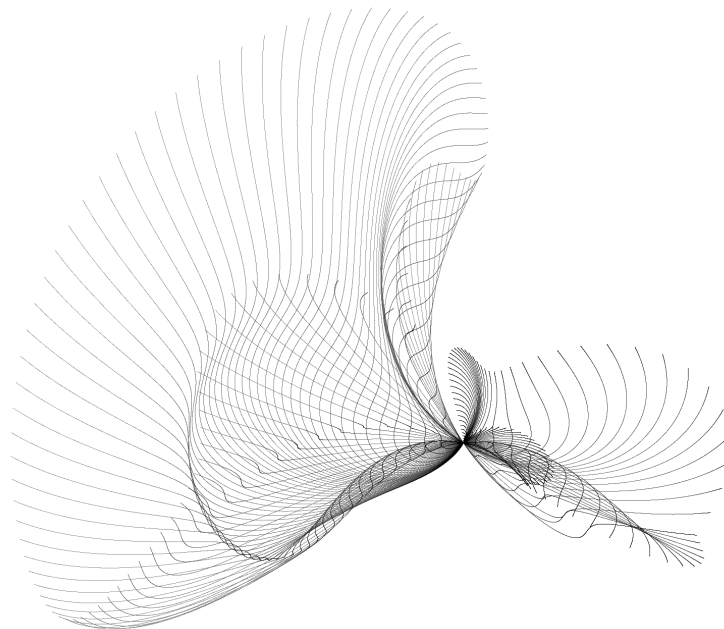
To create the "contoured" look, one of resx or resy should be reduced, for example
samila -s 7111 -resx 10000 -resy 100 3 4
This will sample the x axis in small steps, but only 100 samples in the y axis.



The spacing of the contour lines above can be changed with `-resy`, for example
`samila -s 7111 -resx 10000 -resy 50 3 4`



To create contours running the other direction
`samila -s 7111 -resy 10000 -resx 100 3 4`



To use a random function for either `f1` or `f2`, then enter a function id that is out of range. For example
`samila 0 5`
will choose a random function id for `f1`.
`samila 0 0`
will choose a random function id for both `f1` and `f2`.

To create obj and dxf files

```
samila -s 7111 -resy 10000 -resx 100 -o -d 3 4
```

This output has been specifically designed for a laser engraver. As such some effort has been made to create points along the contour paths that are equally spaced (at the desired point diameter) and do not contain coincident points.

Be careful not to create obj and dxf file with a high value for the smallest of resx and resy. This will result in large and probably unusable obj or dxf files.

Typically the high value can be higher than 10000 to avoid gaps, the points are filtered so will not contain coincident points.