

# IlliFrac

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## Abstract

Through the use of iterated functions, geometric fractals can be generated by repeating a base element according to a specific rule or through the use of an attractor function on a point. Thus, these fractals become a perfect method for exploring and explaining the behavior of iterated function systems.

The goal for our project is to demonstrate the process of iteration and recursion through the construction of geometric fractals such as the Sierpinski Triangle, Carpet, and Tetrahedron as well as the Menger Sponge. One method of demonstrating this is through a slowed down generation of each fractal which allows the user to view the order in which each base element is placed. Another method is to do the same but with the attractor function for the Sierpinski Triangle by showing each point as it is plotted and assign a color to it based on the random vertex that was used for its iteration.

**Progress** Our current progress includes Rohan's 2D recursion program for the Sierpinski Triangle and Carpet which now has a a delay between the drawing of each base element that is proportional to the number of total iterations being drawn. Sean is looking into converting this program into szg and becoming familiar with Aszgard so that we can eventually have it running in the Cube. Jon has written a python program for drawing the Sierpinski Triangle using the Barnsley IFS approach that color codes the points by which vertex was used to determine its position.

**Timeline** Rohan will continue to refine the algorithms while Sean ports his Java program to C++/OpenGL by the end of next weekend. Jon will finish the Python program by Friday, November 12 so that the points will be shown in real time or begin porting the program to C if this is not possible in Python.