Drawing Mode

All String Art images are *continuously-drawn* thus the image can be drawn as a connected set of lines from start to finish without interruption. Each of the four drawing options are useful in showcasing how a given static image was created.

Basics. The *Drawing Mode* module is shown to the right. The dropdown menu shows one static and four drawing modes.

- No Drawing (default)
1. Fixed Count Line Drawing (FCLD)
2. Fixed Count Fading Line Drawing (FCFLD)
3. Single Line Drawing (SLD)
4. Single Lines Overlaid Drawing (SLOD)

Additionally, *Drawn Lines* (DL) and *Drawing Speed* (DS) are parameters that can be adjusted just like *n*, *S*, and *P*.

Buttons allow you to *Pause* drawing (or resume *Play*), and *Step Back or Step Forward* the drawing one step at a time. Drawing progress (DP) notes the **start** of the DL lines. Initial values are DL = 3, DS = 3, and *Pause/Play* is set on *Play*.

Common instructions. If you want to show the first DL lines without having them move once you request any of the four drawing modes, start by depressing *Pause/Play*. If you want to get an initial view of how the image was drawn, it is worthwhile to simply start with FCLD and adjust DS up or down based on the number of lines in the image. You need not let the image complete its drawing cycle. You can interrupt drawing by changing modes. Changing modes resets DP to 0.

About FCLD and FCFLD. Both modes add DL lines at a time starting at 0 to all lines previously drawn. Total lines drawn is thus DL, 2DL, 3DL, …, until the full image is visible. (For example, you will see this 147 line spinning needle star emerge as 7 discrete cycles if you set DL = 21, but if you set DL = 2 or 1 and increase DS accordingly, you will see the image emerge as more of a spinning needle creating the spinning needle star.)

These two drawing modes do not adjust as parameters change, lines are FIXED. Additionally, the DL "footprint" does not change for the first two modes (so that if you move from DL = 3 to DL = 2 with *Pause* on, it will look like there are 3 lines, even though the image will only proceed 2 at a time. On the other hand, changing DL from 3 to 4 will add a line as the footprint has expanded. Similarly, *Step Back* is not visible but *Step Forward* does show forward movement. It is worthwhile to use these modes once you have decided on an image you want to watch get drawn.

FCLD. As noted above, this produces completed images and is typically your starting (and ending) point.

FCFLD. FCFLD is useful if the image has densely packed lines. Compare this 2133-line DL = 3 image in FCLD and FCFLD. This pulsing triangular ↻ one-time around image is harder to see after the first third is completed in FCLD than FCFLD. This is very much like a ticking-clock image if clocks had 79 seconds in a minute.

About SLD and SLOD. The last two drawing modes move as the parameters change and, as a result, they are particularly useful for determining attributes of an image. They also help in analyzing images like in examples one, two, and three.

SLD. Both SLD and SLOD maintain DL lines. As a new line is added to the sequence of DL lines, the first line in the sequence is removed maintaining DL lines in both modes. For example, set DL = 7 and see three shape-shifting triangles in SLD to see how the three triangles change and rotate based on 7 lines. See the image drawn in FCLD. Read more here.

SLOD. Use this to find images which have properties you are interested in showcasing. For example, click *Toggle Subdivisions* on and you can see that the first line ends at a subdivision that is as close as you can get to the top in this image which is surprisingly simple given that there are 1817 lines, but note how small each line is as a result. Once you see this, set DL = 23 and watch the image emerge in 79 cycles using FCLD. Change *P* = 962 and note that the image is single-step at DL = 6 and is an example of a ↻ one-time around image that can also be viewed using DL = 23.

Strategies for finding a satisfying DL. Often you will find it beneficial to use multiple modes. A typical strategy is to simply adjust DS and watch the image get drawn in FCLD. One useful starting point is DL = *S*/GCD(*S*,*P*) so you can see a cycle (this was the strategy discussed above with the spinning needle star). Sometimes a sub-images emerge like this single-step rotating pentagram in this image (set DL = 5, not DL = 11 = *S*). For porcupines, set DL = 2 like this bird beak.